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FOSTERING ENTREPRENEURSHIP ON CAMPUS -- CASE VAMK

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ABSTRACT

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This thesis uses VAMK as a case to recognize the intervenable factors on a university campus that foster entrepreneurship among students, how these factors create an impact on students' entrepreneurial behavior, and how the current situation is regarding VAMK's engagement with these factors in entrepreneurship promotion from the students' perspectives. The thesis takes the background profiles, needs and expectations of the students in VAMK into consideration in order to map out the possible gaps between students' expectations and experiences regarding how entrepreneurship has been fostered in VAMK. In the end, this thesis seeks improvement suggestions and identifies the best practices by constructing an operational model for VAMK to foster entrepreneurship.

This thesis bases the model construction and survey design on the relevant entrepreneurship theories and findings from previous researches on universities and entrepreneurship. A quantitative research approach was adopted in this research.

Four factors that are important for students' potential entrepreneurial behaviors are identified for the model - the first factor is the core mental and psychological factor, the second factor is entrepreneurial competence, the third factor is entrepreneurial experience and the fourth factor is resource and support provided by VAMK.

Out of the four factors, entrepreneurial competence is the most important factor needed for students to perform entrepreneurial tasks. Male and female students consider the importance of the four factors for initiating their entrepreneurial behavior differently. Female students might need more support in building entrepreneurial competence. The factor of entrepreneurial experience seems to be much more important to the students from the school of health care and social services than from other study units. The factors of entrepreneurial competence, experience, and resource/support seem to be much more important to the students with strong entrepreneurial personality.

In general, VAMK's performance in fostering entrepreneurship seems to be on a middle level, meaning that VAMK would need to improve all areas regarding fostering entrepreneurship. Although its impact on the students' attitude and self-efficacy towards entrepreneurship are meeting the students' expectations, significant

gaps for improvement have been identified in regards to students' perception of entrepreneurship, their motivation for entrepreneurship, entrepreneurial competence and experience, as well as resource/support provided in VAMK. In particular, resource/support turns out to be the area that has the biggest gap between reality and expectation, and hence, one of the most critical areas for improvement.

This thesis contributes to the research of fostering entrepreneurship in universities by extending the range and the depth of the previous studies of VAMK. The results are only applicable to VAMK with a limited valid time frame, but the methodology could be reused on VAMK and other AMKs in future research for follow-ups or exploration regarding fostering entrepreneurship on campus. A larger sample size representing the population structure could have improved higher reliability and validity of this thesis.

Keywords Entrepreneurship, fostering, factors, students' profile, improvement, model, campus, entrepreneurial university, VAMK

CONTENTS

ABSTRACT
1 INTRODUCTION 10
1.1 Topic Introduction 10
1.2 Case VAMK Background 14
1.3 Aim and Focus of the Thesis 18
1.4 Structure of the Thesis 20
1.5 Restrictions and Limitations 20
2 LITERATURE REVIEW AND EARLIER RESEARCHES 21
2.1 Entrepreneurship Theories 21
2.2 University and Entrepreneurship 34
3 MODEL DEVELOPMENT 43
4 METHODOLOGY 46
4.1 Quantitative Approach 46
4.2 Questionnaire Design 46
4.3 Target Group Selection and Data Collection 47
4.4 Data Analysis 48
5 RESULT AND DISCUSSION 51
5.1 Profiles of Students in VAMK and Their Orientation towards Entrepreneurship 51
5.2 Fostering Factors for Entrepreneurship 64
5.3 Evaluation of VAMK's Situation from Students' Perspectives 84
5.4 Improvement for Entrepreneurship-Fostering Practice in VAMK 86
6 CONCLUSION 88
6.1 Overview, Reliability and Validity 88
6.2 Practical Implication - Students' Profile and Their Orientation to Entrepreneurship 89
6.3 Practical Implication - Entrepreneurship-fostering Factors on Campus 91
6.4 Practical Implication - Evaluation, Gaps and Improvement 92
7 FURTHER RESEARCH RECOMMENDATIONS 95
REFERENCES 96

APPENDICES

LIST OF FIGURES

Figure 1. Operational Model for Fostering Entrepreneurship on Campus 43
Figure 2. Histogram of personality. 50
Figure 3. Profile of the 8 aspects of entrepreneurial personality from the sample. 52
Figure 4. Profile of the 8 aspects of entrepreneurial personality from the sample grouped by strength of binned personality. 52
Figure 5. The association between entrepreneurial intention and entrepreneurial experience. 55
Figure 6. The association between entrepreneurial intention and influence of role model in an active way. 56
Figure 7. The association between entrepreneurial intention and self-efficacy. 57
Figure 8. The association between entrepreneurial intention and learning intention. 58
Figure 9. The association between entrepreneurial intention and strength of entrepreneurial personality. 59
Figure 10. The association between learning intention and entrepreneurial experience. 60
Figure 11. The association between entrepreneurial culture in growth environment and strength of entrepreneurial personality. 61
Figure 12. The association between strength of entrepreneurial personality and influence of role model in an active way. 62
Figure 13. Profile of students' perception on entrepreneurship. 64
Figure 14. Means of the 4 extracted factors. 73
Figure 15. Means of the 4 extracted factors by gender. 76
Figure 16. Means of the 4 extracted factors by study unit. 82
Figure 17. Means of the 4 extracted factors by strength of entrepreneurial personality 83
Figure 18. Customized model on fostering entrepreneurship with detailed elements listed for VAMK. 94

LIST OF TABLES

Table 1. Frequency summary of personality_binned. 50
Table 2. Chi-square independence test in the Crosstable between entrepreneurial intention, learning intention, binned personality and other variables under the students' profile. 54
Table 3. Students' orientation towards entrepreneurship. 63
Table 4. Communalities of retained items in the fourth round of extraction. 65
Table 5. The KMO and Bartlett's measures 66
Table 6. Cumulative variance explained. 66
Table 7. Factor loadings in pattern matrix. 67
Table 8. Cronbach's alpha coefficient and factor correlation matrix 68
Table 9. Descriptive statistics of the composite variables for entrepreneurship fostering factors. 68
Table 10. Mauchly's test of Sphericity for the items loaded to each extracted factor ... 69
Table 11. ANOVA results for the items loaded to each extracted factor 69
Table 12. Post hoc tests among items loaded to core factor. 70
Table 13. Post hoc tests among items loaded to competence factor. 70
Table 14. Post hoc tests among items loaded to experience factor. 71
Table 15. Post hoc tests among items loaded to resource and support factor. 71
Table 16. Mauchly's test of Sphericity for the extracted factors 72
Table 17. ANOVA results for the extracted factors 72
Table 18. Post hoc tests among extracted factors. 72
Table 19. Test of interaction effects of variables from students' profile on the extracted factors 74
Table 20. ANOVA results for the extracted factors separately run by gender 75
Table 21. Post hoc tests among extracted factors separately run by gender 75
Table 22. Factorial ANOVA results for the extracted factors 78
Table 23. Post hoc tests based on the factorial ANOVA results for the extracted factors 78
Table 24. ANOVA results for the relevant extracted factors grouped by entrepreneurial personality and study unit 79

Table 25. Welch test results for the relevant extracted factors grouped by entrepreneurial personality and study unit 80
Table 26. Post hoc tests among different entrepreneurial personality subgroups for the relevant extracted factors 81
Table 27. Post hoc tests among different study unit subgroups for experience factor ... 81
Table 28. Descriptive statistics of the evaluations on how VAMK has been fostering entrepreneurship from students' perspectives 85
Table 29. ANOVA results of comparing the "need" and the "evaluation" of entrepreneurship fostering factors 85

LIST OF APPENDICES

APPENDIX 1. Sample characteristics - Demographic 113
APPENDIX 2. Sample characteristics – Culture and Influence..... 114
APPENDIX 3. Sample characteristics – Personality (with value "Yes") 114
APPENDIX 4. Sample characteristics – Needs and Expectations 115
APPENDIX 5. Descriptive statistics of variables measuring entrepreneurship fostering factors 116
APPENDIX 6. Descriptive statistics of variables on evaluation of VAMK's environment 116
APPENDIX 7. Survey questionnaire 117

1 INTRODUCTION

This section provides an introduction of entrepreneurship as a concept and topic of this thesis, as well as the background of VAMK as the case; it then describes the aim, focus, and structure of this thesis; and finally, the restrictions and limitations of this thesis are also highlighted.

1.1 Topic Introduction

Entrepreneurship is a dynamic topic that evolves through time and an important phenomenon to the society and economy. There has been many different definitions of entrepreneurship in literature, for example:

- buying at a low price and selling at an uncertain price, trying to profit from speculation (Cantillon 1755);
- the actives in making new combinations (such as introducing a new product or new way of production, developing a new market, discovering a new source of material supply, setting up a new organization in the industry) (Schumpeter 1934);
- the pursuit of opportunity despite of the situation whether resource is currently in control (Krueger & Brazeal 1994, 91);
- the process of identifying and exploiting profitable opportunities (Shane and Venkataraman 2000)
- " the ability to take the initiative to organize a new enterprise" (Etzkowitz 2003, 111);
- "a process of value creation and appropriation led by entrepreneurs in an uncertain environment" (Mishra & Zachary 2014).

According to the above definitions, the elements of entrepreneurship have evolved to include seeking opportunity, proactiveness, taking risks, innovation, firm will, competence to drive actions, and gaining reward. While reward is usually the direct result of successful entrepreneurial activities and goes to the entrepreneurs, it is not the only value of entrepreneurship. Entrepreneurship has more to offer and the entrepreneurs are not the only beneficiaries.

Entrepreneurship is important both to the society and economy. First, entrepreneurial activity supports to meet some important societal demands, such as improving life quality (Zahra, Rawhouser, Bhawe, Neubaum & Hayton 2008), advancing human welfare and building sustainable development (Wilson, Vyakarnam, Volkmann, Mariotti, & Rabuzzi 2009), increasing philanthropy (Isenberg 2011), and reducing reliance on natural resources (Sine & Lee 2009). Second and more importantly, it is widely accepted that entrepreneurial activity is a significant determinant of economic development and growth (Schumpeter 1934; Birch 1987; Mazzarol, Volery, Doss & Thein 1999; Baumol & Strom 2007) and it is mentioned as the backbone of a country's economy (Piperopoulos & Piperopoulos 2009). It contributes to economic growth by introducing innovations, fostering competition and creating employment (Wennekers & Thurik 1999; Carree & Thurik 2005; Wong, Ho & Autio 2005; Caloghirou & Protogerou 2015; Van Praag & Versloot 2007; Edwards 2011). There has been findings showing how entrepreneurship increases employment and income generation, promotes innovation and a more balanced economic and social structure (Heinonen & Poikkijoki 2006). In reality, for example in Europe, its economic growth is depending on entrepreneurial activity heavily (Feki and Mnif 2016; Wilson 2008) and both EU member states and pre-accession counties have defined the development and promotion of entrepreneurship as one of the strategic goals of their policies (European Commission 2007).

In Finland, the importance of entrepreneurship can be indicated from several aspects. First of all, due to the fact that large companies are almost constantly reducing the number of employees and that the big retirement wave of Finnish entrepreneurs in the coming years could lead to the closure of lots of companies in the worst case as not all retiring entrepreneurs could find a successor in their own families and it is not easy for less competitive companies to find a buyer, entrepreneurship is seen as a critical solution to reduce unemployment in Finland and fostering entrepreneurship will meet the urgent societal demand of new entrepreneurial generation (Paajanen 2006, 15; Ristimäki 1998, 11). Moreover, the Finnish policymakers suggested entrepreneurship as a solution to economic difficulties in the 1990s (Erkkilä 2000), and during the 2000s the government implemented the Entrepreneurship Policy Program as part of its economic and business policy (Valtioneu-

vosto 2005). In particular, the latter emphasizes the importance of companies and entrepreneurs as builders of economic growth and employment, and focus on practices that support entrepreneurship (Valtioneuvosto 2005).

Since entrepreneurship is of societal and economic importance and there is a demand for more and the next generation of entrepreneurs, how it could be fostered? One of the many efficient and effective ways to do it is to increase the supply of entrepreneurs and individuals with entrepreneurial competence through university campus. Hamilton and Harper (1994) suggested that the importance of the supply of entrepreneurs to economic development should be emphasized by having "enough of them together in the same place at the same time". This thesis suggests that “the same place” would be the university and “the same time” would be the time individuals spend on higher education in the university. This idea derives from the fact that some aspects of entrepreneurship can be taught (Autio, Keeley, Klofsten, GC Parker & Hay 2001; Johnson, Craig & Hildebrand 2006; Vesper & Gartner 1997), the triple helix model and the third mission of universities.

Drucker (1985) claimed that entrepreneurship is a discipline and it can be learned. Gorman, Hanlon and King (1997) found that many empirical studies indicate that entrepreneurship can be taught, or at least motivated, by entrepreneurship education. Raichaudhur (2005) argued that the process of entrepreneurial education is validated by the majority of empirical findings as effective in teaching entrepreneurial aspiration and success via suitable education programs, indicating the impact of education on the cultivation of future entrepreneurs (Hidayat & Andri 2017). In fact, there has been findings suggesting that educational interventions on entrepreneurship are very likely to have a positive impact on the actual business start-up rates in the long run (Kasturiratne, Lean & Phippen 2012). Since students are a promising source for the next generation of entrepreneurs (Lüthje & Franke 2003), it would be rather reasonable and feasible for a university to provide entrepreneurship education to students in the hope that part of the students will become entrepreneurs at some point in their life and thus maintain the societal and economic benefit from the entrepreneurship. Furthermore, Gibb (2002) argued that entrepreneurship training and development should cover all individuals (not only business students) because students receiving entrepreneurship education are 3 times more likely to start their own businesses or to be self-employed, have 27 percent higher annual incomes,

possess 62 percent more assets, and are more satisfied with their jobs (Charney & Libecap 2000).

Universities could teach entrepreneurship, which is actually a major part of what is required in regard to fostering entrepreneurship. The triple helix model suggests that the collaboration between university (U), industry (I) and government (G) is the critical foundation of the creation and/or development of incubator activities for entrepreneurship in knowledge-based societies (Etzkowitz & Zhou 2006). In this U-I-G framework, each helix (institution) relates to one another to create an overlay of communication, networks, and organizations, and drives in a common direction to stimulate and sustain the entrepreneurship development. Each of the helices can take the role of the other (Etzkowitz & Leydesdorff 2000). For example, the university can assume the function of industry in providing business experience and incubator services for start-up companies. The government can assume the function of industry in offering initial funding for early-stage entrepreneurs. The industry can assume the function of the university in arranging training programs and seminars for entrepreneurs. While the triple helix model emphasizes the U-I-G interaction, it implies that the university, on its own, is a vital contributor and possesses specific functions and missions in fostering entrepreneurship.

Universities initially have teaching as the main mission, gradually adopts research as an important scientific knowledge generation and innovation transfer function (Wright, Clarysse, Lockett & Knockaert 2008), and in recent years, the idea of universities' “third mission” has emerged - to facilitate economic development and societal welfare (Etzkowitz, Webster, Gebhardt & Terra 2000). The third mission is the society’s new expectation on what universities have to do, and it has been interpreted in different ways, one of which is to foster entrepreneurship (Hofer, Potter, Redford & Stolt 2013). In fact, Hofer et al (2013) claimed that fostering Entrepreneurship is very likely the best linkage among the three missions of universities. While entrepreneurship contributes to economic and societal development as mentioned above, “higher education is essential to national, social, and economic development” too (The World Bank 2000). “Higher education and entrepreneurship are seen by researchers, policy makers (…) as two societal institutions crucial to economic growth, job creation, and increased standards of living” (Miller & Acs 2017). Universities have to fulfill all the three missions, and especially in regard to the third mission, it can be achieved by fostering entrepreneurship such as including and

stressing entrepreneurship as an important part in its higher education and other activities and operations.

In addition to that universities could, should and would need to foster entrepreneurship, there are other justifications on why it is also proper to do it in universities. For example, young people usually start to plan their own careers in universities and they tend to have more new business ideas, so they need to be encouraged to view entrepreneurship as a potential and suitable option for them and to translate the ideas into business (Römer-Paakkanen 2006); in universities students can take time to build the necessary confidence to take risks from the trial experiences, be it successes or failures (Wilson et al. 2009); universities can provide unique protective environments for nascent entrepreneurs (Hofer et al. 2013); more customized supporting practice can be offered in universities to the future entrepreneurs during the initial stages of starting a business (Hofer & Potter 2010); there has been positive evidence of the impact that entrepreneurship education has on new ventures and jobs creation (Garavan & O'Cinneide 1994). In all, universities act as a critical role in fostering entrepreneurship due to its capability, responsibility and suitability.

1.2 Case VAMK Background

Vaasa University of Applied Sciences, VAMK, started its operations as a temporary university of applied sciences on 1 August 1996 in Vaasa, a west-coast city of Finland. It was a result from the merge of five educational institutions (VAMK 2022a). There are approximately 3,250 students and 200 employees (VAMK 2022b). Multidisciplinarity, multilingualism and internationality have been recognized as VAMK's strengths (VAMK 2022a). For example, there are 10 Finnish-language and 2 English-language courses from three different areas of technology, business, and social and health care that lead to a bachelor's degree (VAMK 2022c); and currently, VAMK has students from 45 different countries thanks to its partnership programs with a number of cities abroad and its students develop expertise in their fields in a multicultural environment because of international studies and various international events and projects in VAMK, as well as foreign guest lecturers from its partner universities (VAMK 2022d).

VAMK's vision is to be a "main partner in expertise", with the mission to "create a competitive edge for key players in the business sector by coaching future talent and providing

a pioneering perspective", embracing the values of sympathetic, pioneering, customer-driven and openness. Its ambition is to be a creative and most important partner in competence, and a link between the world of work and students by providing "education and continuous learning in wide-ranging networks". It promotes "skills and know-how as well as development work that is based on the needs of the world of work", and assumes the responsibility of engaging in "regional development and applied research, development and innovation activities that renew the region's economic structure". With enthusiasm, innovation, courage and the ability to solve, VAMK works on its operation quality and active cooperation with working life to create societal impact by fulfilling its three tasks – teaching, research and regional development. (VAMK 2022e, 2022f.)

VAMK is chosen as the case for this thesis for several reasons. Firstly, VAMK is one of the key players in providing graduates with competence in Finland and it is in active collaboration with working life, VAMK can serve as a typical model university and by studying VAMK it may provide a significant implication of improvement or best practice on fostering entrepreneurship, which can be useful or of reference for other universities in Finland. Secondly, the internationality feature of VAMK's students makes it an interesting research subject as the background profiles, demands and interests of the students will be taken into consideration in this thesis by conducting some comparisons on the possible difference. Thirdly, data collection is relatively easy as the target group – students in VAMK – is accessible to the author. Fourthly, it is the author's own motivation to provide feedback and possible improvement suggestion to VAMK regarding fostering entrepreneurship as the author is a student of VAMK and has been interested in the entrepreneurship-related courses provided by VAMK and how the teaching/learning activities can result in any real impact. Last but not least, earlier studies on entrepreneurship topic related to VAMK have some limitations, but at the same time also provide some inspiration for further research. As the earlier studies were conducted more than ten years ago, the educational environment and content might have evolved and it would be worth of reviewing the situation in VAMK.

But how has VAMK been fostering entrepreneurship by far? According to the Finnish government's Entrepreneurship Policy Program (Valtioneuvosto 2005), entrepreneurship will be promoted at various levels of education and highlighted as a career option, and the needs of small and mid-size enterprises will be taken into account in education policy

projects, entrepreneurship training and counseling will pay special attention to supporting first-time entrepreneurs and improving apprenticeship opportunities. Entrepreneurship education, business advice and support, establishment, growth and internationalization of business start-ups are some of the main agendas in this program. Also, the Entrepreneurship Strategy prepared by ARENE ry (Rectors' Council of Polytechnics) (2006) has described that the entrepreneurship goals of polytechnics are to grow successful entrepreneurs from students, that the implementation of promoting entrepreneurship is the responsibility of all polytechnics and that students with a genuine interest in entrepreneurship must be actively guided to entrepreneurship. Following these initiatives, VAMK has aimed to create societal engagement and impact via RDI (Research, development and innovation), education and cooperation with external parties (VAMK 2022g). Especially, arranging conferences and events, RDI activities, alumni activities, project participation of enterprises, co-creating information and competence with partners, increasing the number of student enterprises, and offering flexible and practical study paths are some of the most relevant measures that VAMK has included in its strategy to foster entrepreneurship (VAMK 2022g). In practice, VAMK has been emphasizing the importance of entrepreneurship by including entrepreneurship as a common part of all teaching units (VAMK 2006). In particular, its pedagogical solutions are intended to support the students in the Business Administration unit to acquire skills needed for entrepreneurship and to encourage them in transforming into entrepreneurs (Brink 2008). Specifically, a reform project was implemented in the business administration unit of VAMK in 2006, where an entrepreneurship study program was formed by 24 credits of relevant courses and a joint project work, and integrated into the first-year study module for the unit's students (Brink 2008). The expected outcome of this entrepreneurship study program is that students would develop into individuals who master the basics of being an entrepreneur and have good learning and development skills, and whose professional growth continues as an entrepreneur. Four teaching methods have been adopted in the entrepreneurship study program - traditional, participatory, work-based and simulation methods (Brink 2008).

A study was conducted in 2007 to evaluate the impact of this program in order to develop the education methods to better support students in the process of growing into an entrepreneur. It was found out that around one third of the students who responded to the survey had the intention to be an entrepreneur; and the attitude towards entrepreneurship of

around one third of them had become positive after the study program; around two third of them were confident in their own entrepreneurial ability and believed it could be possible for them to become an entrepreneur; and the most common motives for entrepreneurship are desire and determination to try, freedom and prosperity (Brink 2008). Regarding the learning environment, a change in study culture seems to be more difficult than reforming the teaching, as the students were used to traditional lecture-based arrangements rather than interactive approaches such as teamwork and collaborative learning (Brink 2008). In addition, there is another study on how the promotion of entrepreneurship is executed in VAMK. This study, conducted by Jylli (2009), revealed that students had raised interest in entrepreneurship and gained clear capability to start their own businesses after completing the entrepreneurship study program and their interpretation of entrepreneurship was to found own company, take risks and make decisions independently. It also showed that the way to promote entrepreneurship in VAMK has been mainly through the entrepreneurship study program and idea on improvement for the program was to have more entrepreneurs as role models visiting VAMK to provide practical advice and encourage students to be entrepreneurs.

Moreover, an examination of the career monitoring survey (Vipunen - opetushallinnon tilastopalvelu 2022) for students in VAMK which was conducted between 2018 to 2020 five years after their graduation indicates some facts related to their entrepreneurial abilities and behaviors:

1) Majority of the students from all study units believe that they have gained the ability to learn and adopt new things, development and networking skills at an excellent level.
2) Regarding business and entrepreneurship skills, only the majority of the students from the business administration unit are confident in their mastering level, and only a few students from other study units agree that their degrees have offered entrepreneurship skills though they are not confident in their level.
3) More students from the business administration unit have worked as an entrepreneur, self-employed, freelancer or light entrepreneur than the students from other study units, after graduation, although the amount of these students is only around 10% of the respondents of the business administration unit. But not all those who

tried entrepreneurship were fully focusing on it since part of them reserve entrepreneurship as an occasional activity, and most of them who tried entrepreneurship have stopped or only occasionally been practicing the entrepreneurial activities ever since, and have a regular job.

4) Less than 5 persons from business administration unit and Engineering and technology unit have been the establisher or a partner of more than 3 companies since graduation. But whether the reason for this has been due to failure or success of previous companies is not known. At least, it shows the perseverance of these people.
5) Not all of them tried entrepreneurship immediately after graduation. Among those who tried entrepreneurship, students from business administration unit and Engineering and technology unit seems to take time to prepare themselves before they practiced entrepreneurial activities, while students from other study units seem to start being an entrepreneur right after graduation but some of them quit after some time.

It seems that although there has been promotion of entrepreneurship among students who were mainly from business administration units and the outcome was relatively positive, there is more that VAMK should and would need to do to enhance the promotion, which could cover a wider range of its students and not only brings impact to the students during their time in the university but also after graduation, to create a profound and lasting effect from its missions.

1.3 Aim and Focus of the Thesis

Although both previous studies have provided very useful findings on the impact of the entrepreneurship study program and the career monitoring survey have shown interesting and recent facts about some relevant educational outcomes on entrepreneurship, there are some limitations. For example, both studies' target groups have been the same - the students from the Business Administration unit who have been the first batch to participate in the entrepreneurship study program in 2006 when it was initially established in VAMK, with one being conducted in 2007 right after the students completed the program and the other one in 2009 when the students were in their third year of study; both studies were qualitative which means quantitative data for possible comparison and correlation was

lacking so that it was not able to provide a more specific solution or model on operational level to improve the program going forward; the career monitoring survey did not examine the factors that might lead to those facts. On the other hand, both studies and the career monitoring survey serve as a solid foundation and provide interesting inspiration for further research on the same topic and the same case.

This thesis aims to extend the range and the depth of the previous researches by covering all the students in VAMK in the present time when the content, arrangement and pedagogical approach of the entrepreneurship study program might have evolved and so does the impact of the program probably, and by considering the impact of students' different background profiles, demands and interests on their real experience and outcome from how entrepreneurship has been fostered in VAMK, and by quantitatively studying the factors that foster entrepreneurship as a career option among students, based on which an operation model on how these factors can be worked with in VAMK will be drawn for further improvement. The focus of the thesis is to collect insight from the students' perspectives and provide suggestion based on the students' needs, and with the study on different factors, to explore the ways to foster entrepreneurship in VAMK beyond just entrepreneurial education. It includes four research questions:

- What are the background profiles of students in VAMK and their orientation towards entrepreneurship?
- What are the factors fostering entrepreneurship among students in VAMK and are there any differences in how much these factors are demanded for fostering the students' potential entrepreneurial behavior, considering their background profiles and expectations?
- How has VAMK been working with these factors to foster entrepreneurship – evaluated from the students' perspectives?
- What would be the possible gaps between students' expectations/needs and the experience related to fostering entrepreneurship among them? What could be the improvement for entrepreneurship-fostering practice in VAMK?

1.4 Structure of the Thesis

This thesis includes 7 parts. In the introduction, the topic of fostering entrepreneurship in university and its importance will be presented, the basic background of VAMK and how VAMK has been fostering entrepreneurship will be introduced, aim and focus as well as the restriction and limitation of this thesis will be clarified. In the literature review, relevant entrepreneurship-related theories will be presented and the earlier researches on entrepreneurial university and education will be synthesized, both of which will set up a solid foundation and a clear direction for the study in this thesis. In the factors and model development part, a preliminary model with entrepreneurship-fostering factors will be hypothesized. In the methodology part, the selected data collection method and analysis strategy will be explained and justified. The result will then be presented and followed by discussions to interpret the data and generate some findings. In the conclusion, the whole study process of this thesis will be reviewed and evaluated to assess the reliability and validity, an adjusted and customized model for improving the promotion of entrepreneurship will be suggested to VAMK and other relevant and significant implications will be documented. Last but not least, further research possibilities will be recommended.

1.5 Restrictions and Limitations

This thesis is restricted to studying VAMK as a case regarding the promotion of entrepreneurship in the current situation and the findings will be customized only for VAMK for the time being. Moreover, the thesis' limitation includes that the findings on how entrepreneurship has been fostered and how it could be improved are only from the perspective of VAMK's students, and that a quantitative method was applied mainly in the data analysis.

2 LITERATURE REVIEW AND EARLIER RESEARCHES

In this section, the relevant entrepreneurship theories will be reviewed and the important findings from previous researches on university and entrepreneurship will be presented. The content in this section serves as the theoretical framework of this thesis.

2.1 Entrepreneurship Theories

Entrepreneurship is multidisciplinary, there are multiple theories of entrepreneurship explaining the dynamics of this topic from different aspects with different weights, including economics, psychology, sociology, etc (Mishra et al. 2014). This implies that entrepreneurship should be understood and studied comprehensively and based on one's focus. The theories used in this thesis are selected with the focus on understanding entrepreneur's personal traits and the drive of entrepreneurial intention, how social-cultural context affects the supply of entrepreneurs, what entrepreneurship is all about, the entrepreneurship process and competence, and the journey of becoming an entrepreneur.

2.1.1 Entrepreneur's personal traits and the drive of entrepreneurial intention

What does it take to make an entrepreneur? To answer this question is, however, not easy. One of the important internal ingredients is a set of specific personal traits. Two essential personal traits of an entrepreneur are risk-taking propensity (Knight 1921) and high internal locus of control (Rotter 1966), both of which have been recognized to be important in fostering entrepreneurship (Crant 1996; Lüthje et al. 2003; Robinson, Huefner, & Hunt 1991). Brockhaus (1980) claimed risk-taking propensity as "the perceived probability of receiving the rewards associated with the success of a proposed situation". In other words, an individual with risk-taking propensity perceives that it is very possible for s/he to succeed in action and obtain the reward despite the uncertainty and hence decides that it is worth of trying. And Kaufmann, Welsh and Bushmarin (1995) claimed internal locus of control as the "personal belief that one has influence over outcomes through ability, effort, or skills". It implies that an individual with high internal locus of control believes that s/he is able to control and influence her/his destiny and is responsible for what happens to her/him. In fact, both of these two personal traits have been proved to have the strongest influence on one's entrepreneurial attitude (Zollo, Laudano, Ciappei & Zampi 2017).

Other personal traits of an entrepreneur, based on what Chell (2013) has listed after conducting a tremendous literature review, include:

- Creativity – Generate novel ideas and envision possibilities
- Alertness and spontaneous learning – Recognize opportunities and work out the means-end framework via self-directed learning of the needed knowledge
- Adeptness – Learn the "rules" and situations and make the right actions at the right time
- Resilience – Endure and cope with difficulties and don't give up trying easily
- Commitment – Set goals to be achieved by own efforts, go the extra miles and focus energy to create accomplishment

It is worth of notice that possessing the personal traits mentioned above will not always make one an entrepreneur, but an entrepreneur tends to possess these personal traits. It means that it is very possible and practical to identify potential entrepreneurs from individuals with these personal traits.

The other important ingredient of making one an entrepreneur is the drive of entrepreneurial intention which predicts entrepreneurial behavior. Thompson (2009, 671) defined entrepreneurial intention (EI) as "a conscious and planned resolve that drives actions necessary to launch a business". Hence, EI is widely accepted as a key role in the decision to start a business venture (Autio et al. 2001; Krueger Jr, Reilly & Carsrud 2000; Liñán & Chen 2009) and a valid predictor of actual entrepreneurial behavior (Bird 1988; Ferreira, Raposo, Rodrigues, Dinis & Do Paco 2012; Krueger & Carsrud 1993; Shapero & Sokol 1982). Motivation is believed to be the major driver of EI (Sitaridis & Kitsios 2019). Out of all the drives of entrepreneurial intention, two motivations are identified as the most common – external profit and internal need for achievement.

Profit maximization has been precepted as the motivation of entrepreneurship since the 18th century (Long 1983, 49). Cantillon (1755) claimed that entrepreneur buys at a low price and sells at an uncertain price, implying that entrepreneurship is simply trying to profit from speculation. Similarly, Kirzner (1973) described that the entrepreneur buys goods at lower prices and sells at higher prices, driven by profitable opportunities in the

market. Also, there has been a positive correlation between expected reward and the supply of entrepreneurship, as indicated by Casson's (1982, 336).

On the other hand, McClelland (1961, 233-237) identified the need for achievement (or n Ach) as the essential motivation for entrepreneurship, which is driven by different psychological factors that produce entrepreneurial personalities. In other words, individuals with entrepreneur's personal traits tend to have the need for achievement which can lead to the formation of entrepreneurial intention and eventually result in entrepreneurial behavior. In particular, personal traits with a high need for achievement include being responsible for solving problems (internal LOC), setting goals to be achieved by own efforts (commitment) and constantly asking for feedback on accomplishments. McClelland's findings reject the "profit motive" as the drive of entrepreneurship which is claimed by some economists (Hamilton et al. 1994). However, in this thesis the "profit motive" is included since it is highly possible that individuals would be driven by one or both of these two motivations, maybe some other motivations too.

But why it is important to understand the personal traits of entrepreneurs and their drive for intention, especially the internal drive – achievement motivation? Hofer et al. (2013) claimed that instead of paying most of the attention to a business plan to assess the security and certainty of investment on new ventures, "focus should rather be on more tangible and action-oriented features of the start-up; i.e. the personality, drive, and engagement of the entrepreneur(s) (…)". This implies that nowadays it is a trend that investors start to value more the entrepreneurs themselves, such as what kinds of personal qualities they have and what drives their intention and actions for founding and growing a new business, to decide whether to offer investment or not. Because the same business plan, be it as perfect and secure as possible, executed by different individuals with different personalities and drives will not end up with the same outcome – who is doing it and why doing it, both of which essentially determine the difference of individual's entrepreneurial ability (Gilad 1982, 157; Gilad 1986, 201), will have the significant impact on the success probability. Moreover, according to Hamilton et al. (1994), "economists (...) [are] neglecting the unique set of personal qualities which characterize the entrepreneurial type and emphasizing the demand-side determinants of entrepreneurial activity. (...) [While] Psychologists and sociologists reject (...) that the supply of entrepreneurship can be induced systematically and frictionlessly by the conditions of the market. Hence, factors on the

supply side are predicted to be possible prime determinants of entrepreneurial activity – a lack of vigor in entrepreneurial response being attributed to supply factors (not enough potential entrepreneurs in the society) rather than demand-side factors (such as lack of opportunities or rewards for entrepreneurial endeavor)." With this being said, external pulling factors like opportunity and reward seem to be less responsible for the emergence of entrepreneurship behavior if there were no individuals with potential entrepreneurial personalities and the internal drive for entrepreneurial intention – these two internal pushing factors seem to be the fundamental cause of entrepreneurship. This means that if entrepreneurship is to be promoted and the supply of entrepreneurs is to be increased effectively, focusing on the internal factors - personal traits and the internal drive for intention - should be the starting point.

In all, an entrepreneur, as a person, is an individual with certain entrepreneurial personal traits and has certain drive of his/her entrepreneurial intention, which differentiates his/her entrepreneurial ability from others. It is important to identify people with entrepreneurial personal traits as well as understand and take advantage of the drive of their entrepreneurial intention in order to develop potential entrepreneurs from them effectively.

2.1.2 How Social-cultural context affects the supply of entrepreneurs?

Besides the intrinsic factors - personal traits and the drive for intention – that determine whether a person could be a potential entrepreneur on an individual level, social-cultural context, as the extrinsic factor, where people are interacting with and also within, can also affect emergence of entrepreneurs on a group level.

First, social and cultural context influences the development of achievement motivation and other psychological factors that produce entrepreneurial personalities. McClelland's (1961) researches show that certain aspects of social and cultural environment, for example, family socialization, could affect the development of the need for achievement – one of the motivations of entrepreneurial intention – and hence the supply of entrepreneurship. Also, Hagen (1962) argued that certain social changes can lead to certain psychological changes that eventually generate entrepreneurship. His theory suggests two important social determinants of the supply of entrepreneurship - loss of status recognition

and relative social blockage, both of which drive psychologically to produce entrepreneurial personalities. Loss of status recognition means "members of a previously accepted social group perceive that their value system is no longer recognized by other social groups whose respect they seek" (Hamilton et al. 1994) and relative social blockage means "subordinated groups (...) are alienated from society", suffer "barriers to entry to specific social networks" and "feel discriminated against" (Hamilton et al. 1994). Both scenarios could initiate long-term changes in child-rearing practices, as well as group personality and behavior to neutralize or re-establish their social status, and one of the crucial and best ways (and usually the only way) to achieve this is by being creative and entrepreneurial, and being successful in business. Here, Hagen suggested one possible model of social-cultural mechanism on how individuals could be driven into entrepreneurship, again in a "push" way. His findings are somehow interestingly overlapping with McClelland's. Moreover, Gilad (1982, 157; 1986, 201) suggested that a society based on decentralized regulation tends to produce more citizens who believe in internal LOC and who are entrepreneurial than a centralized society.

Second, entrepreneurial culture stimulates and guides entrepreneurial behavior, and facilitates entrepreneurial activities. According to Hamilton et al. (1994), the cultural approach to entrepreneurship "highlight[s] the importance of co-operation, supportive relationships and reciprocity in the economic sphere", they cited Casson (1990, 93) that "...a successful entrepreneurial culture must support both competitive and co-operative behavior…". In order to transform ideas into functional business activity, it is vital for the entrepreneurs to open up networks of co-operation with different stakeholders across their business value chain. Thus in a society with an entrepreneurial culture that encourages collaboration and strong moral commitment, networking is a norm and highly efficient, creating mutual trust and reciprocity while reducing the social transaction cost, and thus tends to contribute to the supply of entrepreneurship.

This implies that while no individual or organization alone can change the social-cultural context on a macro level into a favored condition for the supply of entrepreneurs, it is very helpful and useful to identify the potential entrepreneurs and understand better their motivation from the perspective of their social-cultural backgrounds, for purpose of better developing and supporting them into actual entrepreneurs. Also, it is possible to cultivate the appropriate culture on a micro level to stimulate more people, especially the potential

ones, to pursue entrepreneurship in a proper manner and in a smoother process with fewer obstacles.

2.1.3 What entrepreneurship is all about?

Entrepreneurship is not only about founding a new business venture, which is usually the form. Innovation is the core of entrepreneurship and it involves being able to sense the opportunities, generate and commercialize creative ideas or solutions to exploit the opportunities. Adjusting to new demands of rapid industrial development - which could be understood as opportunity - became the new expectation of entrepreneurship during Industrial Revolution in Britain (Hamilton et al. 1994). Shane and Venkataraman (2000) emphasized that entrepreneurship is about identifying and exploiting profitable opportunities. While opportunity is indicated to play a central role in entrepreneurship, it is more proper to be seen as part of innovation in this thesis from the author's point of view, because it is the innovation mindset that leads the entrepreneur to see the opportunity and transform it into a profitable or commercializable idea. For example, Duxbury (2012) pointed out that "Arguably, one of the first tasks demanded of an entrepreneur is to manifest creative ability through the conceiving of new product-market opportunities and unique value propositions. From these initial acts of creativity, entrepreneurs must build effective organizations that can repeatedly bring ideas to commercially valuable forms in order to survive and grow." Oldham and Cummings (1996) defined innovation as the successful commercial exploitation and implementation of creative ideas. And Mishra et al. (2014) claimed that "Entrepreneurship is not merely the process of founding a new venture. Entrepreneurship is defined as a process of value creation (…) [that] involves the entrepreneur identifying an external opportunity". Moreover, according to Schumpeter (1934), the function of an entrepreneur is to reform or revolutionize, such as creating new products or using new materials, or utilizing new technology and other invention in any business process, resulting in shaping the industry landscape. In other words, entrepreneurship is to innovate, being creative to identify, exploit and respond to opportunities with ideas or solutions and commercialize them.

Innovation is not only what entrepreneurship is about, but is also important for any entrepreneurial activity to succeed. Innovation might be in various forms depending on the

needs of different business stages, but its aim and function are the same - to ensure business advantage and competitiveness (Chell 2013), and it is considered "the most important engine for long-term competitiveness, growth and employment" (European Commission 2001). Thus, entrepreneurship without innovation will eventually fall out due to a lack of advantage and the ability to compete. Innovation is the fundamental content of venture formation and perpetuation, and it is what entrepreneurship is and must be.

In addition, it is worth of notice that it is important for entrepreneur to be creative, which is also one of the important entrepreneur's personal traits mentioned earlier, as it is the first step in innovation process, serving as the stimulus for finding opportunity (Duxbury 2012). There are different understandings of creativity, for example, Mumford, Hester, and Robledo (2012) claimed that creativity is the "production of high-quality, original, and elegant solutions to problems". This implies that creativity is a pragmatic activity oriented to problem-solving with a high level of cognition and decision-making. While Woodman, Sawyer, and Griffin (1993) put it: "Individual creativity is a function of antecedent conditions (e.g., past reinforcement history, biographical variables), cognitive style and ability (e.g., divergent thinking, ideational fluency), personality factors (e.g., self-esteem, locus of control), relevant knowledge, motivation, social influences (e.g., social facilitation, social rewards), and contextual influences (e.g., physical environment, task and time constraints)." It implies the mechanism of how creativity functions uniquely based on a set of factors. And Duxbury (2012) suggested that "The conditions of novelty, usefulness, and appropriateness remain valuable criteria in helping distinguish creativity from other organizational routines", which shows the specific features of creativity that differentiate the concept from others. And Sternberg (2006) stressed that there are six unique but interrelated elements for creativity formation: intellectual abilities, knowledge, styles of thinking, personality, motivation, and environment. It indicates what kinds of factors can be manipulated in order to develop creativity.

In particular, when exploring creativity as one of the important entrepreneur's personal traits, there are wider interpretations of what kinds of specific characteristics it could be linked to. Barron and Harrington (1981) reported that creativity is linked to a relatively stable set of core characteristics such as "high valuation of esthetic qualities in experience, broad interests, attraction to complexity, high energy, independence of judgment, autonomy, intuition, self-confidence, ability to resolve antinomies". And Shalley, Zhou and

Oldham (2004) considered that “openness to experience” has the strongest link to creativity and "Openness" factors include “traits of intellectual curiosity, originality, nonconforming, active imagination and aesthetic sensitivity, and preference for variety” and being “broad-minded, curious, and untraditional”. These specific characteristics and traits can be used to identify creative personalities as well as develop creativity in individuals via a more dynamic approach.

So essentially entrepreneurship is about innovation as it is vital for competition and it is the function and content of entrepreneurship, during which opportunities (such as problems or pain points, and new needs) are identified and exploited, and creative ideas are formed in response to the opportunities and being commercialized. Being creative is very important and is the beginning of innovation, finding people with creative personalities and developing creativity in a multi-faceted way hence has a crucial impact on innovation and eventually on entrepreneurship.

2.1.4 Entrepreneurship process and competence

But how does innovation actually happen? What kinds of activities or tasks support innovation as the core content in entrepreneurship? It is then necessary to understand the entrepreneurship process and the competences it requires.

Entrepreneurship process includes different tasks to be executed during different stages of a business venture, with different obstacles to tackle. Say (1964) assumed that entrepreneurs have to be responsible and capable of managing business activities like fundraising, production and product distribution. Mishra et al. (2014) claimed that “Entrepreneurship is defined as a process of value creation and appropriation led by entrepreneurs in an uncertain environment (...). The entrepreneurial process involves the entrepreneur identifying an external opportunity; matching the entrepreneurial resources at hand with the opportunity to effectuate an entrepreneurial competence; acquiring external resources, if necessary; creating sustained value; and appropriating the entrepreneurial reward." Chell (2013) formulated the entrepreneurship process into several steps – first, the desired end-state is identified based on the social and/or market need and the entrepreneur’s knowledge and understanding, then the available resource is configured and business activities are planned, finally, the business is created to achieve the desired outcome. For an even more detailed description, Mishra et al. (2014) divided the entrepreneurship process

into two stages. According to them, these two stages for venture formulation have their own focus. During the 1st stage, entrepreneurial intention or aspiration for entrepreneurial reward drives the entrepreneur to take a risk and establish the venture, entrepreneurial competence is developed to utilize the found opportunity and available resource for innovation to provide an asymmetric advantage for the venture to go into stage two. This stage is about doing what is possible based on what is available for survival - in an effectuation mechanism, it is similar to what Sarasvathy's (2001) theory of effectuation describes the nature of the initial entrepreneurial process. During the 2nd stage, the entrepreneur reconfigures the competence to search for external resources such as venture capital or strategic alliances to sustain the value creation and appropriate the reward. This stage is about obtaining what it needs based on what it wants to achieve for the purpose of growth, stabilization, or fruition - in a causation mechanism. In short, entrepreneurial intention, opportunity, vision for innovation and business growth, risk, resource, and appropriation of reward are the components of the entrepreneurial process, linked and affect each other via different business activities conducted by entrepreneurs with a set of entrepreneurial competences that develop and effectuate throughout the process with time.

While entrepreneurial intention drives the formation of a new business venture, initiating the entrepreneurship process, it is the entrepreneur's entrepreneurial competences that drive innovation and sustain the venture to achieve success via excellent performance or execution, leading to the other end of the entrepreneurship process. In this thesis, competence is understood as the capacity to perform a task competently with a set of combinations of one's knowledge, skill and ability (Markman 2007; Chell, 2013; Dreyfus & Dreyfus 1986) – for example, knowledge is gained based on needs and applied to real-world problems and direct the actions (especially the creation of solutions or ideas) that will be realized by skill and ability.

The importance of entrepreneurial competence for the success of entrepreneurship cannot be overstated. First and foremost, competence is crucial for the performance of all the entrepreneurial tasks on the expected level. Hofer et al. (2013) claimed that competence is one of the most important inputs for successful entrepreneurship and that "motivated people need the right skills to identify entrepreneurial opportunities and to turn their entrepreneurial projects into successful ventures." Similarly, Chell (2013) stated that "[entrepreneurial] skills are required to ensure effectiveness [of entrepreneurship] over time

that will result in desired outcomes (product/service innovation, business creation, etc.)". For example, competence is needed to identify the opportunities – entrepreneurs need to have cognitive ability, such as information processing and interpreting as well as envisioning, to recognize the opportunities (Timmons, Smollen & Dingee 1985; Timmons 1989; McClelland 1987; Kaish & Gilad 1991; Chell 2008; Baron 2000), or entrepreneurs need to have certain domain knowledge and experience which enable them to understand and sense the social and/or market need for innovation and thus develop the opportunities (Ardichvili, Cardozo & Ray 2003). For another example, being able to champion and promote promising ideas effectively – one of the many important entrepreneurial competences – is the key to obtain necessary resource for turning the ideas into innovation (Duxbury 2012). Second, competence and the action led under the competence to develop business strengthen the confidence in both the entrepreneurs when initiating the venture and the investors when seeking resources and funding (Hofer et al. 2013). Third, competence, such as planning and arranging entrepreneurial activities strategically, can enhance entrepreneurial intention (Mishra et al. 2014). In all, entrepreneurial competences increase the momentum of entrepreneurship in the beginning of the entrepreneurship process and drive the process toward the expected outcome.

Entrepreneurial competence includes a wide range of entrepreneurship knowledge, skills and experience. Below are four categories of relevant and important entrepreneurial competences based on a number of literatures (Markman 2007; Harte & Stewart 2012; Gilbert 2012; Chell 2013)

Knowledge competence:

- Business knowledge
- Domain knowledge
- Social/market knowledge

Mental competence:

- Self-directed/spontaneous learning
- Cognition and analysis
- Creative thinking
- Decision making

- Adeptness and flexibility
- Resilience

Business competence:

- Strategic thinking
- Opportunity recognition and evaluation
- Problem-solving
- New product/service prototyping and development
- Resource utilization/configuration
- Business planning and organizing
- Risk management

Human competence:

- Leadership
- Teamwork
- Networking
- Relationship handling, stakeholder management and communication

Furthermore, it is important to realize that entrepreneurial competence is constantly in dynamic change. Throughout the entrepreneurship process, the entrepreneurial competences can evolve in a cycle of "acquisition – effectuation – development" based on the real experience the entrepreneur is facing.

2.1.5 Journey of becoming an entrepreneur

It is necessary to understand that the journey for one to become an entrepreneur is complicated, unique, nonlinear, factors-related and time-dependent, yet influenceable. The complication of this process is due to, first of all, that each individual is unique, especially when referring to personality, background and the perception of entrepreneurship, and there is no "one-way-fits-all" approach for one to become an entrepreneur; second, that one's status could be switched in the cycle of being and not being (or both) an entrepreneur as many times as possible; third, that there are so many factors that can influence one's entrepreneurial intention and behavior with different weights throughout the time;

and fourth, that timing is very important in the sense that one might need the time to get prepare and/or realize own passion for entrepreneurship, or opportunity and resource to support the entrepreneurial activities might not be available until certain timing. Nevertheless and fortunately, the journey of becoming an entrepreneur can be supported or facilitated, by impacting the influenceable factors.

As mentioned earlier, motivation drives entrepreneurial intention and entrepreneurial intention is a valid predictor of entrepreneurial behavior, it is interesting to understand the other important factors that can affect entrepreneurial intention and/or entrepreneurial behavior so that by influencing those factors, individuals can be guided into entrepreneurship. König (2013) has developed a model with seven elements that can determine the development of entrepreneurial behavior - demographic factors, personal attributes, attitudes and beliefs, intentions, environment, education, and competence. And with a bit overlapping with the seven elements just mentioned, according to Ajzen (1991), Ajzen and Fishbein (1980), there are three conceptual determinants of behavioral intention that can be applied in the entrepreneurship context, they are: (a) personal attitude – how one emotionally considers and evaluates entrepreneurial behavior (Autio et al. 2001; Fitzsimmons & Douglas 2011), (b) subjective norms - the perceived social pressures relating to having or completing entrepreneurial behavior (Autio et al., 2001), and (c) perceived behavioral control - the perceived control on the entrepreneurial behavior and the expected outcome, which similar to the term of self-efficacy (Ajzen, 1991; Bandura, 1977) referring to one's belief or confidence of own ability to perform the behavior successfully in either easy or difficult situations. All these factors are interrelated to and affecting each other in a mechanism that eventually determines whether one will actually initiate entrepreneurial behavior (König 2013).

Out of all factors mentioned above, attitude, motivation and self-efficacy are believed to have the most direct impact on entrepreneurial intention and entrepreneurial behavior. First, regarding attitude, approximately 50% of the variance in intentions is due to different individual attitudes (Autio et al. 2001), which means attitude towards entrepreneurship might have the strongest impact on entrepreneurial intention. Lüthje et al. (2003, p. 142) argued that improving one's attitude towards entrepreneurship "apparently is an effective lever" to increase the amount of potential entrepreneurs. Attitude can be influenced by demographic and psychological factors, personal traits, individual competence,

social network, role models and environment (Fini, Grimaldi, Marzocchi & Sobrero 2012; Shane, Locke & Collins 2003; Lüthje et al. 2003; König 2013). Especially for students, it is confirmed that university environment can also influence their attitude towards entrepreneurship (Sitaridis et al. 2019). Second, regarding motivation, it is confirmed that there is a positive effect of motivation on entrepreneurial intention and motivation is believed to be the major driver of entrepreneurial intention with the need for achievement as the most significant motive towards entrepreneurship (Sitaridis et al. 2019). While McClelland's (1961) earlier study highlighted that certain child-rearing patterns and social-cultural environment are important to the development of achievement motivation, they were seen as with less impact in his later work (McClelland & Winter 1969), and he suggested that the development of achievement motivation could be conducted in adults via training programs (Miron & McClelland 1979). This implies that educational institutes such as universities can "move into teaching achievement motivation to aspiring [potential] entrepreneurs" (Hamilton et al. 1994) among students to enhance their entrepreneurial intention. Third, regarding self-efficacy, it is argued that entrepreneurial self-efficacy is a critical antecedent of entrepreneurial intention and behavior (Boyd & Vozikis 1994; Zhao, Seibert & Hills 2005.) and there has been empirical evidence to confirm that entrepreneurial self-efficacy enhances entrepreneurial intention (Kassean, Vanevenhoven, Liguori & Winkel 2015). Competence seems to be one of the most significant factors to affect entrepreneurial self-efficacy because it enables an individual to evaluate own performance versus the perceived risk in a more realistic way (König 2013), and hence educational interventions is likely to have an impact on entrepreneur formation in the long run (Kasturiratne et al. 2012) when development of competence is in its focus (König 2013).

What could the journey of becoming an entrepreneur look like? The factors mentioned above can affect and change the path at any given point. In form, under the impact of these factors, the journey usually starts when an individual develops own entrepreneurial perception and intention, and initiates the entrepreneurial actions as a nascent or potential entrepreneur, then it continues as the individual becomes a practicing entrepreneur and ends when the individual becomes an entrepreneur in practice (Edwards & Muir 2012). In content, "successful entrepreneurs follow a learning journey, which starts in education and continues with learning-by-doing processes; both formal and informal learning inside

and outside the firm" (Hofer et al. 2013). But nevertheless, the most important thing of the journey is the personal maturity into entrepreneur identity (Down 2006, 109) through "values judgements, business acumen, social responsibility and personal achievements and satisfaction" (Edwards & Muir 2012) from both success and failure, gaining experience from the interaction with different environments/situations.

2.2 University and Entrepreneurship

Since facilitating economic and social development was stated as the 3rd mission of universities, the role, goal and activities of universities evolve based on how the 3rd mission has been interpreted in a specific context. And promoting entrepreneurship is one of the best and most suitable ways to interpret and fulfil the 3rd mission as mentioned earlier, with the aim to educate, support and strengthen student entrepreneurship and assist both knowledge and technology transfer (Kuratko 2005; Shane 2004). But how do the universities transform themselves into a proper status for fulfilling the 3rd mission? For the first thing, role changes. Since universities play a crucial role in regional innovation and economic growth (Etzkowitz 2003), it is almost mandatory for universities to educate potential student entrepreneurs in order to stay competitive (König 2013). The emergence of knowledge economy nowadays means that universities need to change their position in education. As Miller, Alexander, Cunningham and Albats (2018) put it this way: "In essence, universities are now required to become more entrepreneurial in their organizational outlook and their offerings". For the second thing, goal changes. Since students are the future entrepreneurs (Lüthje et al. 2003), the main elements of universities' goals should include supporting students' entrepreneurial intention, attitude and personality (Etzkowitz 2003) and encouraging entrepreneurial spirit (Sperrer, Müller & Soos 2016) in order to create regional impact in the long run. For the third thing, activities change. Educational and research activities are not anymore enough, activities of establishing entrepreneurial culture (Pei-Lee & Chen-Chen 2008), providing inspiration for entrepreneurship (Turker & Selçuk 2009), offering experience of entrepreneurial process (Heinonen et al. 2006), encouraging initiatives and providing active entrepreneurial support (Souitaris, Zerbinati & Al-Laham 2007.) are important and much needed in the university environment. The policy and priority of universities should focus on creating support structures that could arrange these activities to foster entrepreneurship (Pei-Lee et al. 2008).

2.2.1 Entrepreneurial university

Following the concept of promoting entrepreneurship to fulfill the 3rd mission, entrepreneurial university emerges. There are many definitions of entrepreneurial university, for example:

- An innovative and natural incubator that supports faculty's and students' entrepreneurial intention and enable them to transform intentions into actual entrepreneurial behaviors, especially in the knowledge-based sectors. (Etzkowitz 2003; Kirby 2006)
- "A promoter of multiple support measures for entrepreneurship" (Guerrero & Urbano 2012)
- A university that acts entrepreneurially to adapt, compete and survive in a highly complex and ever changing environment with innovation. (Clark 1998 & 2001).
- A university that assumes its role within the triple helix model and commits to the third mission (Philpott, Dooley, O'Reilly & Lupton 2011)
- A university that adopts an entrepreneurial management approach in its leadership, governance, and organizing, interacts entrepreneurially with its environment such as responding to the real needs of the market with an innovative solution and establishing close university-industry collaborations, and empowers faculty to act entrepreneurially and take bigger responsibility for getting external funding (Ropke 1998; Subotzky 1999; Blenker, Dreisler, Færgemann & Kjeldsen 2004).
- A university that is able to commercialize and commoditize its innovative knowledge such as programs, courses, patents and licensing, and involve the creation of faculty's or students' new business ventures (Doutriaux 1987) with established own facilities which include structures like innovation centers and/or technology transfer offices, incentives as well as allocation of research funding based on both private and public sectors' need (Jacob, Lundqvist & Hellsmark 2003).
- A university that embraces educating the future entrepreneurs and acting like an entrepreneur as its two main tasks. (Schulte 2004)

These definitions imply that the activities to distinguish an entrepreneurial university include but are not limited to:

- Educate and promote entrepreneurship, create a positive impact on entrepreneurial intention and entrepreneurial behavior, and encourage the transformation of entrepreneurial intention into entrepreneurial behavior
- Provide a protective environment and support for students' and faculty's entrepreneurial activities with different facilities and measures
- Establish and take advantage of effective network and collaborations with industry and government in its operations
- Create and sustain an entrepreneurial culture in its internal environment via leadership, organizational changes and empowerment.
- Act and respond entrepreneurially to the social/market need with innovation and its own knowledge assets

In fact, the latter three activities are supporting the first two activities which are of the most direct relevance to the promotion of entrepreneurship, and there is evidence showing how an entrepreneurial university can actually affect entrepreneurial intention and behavior. For example, the three dimensions of university environment that mostly affect students' entrepreneurial intention are initiation, development, and active support, and through influence on their intention leads to influence on their entrepreneurial behavior (Franke & Lüthje 2004). Here, the initiative could be an inspirational atmosphere that encourages entrepreneurial ideas such as arranging business plan competitions and/or a positive entrepreneurial climate that helps opportunity identification such as offering project-based experience on technology solution commercialization (Boh, De-Haan & Strom 2016; Zollo et al. 2017). The university development could refer to educational programs that deepen and extend students' perception of entrepreneurship (Kuratko, 2005; Peterman & Kennedy 2003), generate strong motivations (Miron et al. 1979; Carayannis 2014) and positive attitude (Guerrero et al. 2012; König 2013) towards entrepreneurship, and build entrepreneurial competences (Zollo et al. 2017). And the active support could be creating platforms for teambuilding, supporting to build organizational routines such as idea and risk evaluations, marketing and negotiation, clear referral that facilitate networking and collaborations with other financial and business sectors, providing facility such as office or laboratory space, IT and administrative service and access to knowledge re-

source, offering legal and business consultancy, as well as mentoring programs that support the process of establishing a new business venture by students in a tailored way (Pei-Lee et al. 2008; Hofer et al. 2013).

In order to enable these activities in university environment, a model or framework of entrepreneurial university that is suitable for its specific geographical context is essential and has been widely stressed in literature (Caiazza & Ferrara 2016; Clark, 2001; Etzkowitz et al. 2000). Besides, the model of an entrepreneurial university is also recognized as a major driver for both university's self-development and innovation which enable it to respond appropriately to the highly turbulent and unpredictable markets in order to succeed (Hannon 2013). And because of high heterogeneity in different universities' specific situations such as local context, goals, orientation and resources, "there is no typical way to be or become an entrepreneurial university" (Martinelli, Meyer & Von Tunzelmann 2008). Strategy on model development and formation has to adapt to different types of entrepreneurial universities (Guerrero et al. 2012). Following the HEInnovate (2022) framework, which was created by European Commission in partnership with the OECD as a self-reflection tool for Higher Education Institutions to explore and develop their entrepreneurial and innovative potential, universities could work on a model that is suitable for them. According to this framework, there are eight key areas in a university that could be reflected on, diagnosed, prioritized and planned:

- Leadership and Governance
- Organizational Capacity: Funding, People and Incentives
- Entrepreneurial Teaching and Learning
- Preparing and Supporting Entrepreneurs
- Digital Transformation and Capability
- Knowledge exchange and collaboration
- The entrepreneurial university as an internationalized institution
- Measuring the impact of the entrepreneurial university

However, not all the areas are relevant to each university, and applying HEInnovate framework is just one of the many ways to develop the model of entrepreneurial university. Here are some common models of entrepreneurial university developed by researchers from either similar or different points of view from the HEInnovate framework:

Model focusing on academic entrepreneurial outputs with external and internal support (Markuerkiaga, Caiazza, Igartua & Errasti 2016)

In this model, there are two external entrepreneurship support factors including institutional context and industrial context, and eight internal entrepreneurship support factors including mission and strategy, management support, policies, support through the whole entrepreneurship process, funds for entrepreneurship, entrepreneurship education, staff development in entrepreneurship, and active teaching methodologies. Together these factors affect the entrepreneurial university's result in eight aspects – networking, mobility with industry, consulting, industry training courses, collaborative research, patents and licenses, students' spin-offs, and academics' spin-offs.

Model focusing on building university's own environment and capacity (Guerrero et al. 2012)

Based on the proposal of formal and informal factors that influence the formation and development of an entrepreneurial university (Guerrero-Cano, Urbano & Kirby 2006), this model includes both the formal and informal factors as the environmental factors, and in addition, suggests internal resources and capabilities as the internal factors:

- Formal factors: entrepreneurial organizational and governance structure, support measures for entrepreneurship, entrepreneurship education.
- Informal factors: university community's attitudes towards entrepreneurship, entrepreneurial teaching methodologies, role models and reward system.
- Resources: human capital, financial, physical, and commercial.
- Capabilities: status and prestige, networks and alliances, localization.

Together these factors affect the entrepreneurial university's outcomes in 3 aspects - teaching, research, and entrepreneurial activities. Of all the factors, the university community's attitudes towards entrepreneurship are the most critical and should be reflected in other factors, especially in entrepreneurship education, teaching methodologies, and role model and reward system.

Model based on systems theory – IPOO (Input-Process-Output-Outcomes) (Salamzadeh, Salamzadeh & Daraei 2011)

This model defines an entrepreneurial university as a dynamic system, "which includes special inputs (Resources, Culture, Rules and regulations, Structure, Mission, Entrepreneurial capabilities, and Expectations of the society, industry, government and market.), processes (Teaching, Research, Managerial processes, Logistical processes, Commercialization, Selection, Funding and financial processes, Networking, Multilateral interaction, and Innovation, research and development activities), outputs (Entrepreneur human resources, Effective researches in line with the market needs, Innovations and inventions, Entrepreneurial networks, and Entrepreneurial centers) and aims to mobilize all of its resources, abilities and capabilities in order to fulfill its 'Third Mission'" as its outcome.

Model focusing on creating an entrepreneurial ecosystem (Miller et al. 2017)

This model categorizes the elements and features of an entrepreneurial university according to the three characteristics of Turner's frontier – available assets, liberty, and diversity – and defines university as an entrepreneurial ecosystem where "the agents (entrepreneurs) and their interactions with institutions and other agents are keys to the successful functioning of the model" (Miller et al. 2017). In this ecosystem, the student entrepreneurs (agents) are the core, surrounded by available assets, liberty and diversity that enable them to initiate the firm-formation process. The available assets refer to courses, extracurricular and co-curricular options, faculty, alumni, mentors, networks, research, facilities, technology, test market and seed fund. The liberty refers to dispersed decision-making for administration and faculty, freedom of research and field of study, extracurricular choices, part-time/full-time/executive options, and transfer system. And the diversity refers to the university community's different ethnicity, place of birth, field of study, age, education levels and political ideologies; regenerating youthful populations, visiting scholars and students, full-time/part-time students and faculty, and adjuncts/research/teaching faculty.

To illustrate better how the factors or elements of entrepreneurial university models interact and work to achieve an environment that promotes entrepreneurship, here are some examples of real entrepreneurial universities' practices (Hofer et al. 2013; Sperrer et al. 2016; Miller et al. 2017; Pei-Lee et al. 2008) from several case studies:

On strategy

- Create and communicate a clear goal, mission statement and strategy on entrepreneurship promotion, develop key indicators to measure entrepreneurship outcomes and effectiveness, implement actions with strong leadership drive and effective resource allocation

On communication and co-ordination

- Use effective communication strategy to increase the engagement of both faculty and students in entrepreneurship as both a profession and a process that is open for participation
- Formalize institutional structure to co-ordinate initiatives, interdisciplinary activities and events, and mobilize resources to support local networking, knowledge-sharing, financing possibilities and growth opportunities with clear working processes

On facilitation and collaboration

- Create platforms for teambuilding and networks, take advantage of the diversity in both students and faculties
- Engage alumni as mentors and secure access to established companies and real-life experience
- Cooperate with local businesses regarding guest lecturing, project work, access to real-life cases, interaction with student start-ups, and development of new solutions for existing challenges
- Facilitate close contact with financing agents such as banks, business angels and VCs
- Promote open innovation on campus with leverage of external resources and close and diverse collaboration with government, industry and other knowledge institutions

On resource and support

- Provide access to research results and knowledge/technology resources, and integrate interdisciplinary research and research in practical fields into entrepreneurial activities

- Utilize the university's own specific advantages, assets and practices to provide tailored support and a protective environment for students' and faculty's venture creation and growth

On teaching and learning

- Develop and expand a wide variety of entrepreneurial courses focused on students' demands, and offer access to entrepreneurial courses/lectures/workshops/seminars to cover all students from different faculties.
- Consider the starting level of students, their needs and expectations, as well as their profiles (such as LOC, personality and cultural background) when planning courses and executing the teaching activities, to achieve a better learning outcome.
- Focus entrepreneurial education on shaping personal values, drive, attitude towards entrepreneurship and entrepreneurial spirit, raising interest and enthusiasm in entrepreneurship and the desire for entrepreneurial actions.
- Stimulate the development of entrepreneurial behavior, especially by developing entrepreneurial competence, with constant encouragement and engagement via experiential learning activities, such as adopting a team-based approach with a focus on real-world problem-solving, while reducing the reliance on traditional teaching methods and tools such as business plan.
- Offer personalized coaching and counseling based on needs, advocate and create an environment for students' personal development into entrepreneur identity.

2.2.2 Evaluating entrepreneurial university

It has been summarized (Markuerkiaga et al. 2016) that there are two main approaches to evaluate an entrepreneurial university – by factors and by indicators. The first one evaluates the entrepreneurial university based on the development level of the factors that form the entrepreneurial university, while the other one is based on a set of indicators of the entrepreneurial university's results. No matter which approach is to be used for evaluation, it makes sense to consider what impact an entrepreneurial university wants to create and what kinds of achievements are expected. Evaluation should be based on an entrepreneurial university's own objectives, which could be relatively diverse. But since the number of new ventures (Hytti, Stenholm, Heinonen & Seikkula-Leino 2010) or jobs

created (Edwards et al. 2012) are usually not the immediate goals, evaluation should include some intangible outcomes such as the spread of entrepreneurial culture and the creation of entrepreneurial mindset in students (Hofer et al. 2013) in addition to the traditional pass rates and grades, and it needs to switch from knowledge-based criteria to competency criteria (König 2013), and focus more on students' personal development during the journey of transforming into an entrepreneur (Edwards et al. 2012). Moreover, it is important that the criteria or the measurement of success in the evaluation system will take into account the local and contextual perspectives (Harte et al. 2012). Hence, tailored, systematic and long-term approaches should be applied in the evaluation of entrepreneurial university (Hofer et al. 2013).

3 MODEL DEVELOPMENT

Based on the relevant theories and literature reviews in the previous chapter, a generalized model is developed as below to illustrate how a university could foster entrepreneurship by creating a suitable environment that focuses on impacting the factors that lead to students' entrepreneurial behavior, taking into consideration of students' profiles.

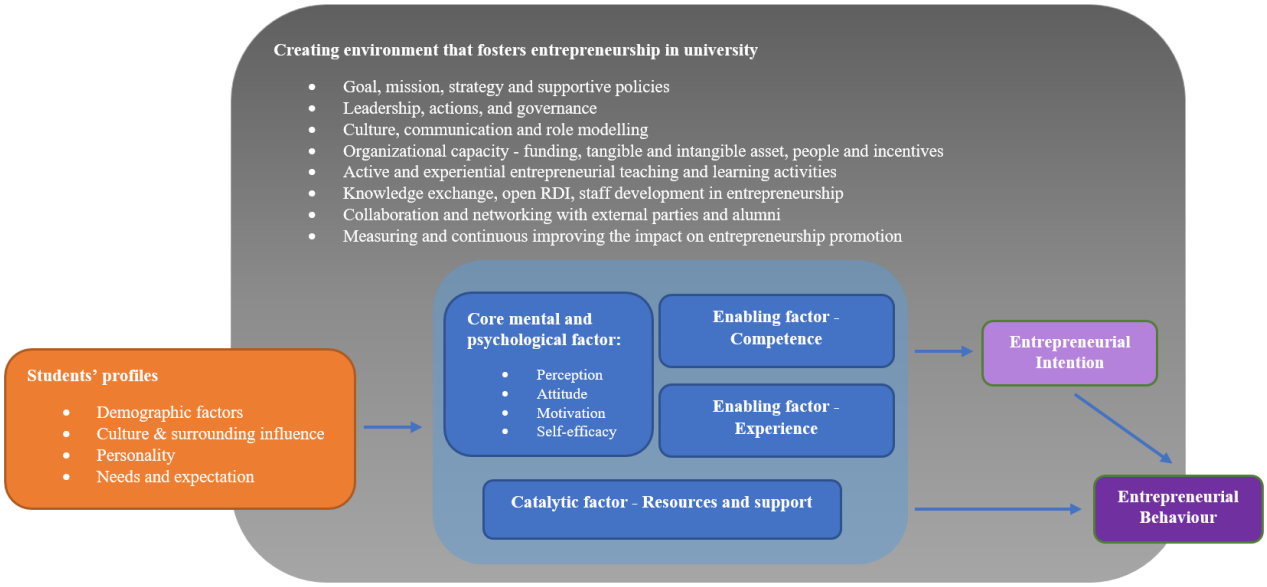

Figure 1. Operational Model for Fostering Entrepreneurship on Campus

In this model, there are four factors that foster students' entrepreneurial intention and behavior – one core factor, two enabling factors and one catalytic factor. The core factor is mentally and psychologically related to entrepreneurship and have a fundamental influence on one's decision to become an entrepreneur or not, and it includes four elements - students' perception, attitude, motivation and self-efficacy. The two enabling factors including students' entrepreneurial competence and experience, will ensure that one knows how to perform actual entrepreneurial behavior exactly, meanwhile increasing the probability of success and enhancing one's entrepreneurial intention. The catalytic factor referring to resources and support provided by the university will not only advance the happening of students' entrepreneurial behavior during their time in the university or soon after graduation, but also accelerate and protect their initial entrepreneurial process, lowering the probability of failure in the new venture's early stage. All these factors should be influenced positively and enhanced inside an entrepreneurship-fostering environment

on campus, which can be achieved by configuring and realizing eight areas in a university:

- Establish a clear and proper goal, mission, strategy and supportive policies
- Adopt effective leadership, actions, and governance
- Create an entrepreneurial culture, communicate and role model to advocate and encourage entrepreneurship
- Build and utilize organizational capacity - funding, tangible and intangible asset, people and incentives
- Design and apply active and experiential entrepreneurial teaching and learning activities
- Promote knowledge exchange and open RDI with other institutes, support staff development in entrepreneurship
- Collaborate and network with external parties and alumni on projects, events, programs and lectures
- Measure and continuously improve the impact on entrepreneurship promotion

Students' profiles belong to part of this model, which include four elements - demographic characteristics, culture and surrounding influence, personalities, as well as needs and expectation towards entrepreneurship. The students' profiles should be taken into consideration to achieve customized impact on those factors, as different profiles will require different stimulation on the mix of factors and hence determine how the university should interact with these factors to optimize the effect on fostering entrepreneurship. Finally, the outcome of this model is students' actual entrepreneurial behavior, which could appear either inside or outside the university's environment during their study time, or after their graduations.

The four factors and the eight areas of campus environment in this model can be used as parameters in evaluating how successfully or effectively a university has fostered entrepreneurship, in addition to the more direct indicators such as entrepreneurial intention and entrepreneurial behavior, which might be relatively vague to measure, and might not be necessarily realized immediately most of the time. A university does not need to work on or realize all the eight areas, which are just generalized as a framework in this model as an example, but rather it could choose only the relevant areas to focus on or design a

totally different set of areas to work with, based on own objectives and capacity. The most important thing here is that the university should create an entrepreneurship-fostering environment that is able to effectively influence those four factors in a customized way for students with different profiles.

This thesis will focus on analyzing the students' profiles, the factors, and the evaluation on some of the areas in the university's environment in order to customize this model so that it works specifically with VAMK's situation on improving its practices in fostering entrepreneurship.

4 METHODOLOGY

This section presents what quantitative research approach is and how the questionnaire of the survey was designed for data collection; it also describes the processes of target group selection and data collection; last but not least, it explains the steps and techniques for data analysis.

4.1 Quantitative Approach

A quantitative research approach focuses on objective measurements and the statistical, mathematical, or numerical analysis of data to generalize it across groups of people or to explain a particular phenomenon, or to test a certain hypothesis. Data is usually in the form of numbers and is collected via polls and surveys, or by manipulating available statistical data using computational techniques. The interesting performance found from the data could lead to further investigation by qualitative research to find out the possible reasons and mechanisms behind the phenomenon. Theories are usually applied in designing the variables and hence ground the fundamental of the quantitative research. (Kuada 2012; Babbie 2010; Muijs 2010.)

4.2 Questionnaire Design

There are several steps involved in developing the survey questionnaire. First, relevant theories and literature were reviewed in order to develop a general model (Figure 1) on how a university could foster entrepreneurship. Inside this model, there is a set of fostering factors leading to the emergence of students' entrepreneurial intention and behavior, a set of relevant elements of students' profiles that might determine the demands of the factors, and a set of areas forming the university's environment that can impact the fostering factors and eventually foster entrepreneurship. The relationship of all the items in the model was mapped and illustrated.

Second, the variables measuring the majority of the items in the model were carefully developed based on the reviewed theories and literature. Three items in the model, including goal/mission/strategy/supportive policies, leadership/actions/governance, and measuring and continuously improving the impact on entrepreneurship promotion, were not in this research's range because it is not relevant for the students to evaluate these

three items from their perspectives. Items including personality, competence, experience, and resource and support were measured with more than one variable to achieve better accuracy and objectivity of the data. Measures for profile-related variables were assessed on nominal categories to map the sample characteristics, which are summarized in Appendix 1 to 4. Measures for the factors-related variables were assessed on a 5-point Likert scale (1 = not important at all, 2 = not so important, 3 = slightly important, 4 = relatively important, 5 = very important) and the descriptive statistics are presented in Appendix 5. Measures for the variables on the evaluation of university's environment were also assessed on a 5-point Likert scale but with different contents (1 = strongly disagree, 2 = somehow disagree, 3 = neutral or I don't know, 4 = somehow agree, 5 = strongly agree) and the descriptive statistics are presented in Appendix 6. (FAO 1997a; Spector 1992.)

Third, each variable was developed into one statement or one question. The statements, the questions and the categorical options for the questions were derived from the reviewed theories and literature. Three open questions were added in the end to address other possible improvements or observations regarding fostering entrepreneurship in VAMK.

Finally, all the statements and questions were ordered logically to form the questionnaire which was then transformed into an e-survey using Microsoft Form. All the wordings and spellings were carefully checked and a pilot test on the survey was run to validate the functionality, the data format, and the time needed to answer; review and improvement were made before publishing the survey. (Pew Research Center 2022.)

4.3 Target Group Selection and Data Collection

All the students in VAMK were the target population.

To collect data, the questionnaire-based survey could be sent out via telephone, mail, email, internet or face-to-face communication. Internet survey is preferable when the research requires a large range of data, quick response, convenience and little cost, due to this feature and the requirement of this research, internet survey was adopted in this thesis.

The survey link together with a cover letter explaining the aim and importance of this research was sent to all students in VAMK via email. Respondents completed the survey anonymously and voluntarily, and they automatically formed the sample for this research

in a simple random sampling way. Three weeks was set as the responding time. Data from a total number of 45 respondents was collected and there were no missing values. All questionnaires were valid and adopted for further analysis. The effective response rate was about 1,4%. The sample size was relatively small and not fully aligned with the population structure. The sample represented the population with 15% margin of error at 95% confidence level. Due to the time schedule and the students' lack of interest in filling surveys, the research was needed to proceed to analysis with the available data. (FAO 1997b.)

4.4 Data Analysis

SPSS was used for data analysis to attain findings with significance level α set as 0.05. Below are the steps:

1. All the data were recoded into numerical if originally they were not.
2. Construct a new interval variable "Personality" based on the sum of the eight variables (Spector 1992) in Appendix 3, with the value "Yes" as 1 and "No" as 0. "Personality" measured how strong each student's entrepreneurial personality is (Figure 2). To transform "Personality" into an ordinal grouping variable that will be used in further analysis, a new variable "Personality_binned" was created from "Personality" using two cut points based on equal percentile, excluding the upper-end points. This resulted in 3 subgroups in "Personality_binned" (Table 1) – weak (Personality score less than 5), medium (Personality score from 5 to less than 7), and strong (Personality score larger than or equal to 7).
3. A Chi-square independence test in the Crosstable was performed to check any correlations among variables under the students' profile (UCLA 2022). Since these were all nominal variables, the chosen test was appropriate. Binned personality, learning intention and entrepreneurial intention were the most interesting variables in the students' profile and hence different pairs of variables for the test were formed between one of these three variables and other variables. The significant association would create a better understanding of the students' profiles.
4. Exploratory factor analysis (Kim & Mueller 1978) was performed to the variables measuring entrepreneurial fostering factors in Appendix 5 in order to calibrate the content of each factor, as well as to test the validity of the factor structure in the

model, which might lead to variables reduction and/or factor structure adjustment. The number of factors to be exacted was set to 4 to align with the model. Since some correlation among factors could be possible and hence expected, orthogonal rotation producing uncorrelated factors could potentially present a less useful result when factors are actually correlated. Therefore, oblique rotation (Direct oblimin) allowing the factors to correlate is more appropriate and thus used in this research. Furthermore, even if the factors are truly uncorrelated, there is hardly any drawback in using oblique rotation, and the result would be the same as that of an orthogonal rotation. Because it does not force factors to be correlated, but instead it can accurately model both uncorrelated and correlated factors (Osborne 2015).

5. Based on the extracted factors from the factor analysis, items loaded to the same factors were averaged into new composite variables with a summative scale for further analysis. This method to create new variables for the factors can retain the scale metric for easier interpretation, and is useful for comparisons across factors if there are different numbers of items per factor (DiStefano, Zhu & Mindrila 2009).
6. For each extracted factor, reliability test (Marshall & Boggis 2016) was performed to test the internal consistency and evaluate whether the items were measuring the same underlying factor. Repeated-measures ANOVA (UCLA 2022) was performed on each factor's items to test whether there were differences among the items.
7. To test whether there were differences among the extracted factors, and also whether any of the variables from the students' profiles have an effect on the difference, repeated-measures ANOVA was performed on the factors, as well as in combination with different profile variables. (UCLA 2022.)
8. Based on the result of the previous tests, if there would be any variables from students' profiles having a significant effect on the difference among the extracted factors, these variables would be used as the grouping variables in One-way ANOVA to further test the difference in different subgroups for each relevant factor. (UCLA 2022.)
9. Perform repeated-measures ANOVA to compare the needs and the evaluation of entrepreneurship fostering factors to identify possible gaps (UCLA 2022), alt-

hough the variables under the need and the evaluation were not on the same measurement (importance vs degree of agreement), it was seen as acceptable in this research to indicate where possible improvement in fostering entrepreneurship should be.

10. Categorize the answers from the open questions, to summarize improvement suggestions on fostering entrepreneurship in VAMK.

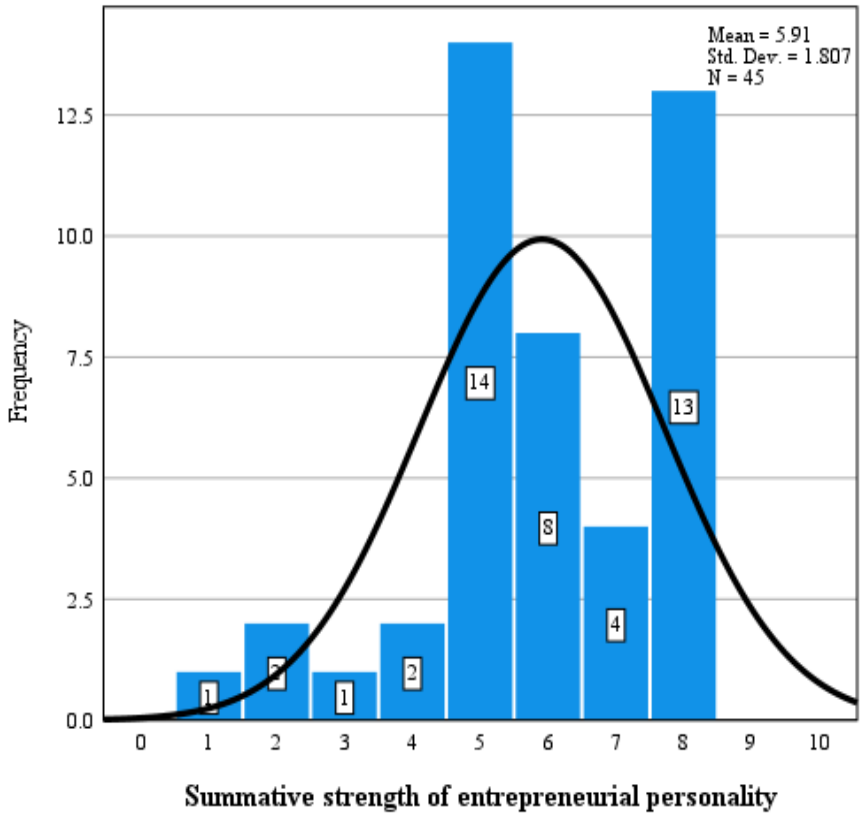

Figure 2. Histogram of personality.

Table 1. Frequency summary of personality_binned.

Personality_binned

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Weak	6	13.3	13.3	13.3
	Medium	22	48.9	48.9	62.2
	Strong	17	37.8	37.8	100.0
	Total	45	100.0	100.0	

5 RESULT AND DISCUSSION

This section presents and interprets all the results from data analysis. Discussions on the results were organized according to the four research questions of this thesis.

5.1 Profiles of Students in VAMK and Their Orientation towards Entrepreneurship

The profiles of the sample are presented in Appendix 1 to 4. Some interesting findings worth of notice are that based on Appendix 1, 82% of the sample has no experience at all in entrepreneurship and 22.2% of the sample does not have access to entrepreneurship courses in VAMK. Also based on Appendix 4, only 8.9% of the sample would like to learn for entrepreneurship while 40% of the sample would like to learn about entrepreneurship; meanwhile, 57.8% of the sample are not sure whether entrepreneurship could be their career option, 13.3% of the sample would need longer than 3 years after graduation to start a business, and 11.1% of the sample would like to go into entrepreneurship within 3 years after graduation.

Figure 3 and 4 visualize the profile of the 8 aspects of entrepreneurial personality from the sample. It seems that aspects with less strength are risk-taking propensity, creativity and alertness, and they tend to appear in students who have medium entrepreneurial personality, while students with strong entrepreneurial personality are strong in almost all 8 aspects. Supporting students in developing creativity, the sense of opportunity and confidence in taking risks, as well as providing a suitable environment might foster more strong entrepreneurial personality to appear among students.

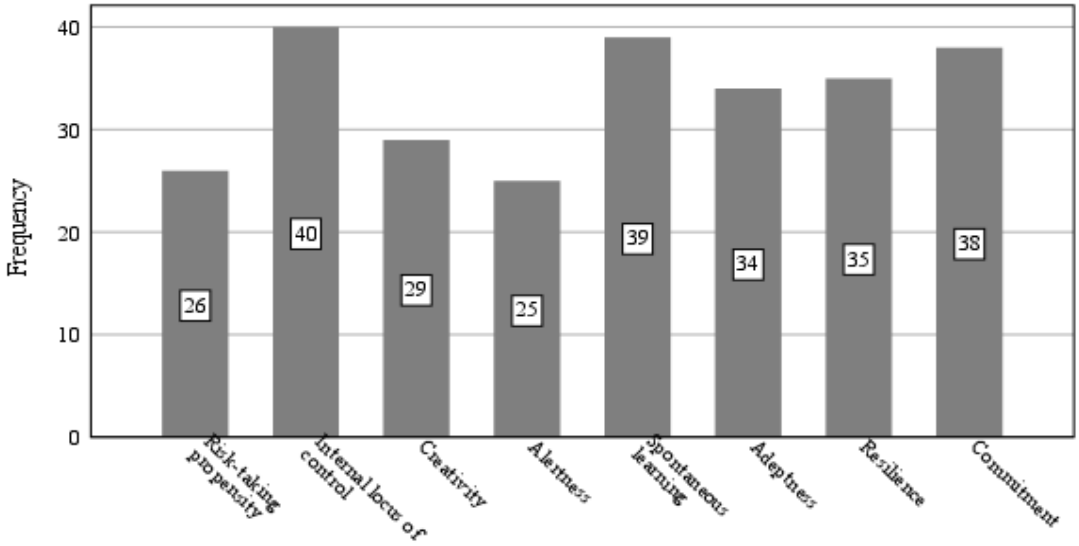

Figure 3. Profile of the 8 aspects of entrepreneurial personality from the sample.

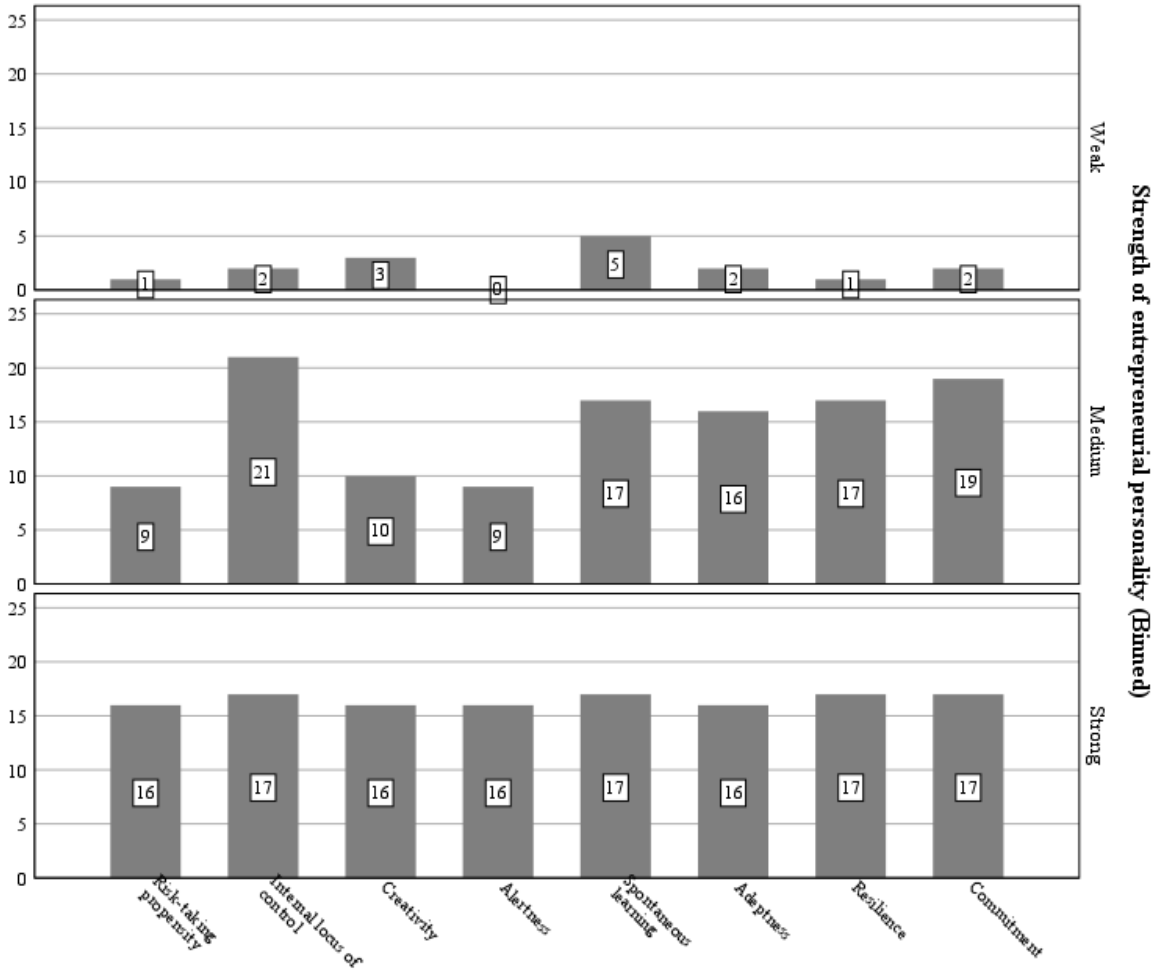

Figure 4. Profile of the 8 aspects of entrepreneurial personality from the sample grouped by the strength of binned personality.

Table 2 presents the result of Chi-square independence test in the Crosstable between entrepreneurial intention, learning intention, binned personality and other variables under the students' profile. It is observed that students' entrepreneurial intention has more statistically significant associations with the other profile characteristics than learning intention and binned personality. Result shows that students' entrepreneurial intention associates with their entrepreneurial experience ($\chi^2(8) = 23.745$, $p = 0.003$), the influence of role model in an active way ($\chi^2(12) = 24.918$, $p = 0.015$), their self-efficacy ($\chi^2(16) = 46.124$, $p = 0.000$), their learning intention ($\chi^2(12) = 28.302$, $p = 0.005$), and the strength of their entrepreneurial personality ($\chi^2(8) = 21.466$, $p = 0.006$). While students' learning intention also has association with their entrepreneurial experience ($\chi^2(6) = 14.542$, $p = 0.024$), the strength of students' entrepreneurial personality, on other hand, has association with entrepreneurial culture in their growth environment ($\chi^2(6) = 13.418$, $p = 0.037$). The association between the strength of students' entrepreneurial personality and the influence of role model in an active way is observed to be marginal ($\chi^2(6) = 12.149$, $p = 0.059$). However, the note in Table 2 indicates that the precondition for valid test result has not been met unfortunately, due to the small sample size. Hence, the confirmation of both the significant and the marginal associations mentioned above remains questionable, and for now, these findings can only be used as a guiding direction for future research. Figures 5 to 12 visualize the above-mentioned 8 pairs of associations in detail.

Table 2. Chi-square independence test in the Crosstable between entrepreneurial intention, learning intention, binned personality and other variables under the students' profile.

Chi-Square Tests

Crosstabulation pair	Pearson Chi-Square	df	Asymptotic Significance (2-sided)	Cramer's V	Note
Entrepreneurial_intention * Culture	9,185	12	0,687	0,261	17 cells (85,0%) have expected count less than 5. The minimum expected count is ,07.
Entrepreneurial_intention * E_experience	23,745	8	0,003	0,514	13 cells (86,7%) have expected count less than 5. The minimum expected count is ,09.
Entrepreneurial_intention * Gender	2,632	4	0,621	0,242	8 cells (80,0%) have expected count less than 5. The minimum expected count is ,47.
Entrepreneurial_intention * Region	1,181	4	0,881	0,162	7 cells (70,0%) have expected count less than 5. The minimum expected count is ,22.
Entrepreneurial_intention * Role_model_Active	24,918	12	0,015	0,430	18 cells (90,0%) have expected count less than 5. The minimum expected count is ,16.
Entrepreneurial_intention * Role_model_Passive	13,472	12	0,336	0,316	17 cells (85,0%) have expected count less than 5. The minimum expected count is ,11.
Entrepreneurial_intention * Self_efficacy	46,124	16	0,000	0,506	22 cells (88,0%) have expected count less than 5. The minimum expected count is ,04.
Entrepreneurial_intention * Study_Unit	7,868	8	0,446	0,296	13 cells (86,7%) have expected count less than 5. The minimum expected count is ,11.
Entrepreneurial_intention * Year	20,921	20	0,402	0,341	28 cells (93,3%) have expected count less than 5. The minimum expected count is ,04.
Learning_intention * Culture	5,336	9	0,804	0,199	13 cells (81,3%) have expected count less than 5. The minimum expected count is ,27.
Learning_intention * E_experience	14,542	6	0,024	0,402	9 cells (75,0%) have expected count less than 5. The minimum expected count is ,36.
Learning_intention * Entrepreneurial_intention	28,302	12	0,005	0,458	17 cells (85,0%) have expected count less than 5. The minimum expected count is ,09.
Learning_intention * Gender	5,430	3	0,143	0,347	2 cells (25,0%) have expected count less than 5. The minimum expected count is 1,87.
Learning_intention * Region	1,300	3	0,729	0,170	5 cells (62,5%) have expected count less than 5. The minimum expected count is ,89.
Learning_intention * Role_model_Active	15,907	9	0,069	0,343	14 cells (87,5%) have expected count less than 5. The minimum expected count is ,62.
Learning_intention * Role_model_Passive	11,211	9	0,262	0,288	14 cells (87,5%) have expected count less than 5. The minimum expected count is ,44.
Learning_intention * Study_Unit	4,619	6	0,593	0,227	8 cells (66,7%) have expected count less than 5. The minimum expected count is ,44.
Learning_intention * Year	18,750	15	0,225	0,373	23 cells (95,8%) have expected count less than 5. The minimum expected count is ,18.
Personality_binned * Culture	13,418	6	0,037	0,386	10 cells (83,3%) have expected count less than 5. The minimum expected count is ,40.
Personality_binned * E_experience	3,716	4	0,446	0,203	7 cells (77,8%) have expected count less than 5. The minimum expected count is ,53.
Personality_binned * Entrepreneurial_intention	21,466	8	0,006	0,488	13 cells (86,7%) have expected count less than 5. The minimum expected count is ,13.
Personality_binned * Gender	1,975	2	0,373	0,209	2 cells (33,3%) have expected count less than 5. The minimum expected count is 2,80.
Personality_binned * Learning_intention	7,931	6	0,243	0,297	8 cells (66,7%) have expected count less than 5. The minimum expected count is ,53.
Personality_binned * Previous_attitude	10,717	6	0,098	0,345	10 cells (83,3%) have expected count less than 5. The minimum expected count is ,40.
Personality_binned * Region	2,726	2	0,256	0,246	4 cells (66,7%) have expected count less than 5. The minimum expected count is 1,33.
Personality_binned * Role_model_Active	12,149	6	0,059	0,367	8 cells (66,7%) have expected count less than 5. The minimum expected count is ,93.
Personality_binned * Role_model_Passive	5,266	6	0,510	0,242	8 cells (66,7%) have expected count less than 5. The minimum expected count is ,67.
Personality_binned * Self_efficacy	11,620	8	0,169	0,359	13 cells (86,7%) have expected count less than 5. The minimum expected count is ,27.
Personality_binned * Study_Unit	5,876	4	0,209	0,256	5 cells (55,6%) have expected count less than 5. The minimum expected count is ,67.
Personality_binned * Year	13,545	10	0,195	0,388	15 cells (83,3%) have expected count less than 5. The minimum expected count is ,27.

Based on Figure 5, positive entrepreneurial experience might help to accelerate students to start a business after graduation, while students with no entrepreneurial experience at all might take a longer time to prepare or might not be certain if they will become entrepreneurs.

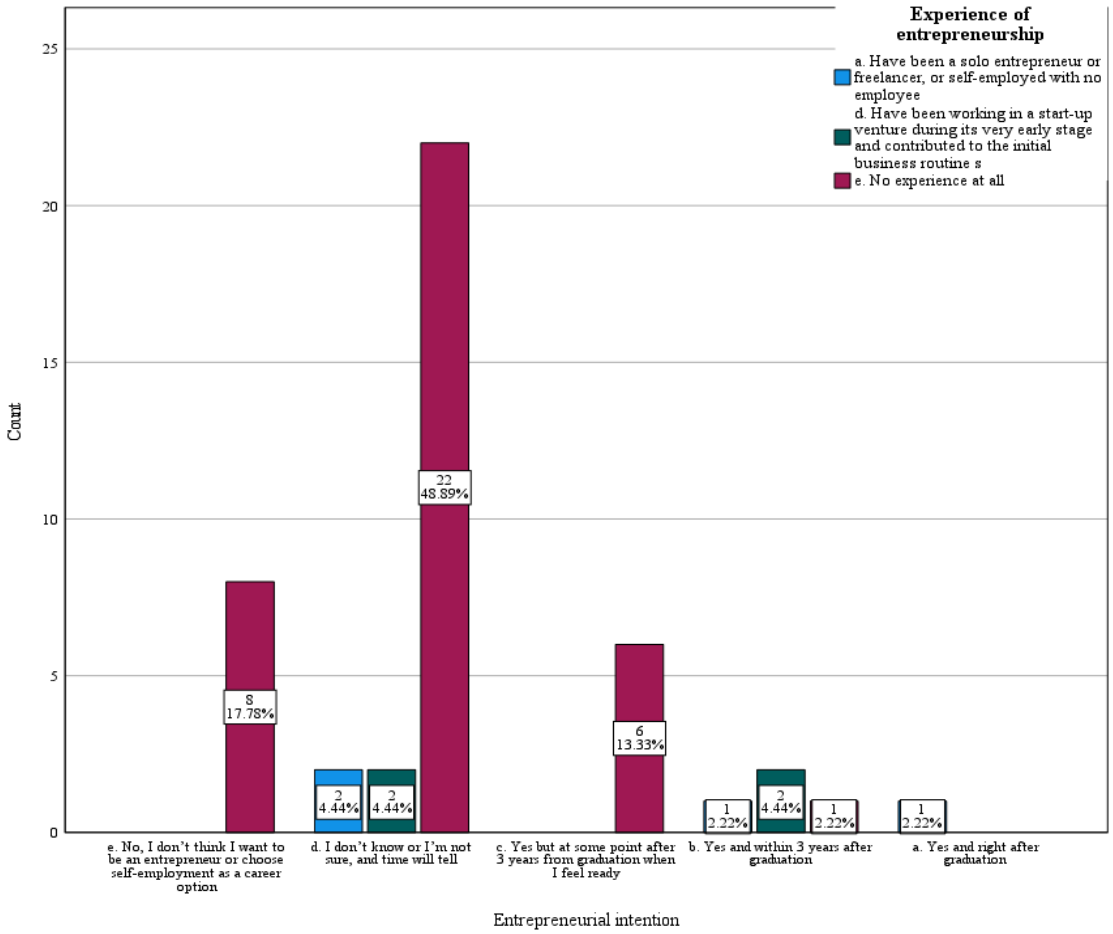

Figure 5. The association between entrepreneurial intention and entrepreneurial experience.

Based on Figure 6, students with entrepreneurial intention tend to follow the stories and activities of other entrepreneurs actively which act as role models to bring positive influence to themselves. While those with no entrepreneurial intention or not certain about going into entrepreneurship somehow tend not to actively follow other entrepreneurs' stories or activities.

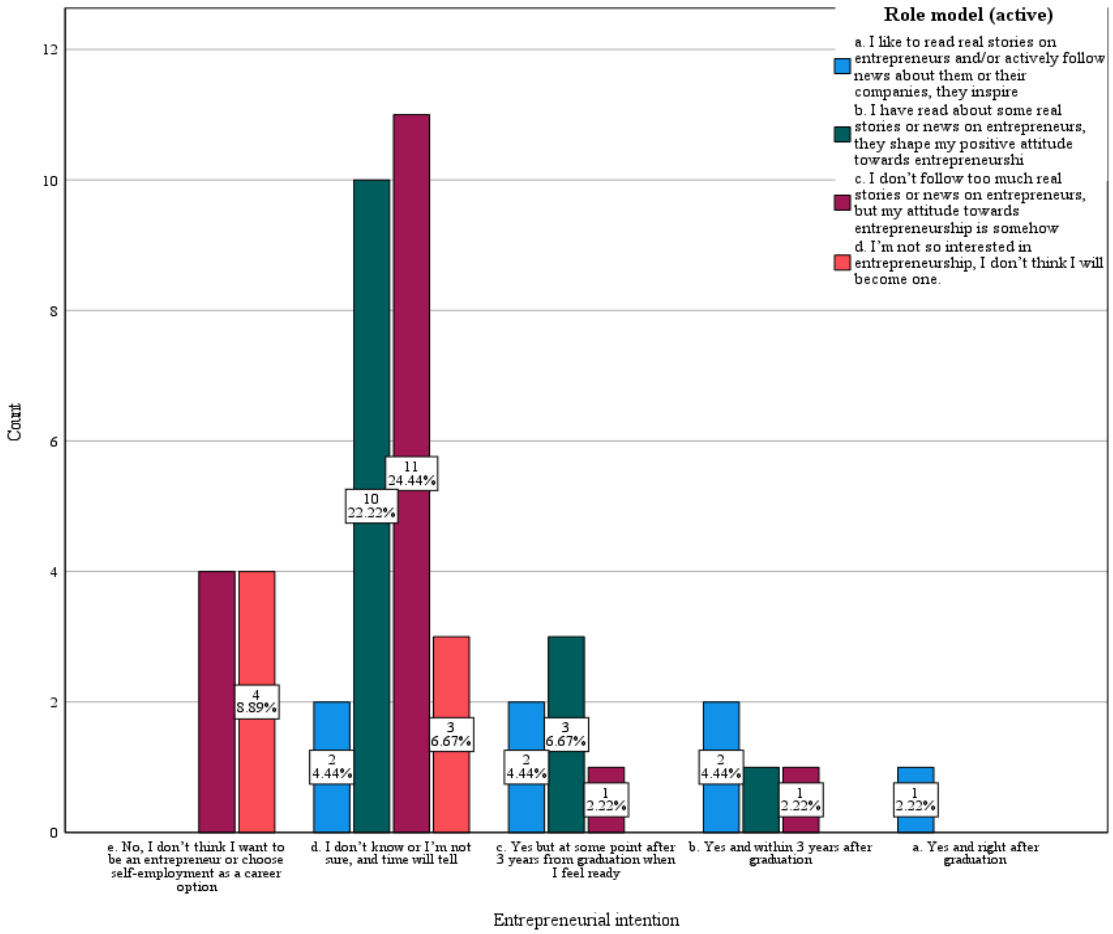

Figure 6. The association between entrepreneurial intention and influence of role model in an active way.

Based on Figure 7, it seems that the more confident the students are on their entrepreneurial competence, the stronger entrepreneurial intention they will have, and the sooner and more certain they would start their own business.

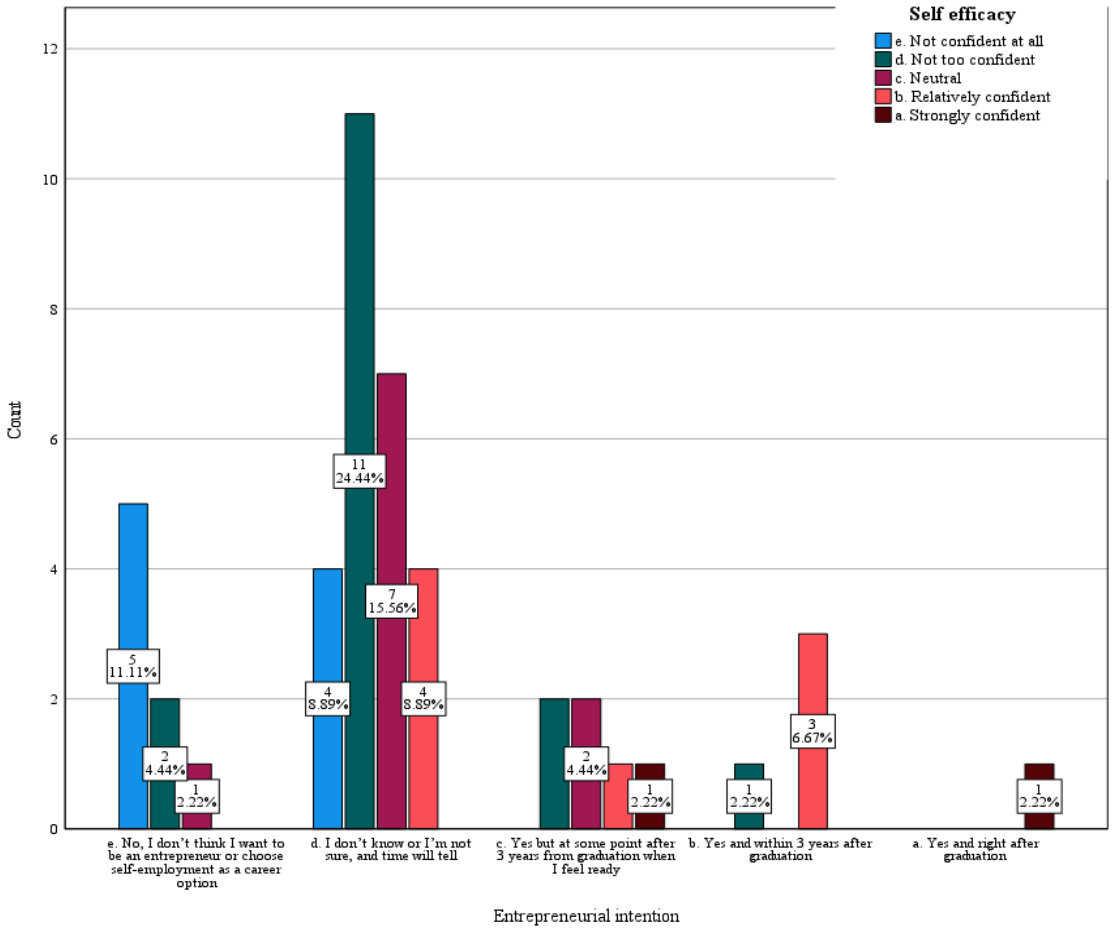

Figure 7. The association between entrepreneurial intention and self-efficacy.

Based on Figure 8, it seems that students with stronger entrepreneurial intention would like to learn for entrepreneurship, those with entrepreneurial intention but will need longer time to prepare would like to at least learn about, if not learn for, entrepreneurship. Students with no entrepreneurial intention or not certain about going into entrepreneurship tend to only learn about the topic either due to the knowledge and skill being needed, or due to the need to pass the course as it is mandatory, or they tend not to have any learning intention at all.

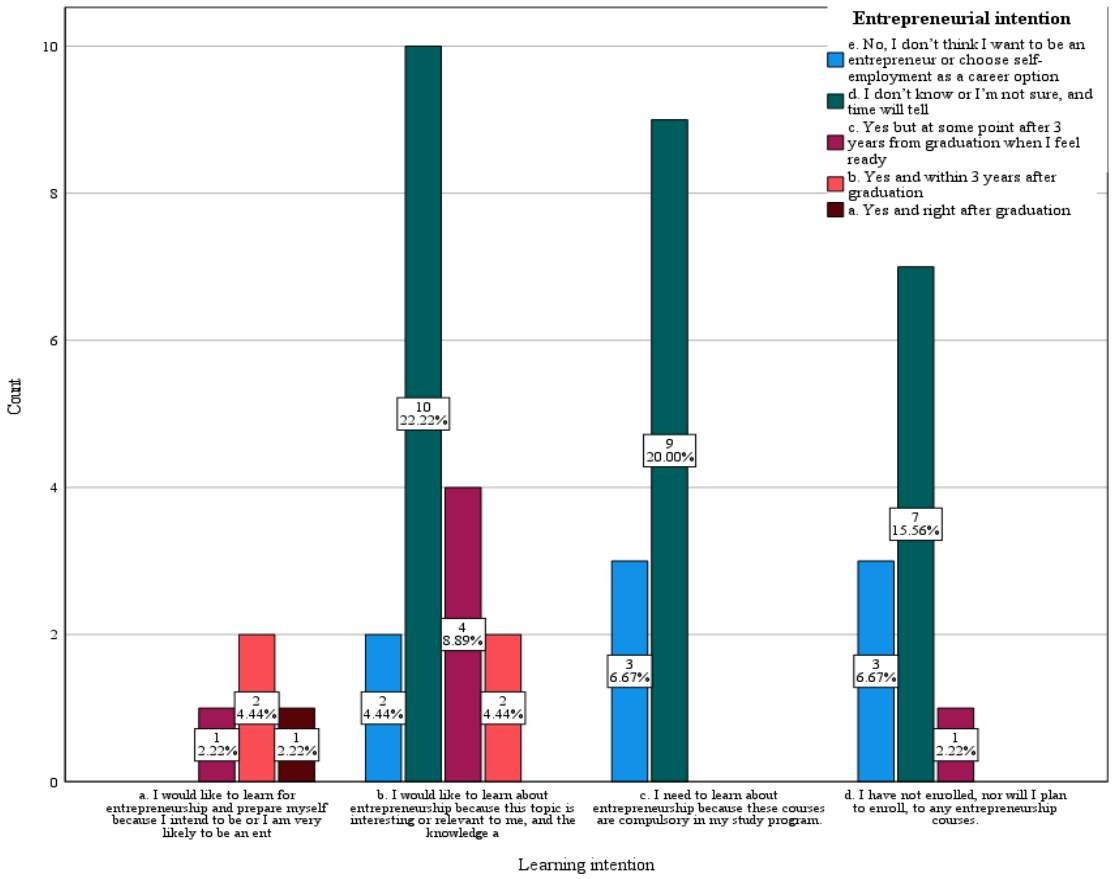

Figure 8. The association between entrepreneurial intention and learning intention.

Based on Figure 9, it seems that students with stronger entrepreneurial personality tend to have also stronger entrepreneurial intention and would like to start their own businesses sooner.

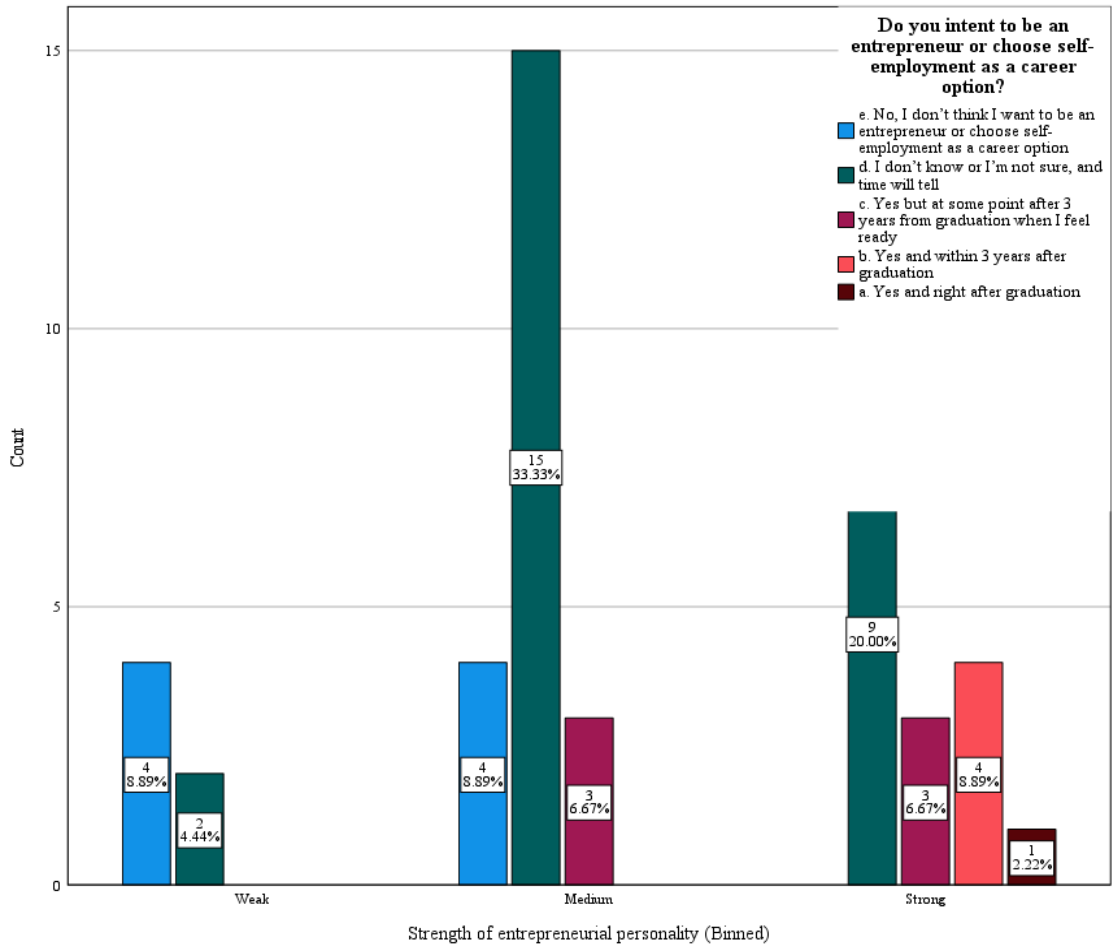

Figure 9. The association between entrepreneurial intention and strength of entrepreneurial personality.

Based on Figure 10, students' learning intention of entrepreneurship might increase if they would have entrepreneurial experience, and depending on how they percept their entrepreneurial experience, the purpose of their learning might vary.

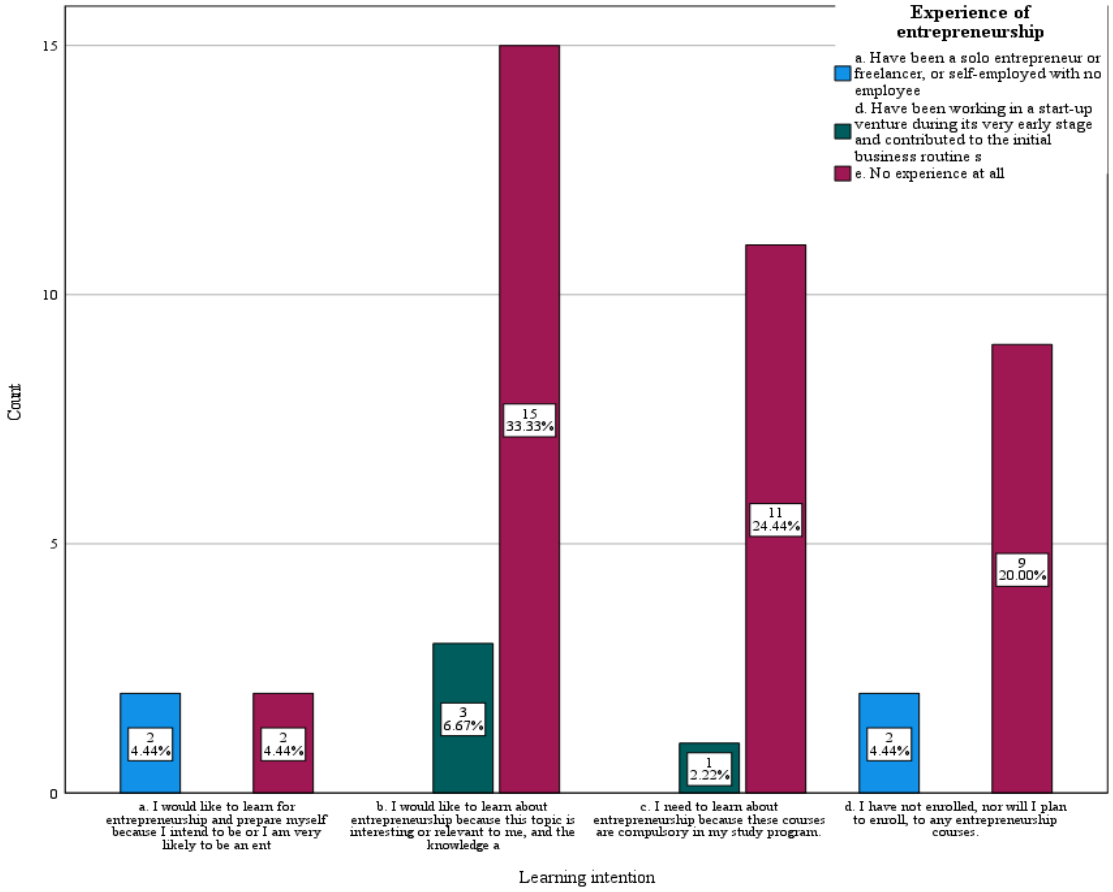

Figure 10. The association between learning intention and entrepreneurial experience.

Based on Figure 11, it seems that the more advocating entrepreneurial culture there would be in students' growth environment, the more students with stronger entrepreneurial personality would appear.

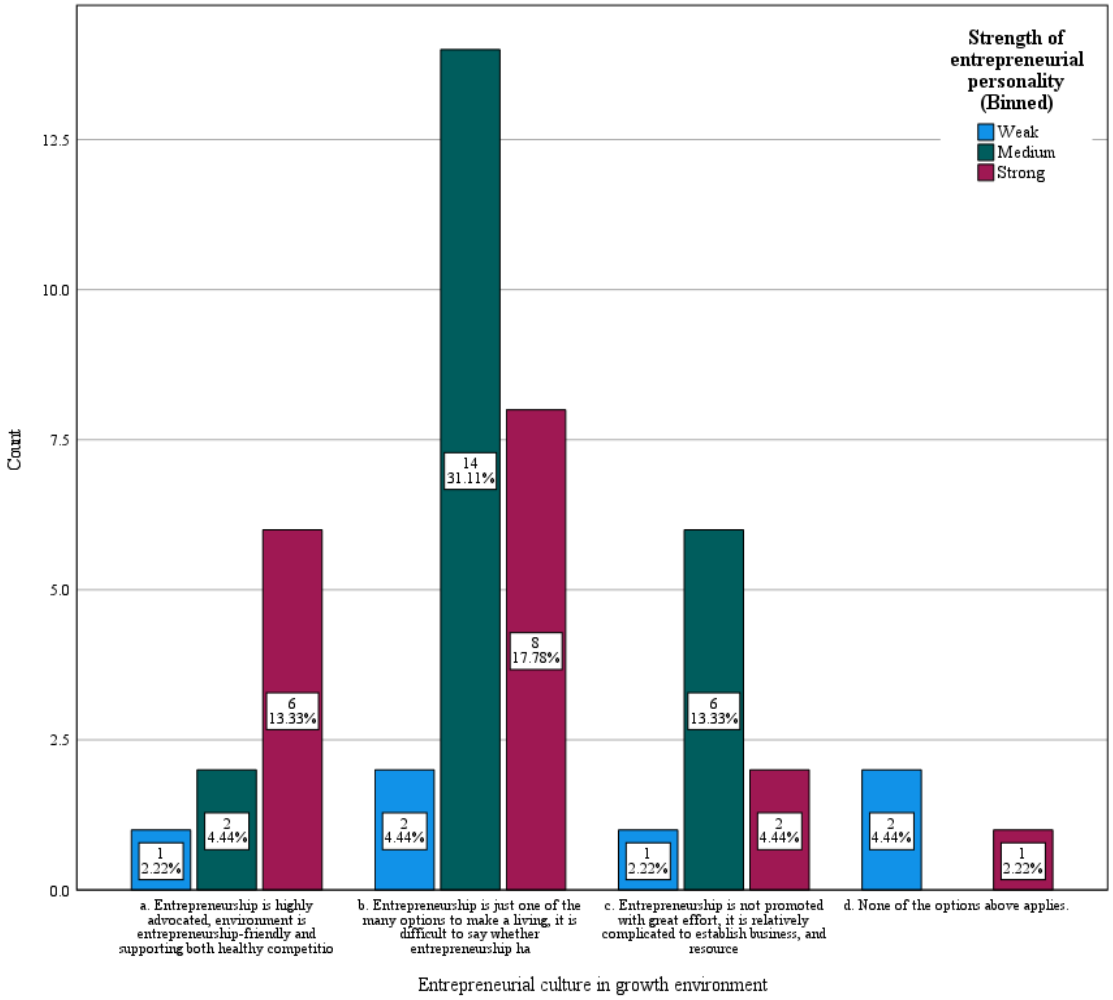

Figure 11. The association between entrepreneurial culture in growth environment and strength of entrepreneurial personality.

Based on Figure 12, it seems that the stronger entrepreneurial personality the students have, the more actively they would like to follow other entrepreneurs' stories and activities as role models.

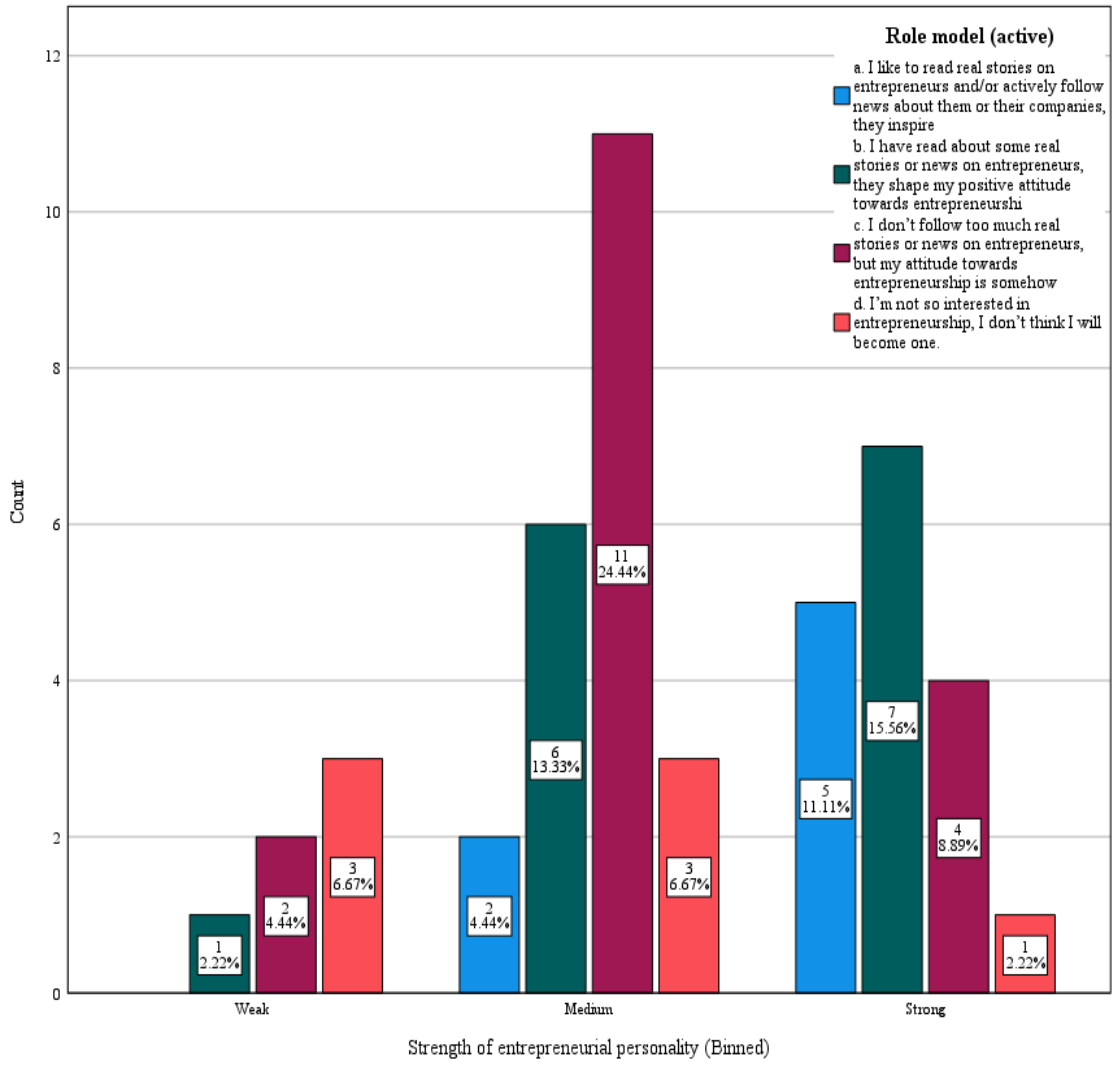

Figure 12. The association between strength of entrepreneurial personality and influence of role model in an active way.

Last but not least, when looking at students' orientation towards entrepreneurship (Table 3), fortunately only 6.7% of the sample shows somehow negative attitude towards entrepreneurship before coming to VAMK, while 55.6% of the sample has a neutral attitude meaning that there is an opportunity as well as challenge for VAMK to influence on a relatively large amount of students' attitude towards entrepreneurship positively. Among

the motivations for entrepreneurship, freedom seems to be the most common reason. Self-efficacy seems to be relatively weak among the students currently, the percentages of the sample that is strongly confident and relatively confident in their competence for successful entrepreneurship are only 4.4% and 17.8% respectively. Figure 13 visualizes the profile of students' perception on entrepreneurship. It seems that relatively less students percept entrepreneurship as an important way to meet some important societal demands and contribute to economic development and growth.

Table 3. Students' orientation towards entrepreneurship.

Sample characteristics (Orientation to Entrepreneurship)

Variable	Label (Questions in survey)	N	%
Previous_attitude	What was your attitude towards entrepreneurship before coming to VAMK?		
	d.Somehow negative	3	6,7%
	c.Neutral	25	55,6%
	b.Somehow positive	9	20,0%
	a.Very positive	8	17,8%
Motivation	Why do you intend to be an entrepreneur? Choose your most important motivation for entrepreneurship.		
	a.Prosperity	4	8,9%
	b.The need for personal achievement	7	15,6%
	c.Freedom	22	48,9%
	d.I have no motivation to be an entrepreneur	12	26,7%
Perception1	Identify, exploit and commercialize profitable opportunities	36	80.0%
Perception2	Solving real-world problems with innovations	37	82.2%
Perception3	Being proactive and taking risks	36	80.0%
Perception4	Having the competence to make decisions, acquire resources, and drive actions	39	86.7%
Perception5	An important way to meet some important societal demands and contribute to economic development and growth	29	64.4%
Self_efficacy	At the moment, how confident are you in your own competence to establish and run a business, and achieve the expected outcome successfully?		
	e.Not confident at all	9	20,0%
	d.Not too confident	16	35,6%
	c.Neutral	10	22,2%
	b.Relatively confident	8	17,8%
	a.Strongly confident	2	4,4%

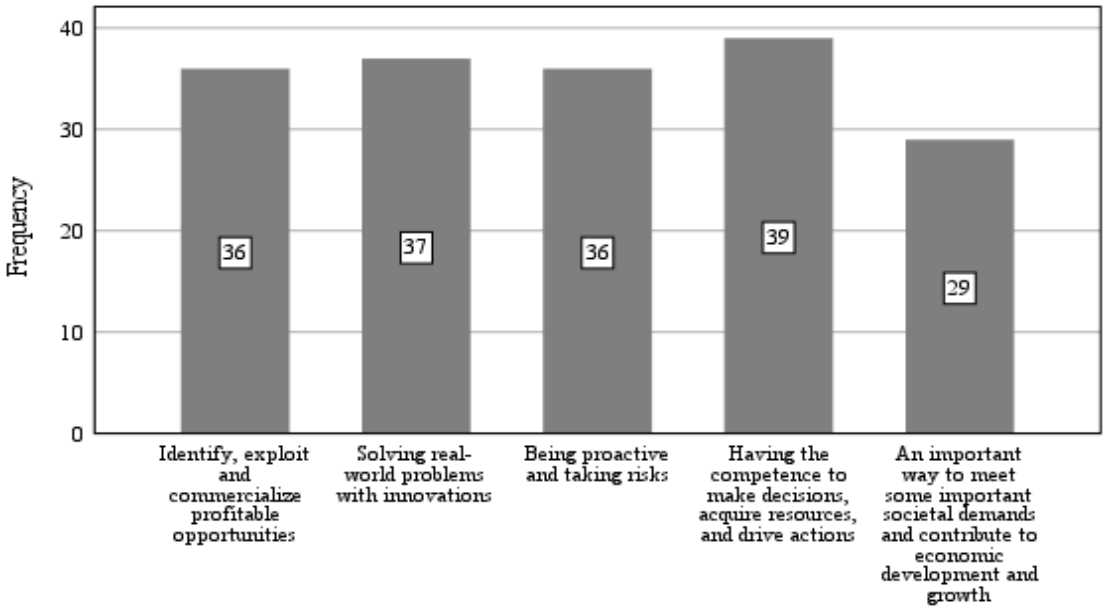

Figure 13. Profile of students' perception of entrepreneurship.

5.2 Fostering Factors for Entrepreneurship

Four fostering factors for entrepreneurship were extracted and the sub-sections below present the results as well as the different treatments and comparisons on both item and factorial levels; in the end, the effects of the elements from students' profiles on the factors were tested and discussed.

5.2.1 Factor analysis

After the first round of extraction, Competence2, Competence3, Competence17 were chosen to be excluded from the analysis due to communalities not larger than 0.5 (Marshall et al. 2016). In the second round of extraction, RS6, Competence1, Competence9 were excluded due to not being able to load on any factor, since all loadings less than 0,4 were suppressed in the output (Field 2005). In the third round of extraction, RS3 was also removed due to not being able to load on any factor. Finally, in the fourth round of extraction, no more variables needed to be excluded. Table 4 shows that all the retained items are having high communality values (larger than 0.5), indicating an adequate amount of variance for the common factors. The Kaiser-Meyer-Olkin (KMO) measure of sampling has a good value of 0.787 (Sofroniou & Hutcheson 1999, 224 - 225). The result

of Bartlett's test of sphericity (df=406, $p < 0.001$) indicates that the correlation matrix is very unlikely to be an identity matrix (correlations between variables are 0). Both tests, presented in Table 5, indicate that the data were appropriate for factor analysis, with a substantial amount of variance expected.

After extraction, the total cumulative variance explained by the four factors sums up to a 68.03% of variance, which is acceptable for the social sciences (Sparkman, Hair, Anderson, Tatham & Grablowsky 1979).

And after rotation, the sum of squared loadings of the first factor is 12.942, the second one is 7.89, the third one is 5.858 and the fourth one is 6.11. Both results are presented in Table 6.

Table 4. Communalities of retained items in the fourth round of extraction.

Communalities

	Initial	Extraction
Need_perception	0.878	0.638
Need_attitude	0.862	0.642
Need_motivation	0.794	0.592
Need_selfefficacy	0.844	0.718
Competence4	0.926	0.642
Competence5	0.841	0.569
Competence6	0.910	0.760
Competence7	0.900	0.716
Competence8	0.900	0.711
Competence10	0.916	0.685
Competence11	0.930	0.745
Competence12	0.877	0.613
Competence13	0.874	0.624
Competence14	0.873	0.543
Competence15	0.913	0.623
Competence16	0.896	0.758
Competence18	0.897	0.664
Competence19	0.954	0.739
Competence20	0.895	0.638
Experience1	0.838	0.696
Experience2	0.937	0.744
Experience3	0.953	0.886
Experience4	0.865	0.648
RS1	0.940	0.794
RS2	0.854	0.633
RS4	0.786	0.652
RS5	0.922	0.782
RS7	0.928	0.769
RS8	0.921	0.505

Table 5. The KMO and Bartlett's measures

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.787
Bartlett's Test of Sphericity	Approx. Chi-Square	1302.440
	df	406
	Sig.	<0,001

Table 6. Cumulative variance explained.

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	14,636	50,470	50,470	14,322	49,385	49,385	12,942
2	2,336	8,055	58,526	2,078	7,166	56,551	7,890
3	2,179	7,514	66,040	1,843	6,357	62,908	5,858
4	1,807	6,232	72,272	1,485	5,122	68,030	6,110

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

The factor loadings are shown in Table 7. All items are loaded on a single factor showing a simple structure, except only RS5 has cross-loadings on factor 2 and factor 4. After examination of the content of the items loaded to different factors, it appears appropriate that the first factor corresponds to entrepreneurial competence – one of the two enabling factors, the second factor corresponds to entrepreneurial experience – the other enabling factor, the third factor corresponds to the core mental and psychological factor, the fourth factor corresponds to resource and support as the catalytic factor. It is more reasonable to set RS5 (Clear referral or other measures that facilitate networking and collaborations with other financial and business sectors) as belonging to the fourth factor (Resource and support), despite having a lowering loading (0.418). While worth of notice, RS1 (Platforms for teambuilding) seems to be expected as an experience instead of as a resource and support by the students. The extracted factors are aligned with the factors in term of both content and structure in the model shown in Figure 1.

The factor analysis result is proved to be valid and reliable. Because the average loadings of each factor are larger than 0.5, all factors are considered significant (Hair, Black, Babin & Anderson 2009), indicating satisfactory validity. High discriminate validity is also supported by the fact that all factor correlations are less than 0.8 (Costello & Osborne 2005)

as shown in Table 8. Cronbach's alpha coefficient was computed to evaluate the reliability of the factors (also in Table 8). All the factors show high reliability with all Alpha coefficients larger than 0.8, meaning that the items loaded to the same factors were having a high degree of internal consistency (Marshall et al. 2016).

Items loaded to each factor were averaged into new composite variables with a summative scale for further analysis. The descriptive statistics of the composite variables are presented in Table 9.

Table 7. Factor loadings in pattern matrix.

Pattern Matrix[a]

	Factor			
	1	2	3	4
Competence19	0.871			
Competence6	0.842			
Competence8	0.812			
Competence7	0.806			
Competence16	0.804			
Competence15	0.778			
Competence10	0.755			
Competence4	0.707			
Competence5	0.704			
Competence20	0.698			
Competence12	0.692			
Competence14	0.690			
Competence18	0.675			
Competence11	0.654			
Competence13	0.630			
Experience3		0.894		
RS1		0.809		
Experience2		0.793		
Experience1		0.697		
Experience4		0.586		
RS5		0.550		0.418
Need_selfefficacy			0.801	
Need_attitude			0.734	
Need_motivation			0.709	
Need_perception			0.695	
RS7				0.828
RS4				0.785
RS8				0.579
RS2				0.519

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization. [a]

[a]. Rotation converged in 5 iterations.

Table 8. Cronbach's alpha coefficient and factor correlation matrix

Reliabilities and Factor Correlation Matrix

Factor	Cronbach's α	N of items	1	2	3	4
1 Competence	0,962	15	1,000			
2 Experience	0,925	5	0,498	1,000		
3 Core factor	0,876	4	0,437	0,267	1,000	
4 Resource and support	0,868	5	0,475	0,308	0,213	1,000

Extraction Method: Principal Axis Factoring.

Table 9. Descriptive statistics of the composite variables for entrepreneurship fostering factors.

Descriptive Statistics

	N	Minimum	Maximum	Mean	SD
Core_factors	45	1,00	5,00	3,45	1,064
Competence_factors	45	1,00	5,00	4,08	0,854
Experience_factors	45	1,00	5,00	3,49	1,058
RS_factors	45	1,00	5,00	3,53	0,985

5.2.2 Repeated-measures ANOVA to test the difference among the items loaded to each extracted factor

Table 10 shows the Mauchly's test of Sphericity for the items loaded to each extracted factor. Results for "competence" and "resource & support" are statistically significant (p = 0.000 and p = 0.004 respectively), meaning that variances of the differences among the items loaded to these two factors are not equal in the population, hence Epsilon values are used to decide which ANOVA result should be reported to ensure validity. With Greenhouse-Geisser Epsilon for "competence" is 0.605, less than 0.75, ANOVA result under Greenhouse-Geisser is reported (see Table 11). While Greenhouse-Geisser Epsilon for "resource & support" is 0.759, larger than 0.75, ANOVA result under Huynh-Feldt is reported (see Table 11). (Howell 2002; Field 2013.)

Table 10. Mauchly's test of Sphericity for the items loaded to each extracted factor

Mauchly's Test of Sphericity
Measure: Importance

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon Greenhouse-Geisser	Epsilon Huynh-Feldt	Epsilon Lower-bound
Core factor	0,888	5,072	5	0,407	0,928	0,997	0,333
Competence	0,007	196,407	104	0,000	0,605	0,762	0,071
Experience	0,734	13,108	9	0,158	0,886	0,973	0,250
Resource & support	0,562	24,465	9	0,004	0,759	0,821	0,250

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

Based on Table 11, for all extracted factors, there are statistically significant difference among the items that are loaded to them (core factor: $F(3,132) = 4.318$, $p = 0.006$; competence: $F(8.467, 372.56) = 10.225$, $p = 0.000$; experience: $F(4, 176) = 3.408$, $p = 0.010$; resource and support: $F(3.285, 144.520) = 6.785$, $p = 0.000$). Partial eta-squared (η^2) for "core factor", "experience" and "resource & support" are 0.089, 0.072 and 0.134 respectively, indicating a medium (larger than 0.059) effect size of the difference among items loaded to these three factors, while 0.189 as the value of η^2 for "competence" indicates a large effect size (larger than 0.138) (Marshall et al. 2016).

Table 11. ANOVA results for the items loaded to each extracted factor

Tests of Within-Subjects Effects
Measure: Importance

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Core factor	Sphericity Assumed	7,261	3	2,420	4,318	0,006	0,089
Error	Sphericity Assumed	73,989	132	0,561			
Competence	Greenhouse-Geisser	59,061	8,467	6,975	10,225	0,000	0,189
Error	Greenhouse-Geisser	254,139	372,560	0,682			
Experience	Sphericity Assumed	5,751	4	1,438	3,408	0,010	0,072
Error	Sphericity Assumed	74,249	176	0,422			
Resource & support	Huynh-Feldt	17,422	3,285	5,304	6,785	0,000	0,134
Error	Huynh-Feldt	112,978	144,520	0,782			

In order to identify where the statistically significant differences are located, Post hoc tests were run for each factor and the results are presented from Table 12 to Table 16. For items loaded to core factor, entrepreneurial motivation is significantly more important than self-efficacy. For items loaded to competence factor, decision-making, problem-

solving, together with adeptness/flexibility are significantly more important than cognition/analysis, resource utilization/configuration and new product/service prototyping/development. For items loaded to experience factor, co-operation with local businesses regarding real-life project work or guest lecturing is significantly more important than team building. For items loaded to resource and support factor, practical information that is highly relevant for starting a business and legal/business consultancy are significantly more important than all other items.

Table 12. Post hoc tests among items loaded to core factor.

Core factor	Mean
Need_motivation*	3,756
Need_perception	3,467
Need_attitude	3,378
Need_self efficacy*	3,200

*. Mean difference between items highlighted by different colors is significant at the 0,05 level.

Table 13. Post hoc tests among items loaded to competence factor.

Competence	Mean
Decision making*	4,467
Problem solving*	4,467
Adeptness and flexibility*	4,378
Teamwork	4,311
Strategic thinking	4,222
Creative thinking	4,156
Opportunity recognition and evaluation	4,156
Networking	4,156
Risk management	4,089
Business planning and organizing	4,000
Relationship handling, stakeholder management and communication	4,000
Self-directed / spontaneous learning	3,978
Cognition and analysis*	3,844
Resource utilization and configuration*	3,600
New product / service prototyping and development*	3,356

*. Mean difference between items highlighted by different colors is significant at the 0,05 level.

Table 14. Post hoc tests among items loaded to experience factor.

Experience	Mean
Co-operate with local businesses regarding real-life project work or guest lecturing, etc*	3,667
Mentoring or coaching programs	3,644
Promote open innovation or the development of new solutions for existing challenges via close and diverse collaboration with government, industry and other knowledge institutions	3,467
Simulate entrepreneurship process with experiential learning activities or other events	3,467
Platforms for teambuilding*	3,222

*. Mean difference between items highlighted by different colors is significant at the 0,05 level.

Table 15. Post hoc tests among items loaded to resource and support factor.

Resource and support	Mean
Practical information that is highly relevant for starting a business*	3,956
Legal and business consultancy*	3,778
Facility such as office or laboratory space, IT and administrative service*	3,333
Clear referral or other measures that facilitate networking and collaborations with other financial and business sectors*	3,311
Initial fund or other financing possibilities for entrepreneurship*	3,289

*. Mean difference between items highlighted by different colors is significant at the 0,05 level.

5.2.3 Repeated-measures ANOVA to test the difference among the extracted factors

Since the result of Mauchly's test of Sphericity is insignificant when p = 0.122 (Table 16), indicating that it is the variances of the difference among the extracted factors are equal in the population, it is valid to report the ANOVA result assuming sphericity (Table 17) (Howell 2002; Field 2013), which indicates large ($\eta^2 = 0.161$) statistically significant difference among the extracted factors (F(3, 132) = 8.456, p = 0.000). Post hoc test result shown in Table 18 suggests that competence is significantly more important than the other three entrepreneurship fostering factors. Figure 14 illustrates the mean comparison among the four factors.

Table 16. Mauchly's test of Sphericity for the extracted factors

Mauchly's Test of Sphericity
Measure: Importance

					Epsilon		
Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Greenhouse-Geisser	Huynh-Feldt	Lower-bound
4 new constructed factors	0,816	8,693	5	0,122	0,888	0,950	0,333

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

Table 17. ANOVA results for the extracted factors

Tests of Within-Subjects Effects
Measure: Importance

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
4 new constructed factors	Sphericity Assumed	11,758	3	3,919	8,456	0,000	0,161
Error	Sphericity Assumed	61,177	132	0,463			

Table 18. Post hoc tests among extracted factors.

Descriptive Statistics

	Mean	Std. Deviation	N
Core_factors	3,4500	1,06414	45
Competence_factors*	4,0785	0,85426	45
Experience_factors	3,4933	1,05796	45
RS_factors	3,5333	0,98535	45

***.** Mean difference with other items is significant at the 0,05 level.

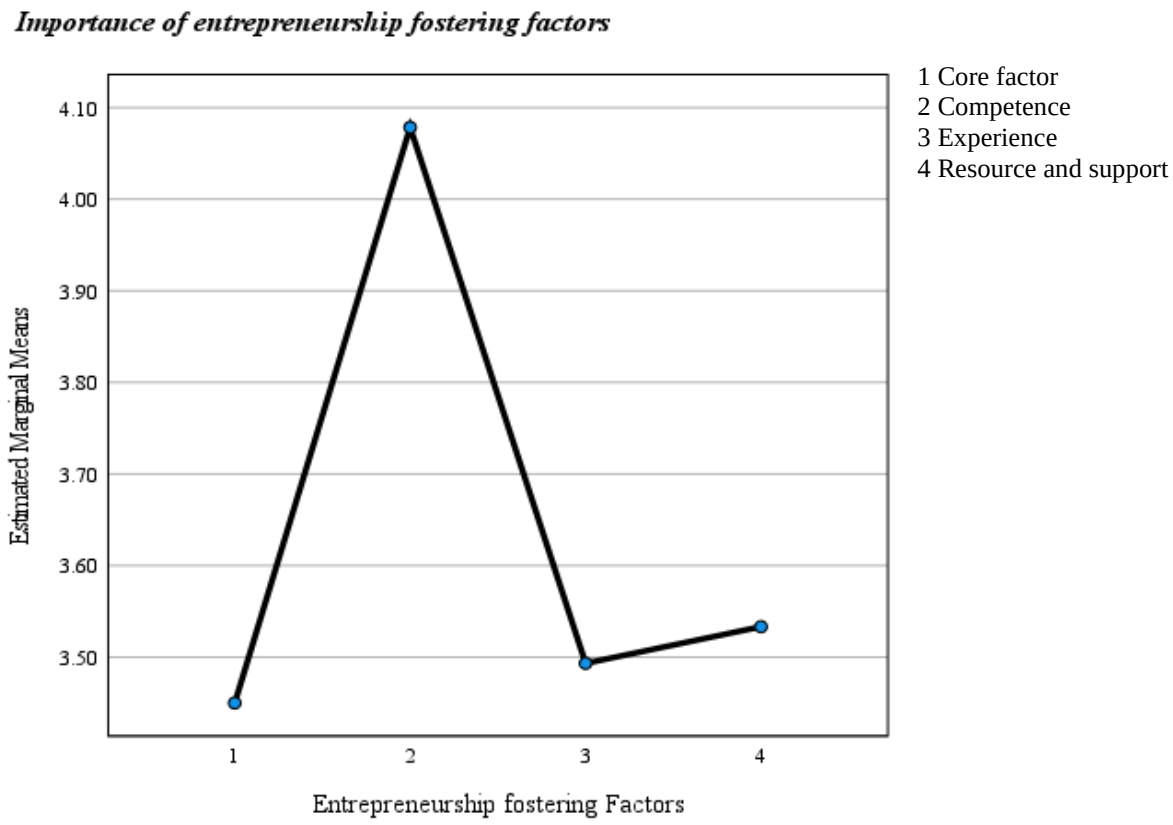

Figure 14. Means of the 4 extracted factors.

5.2.4 Factorial repeated-measures ANOVA to test the effect of students' profiles on the difference among the extracted factors

Based on Table 19, only the interaction effect between gender and factor is statistically significant (p = 0.046), showing that the patterns of the difference among the extracted factors are clearly different for male and female students, so the test of the difference among the extracted factors for male and female was run separately to obtain further detail. On the other hand, although the interaction effect between study year and factor is statistically insignificant (p = 0.110), the effect size is large with a value of partial Eta squared at 0.163, it is worth of further research on more adequate data.

Table 20 presents the ANOVA results for the extracted factors separately run by gender. Mauchly's tests of Sphericity for both groups are insignificant (p = 0.465 for male and p = 0.145 for female) meaning that it is valid to report the ANOVA result assuming sphericity. The result indicates that there are large (η^2 = 0.158 for male and η^2 = 0.254 for

female) statistically significant difference among the extracted factors in each gender group (Male: F(3, 69) = 4.312, p = 0.008; Female: F(3, 60) = 6.798, p = 0.001), which is aligned with the previous general ANOVA result without any separate runs on subgroups. The result also shows that the difference among the extracted factors in female students is larger than that in male students. Post hoc test result shown in Table 21 suggests that competence is significantly more important than the other three entrepreneurship fostering factors for female students, which shares the same pattern as the previous general ANOVA result, while for male students, the significant difference is only found between competence and experience factors, with competence as the most important factor and experience as the least important factors. Figure 15 illustrates the mean comparison among the four factors for each gender group. As seen, the patterns of the difference among the extracted factors are not the same for male and female students.

Table 19. Test of interaction effects of variables from students' profiles on the extracted factors

Factorial ANOVA - Tests of Interaction Effects
Measure: Importance

Source	df	F	Sig.	Partial Eta Squared
factor * Region	3	0,703	0,552	0,016
factor * Gender	3	2,743	0,046	0,060
factor * Study_Unit	6	1,174	0,324	0,053
factor * Year	15	1,516	0,110	0,163
factor * E_experience	6	1,498	0,184	0,067
factor * Personality_binned	6	0,509	0,800	0,024
factor * Culture[a]	8,755	1,221	0,289	0,082
factor * Role_model_Passive	9	1,141	0,339	0,077
factor * Role_model_Active	9	1,746	0,086	0,113
factor * Learning_intention	9	0,703	0,705	0,049
factor * Entrepreneurial_intention	12	0,319	0,985	0,031

a. Sphericity not assumed. Based on result of Mauchly's Test of Sphericity, values under Huynh-Feldt are reported.

Table 20. ANOVA results for the extracted factors separately run by gender

	Mauchly's Test of Sphericity[a]					ANOVA - Tests of Within-Subjects Effects[b]				
Gender	Within Subjects	Mauchly's W	Approx. Chi-Square	df	Sig.	df 1	df 2	F	Sig.	Partial Eta Squared
a. Male	factor	0,809	4,616	5	0,465	3	69	4,312	0,008	0,158
b. Female	factor	0,645	8,223	5	0,145	3	60	6,798	0,001	0,254

a. Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

b. Sphericity Assumed

Table 21. Post hoc tests among extracted factors separately run by gender

Gender	(I) factor	(J) factor	Mean Difference	Std. Error	Sig.[b]
a.Male	2	1	0,374	0,171	0,235
		3	0.647*	0,189	0,014
		4	0,339	0,138	0,134
b.Female	2	1	0.919*	0,212	0,002
		3	0.514*	0,165	0,032
		4	0.781*	0,188	0,003

Based on estimated marginal means

*. The mean difference is significant at the ,05 level.

b. Adjustment for multiple comparisons: Bonferroni.

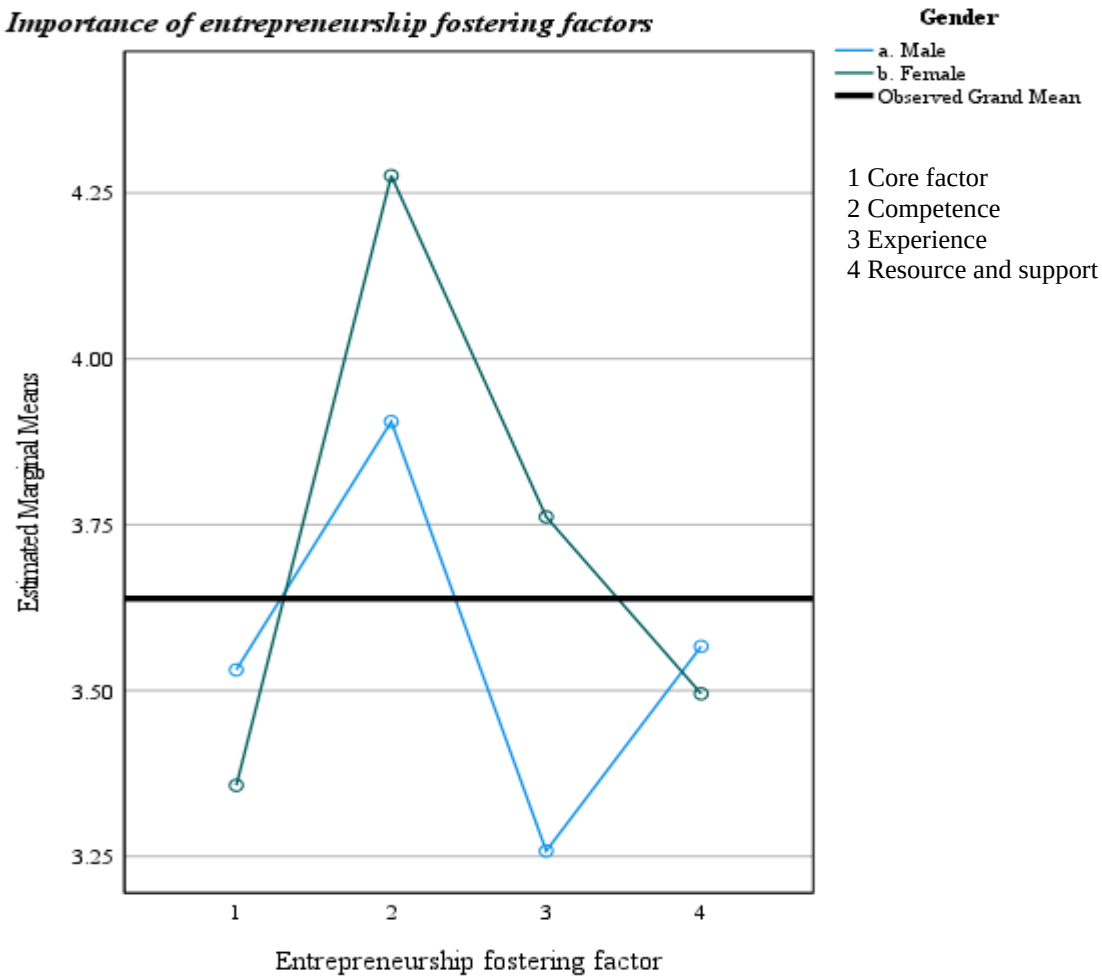

Figure 15. Means of the 4 extracted factors by gender.

The factorial ANOVA result as shown in Table 22 presents the effects of variables from students' profiles on the difference among the extracted factors. Study unit, entrepreneurial personality, entrepreneurial culture in growth environment, influence of role model in an active way, and entrepreneurial intention are having a statistically significant effect with all p-values less than 0.05. But when checking the result of Box's test, the observed covariance matrices of the extracted factors are not equal across subgroups by entrepreneurial personality, entrepreneurial culture in growth environment, and influence of role model in an active way with p-values less than 0.05. Also when further running post hoc tests to identify where the differences are located, it appears that for entrepreneurial culture in growth environment and influence of role model in an active way as the grouping variables, only the "none" subgroup is significantly different from other subgroups, indicating less worth of further investigation since differences among other subgroups are

insignificant; also for entrepreneurial intention as the grouping variable, a significant difference is found between a one-case subgroup and other subgroups, which indicates an unreliable outlier situation. So based on all mentioned above, only the effect of study unit on the difference among the extracted factors is valid ($F(2) = 3.127$, $p = 0.054$). Though it does not pass the Box's test of equality of covariance matrices ($p = 0.001$) resulting in a questionable validity of its effect on the difference among the extracted factors ($F(2) = 4.09$, $p = 0.024$), due to the large effect size of entrepreneurial personality ($\eta^2 = 0.163$), it is still worth of further checking, considering that this might be due to the small sample size in this research. In all, study unit and entrepreneurial personality were chosen for further investigation for how they affect the difference among the extracted factors.

Post hoc tests (Table 23) from the factorial ANOVA show that the effect of study unit is located in experience factor, with a statistically significant difference between the subgroups of school of technology and school of health care and social services ($p = 0.035$). The effect of entrepreneurial personality, on the other hand, is on these three factors - competence, experience, and resource/support, all with statistically significant differences between the subgroups of weak and strong entrepreneurial personality ($p = 0.008$ for competence, $p = 0.014$ for experience, and $p = 0.011$ for resource/support). Based on this, the effect of study unit on experience factor, and the effect of entrepreneurial personality on competence factor, experience factor, and resource/support factor will be tested by one-way ANOVA to check whether there is any other difference among all the subgroups.

Table 22. Factorial ANOVA results for the extracted factors

Factorial ANOVA - Tests of Between-Subjects Effects					Box's Test[a]	
Source	df	F	Sig.	Partial Eta Squared	F	Sig.
Region	1	0,176	0,677	0,004	0,823	0,607
Gender	1	0,426	0,517	0,010	0,596	0,818
Study_Unit	2	3,127	0,054	0,130	1,364	0,135
Year	5	1,237	0,311	0,137	1,604	0,020
E_experience	2	0,213	0,809	0,010		
Personality_binned	2	4,090	0,024	0,163	2,257	0,001
Culture[b]	3	5,066	0,004	0,270	1,620	0,041
Role_model_Passive	3	1,733	0,175	0,113	1,076	0,358
Role_model_Active[b]	3	4,227	0,011	0,236	1,459	0,052
Learning_intention	3	0,749	0,529	0,052	1,416	0,103
Entrepreneurial_intention[c]	4	3,183	0,023	0,241	1,418	0,105

a. Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

b. 'None' subgroup is significantly different from other subgroups, not worth of further investigation.

c. One subgroup with only one case is significantly different from other subgroups, not worth of further investigation.

Empty cells: Box's Test of Equality of Covariance Matrices is not computed because there are fewer than two nonsingular cell covariance matrices.

Table 23. Post hoc tests based on the factorial ANOVA results for the extracted factors

Parameter Estimates

Dependent Variable	Parameter	B	t	Sig.	Partial Eta Squared
Experience_factors	Intercept	4,280	9,378	0,000	0,677
	School of Technology	-1,110	-2,175	0,035	0,101
	School of Business	-0,660	-1,293	0,203	0,038
	School of Health Care and Social Services	0[a]			
Competence_factors	Intercept	4,314	22,156	0,000	0,921
	Weak Entrepreneurial Personality	-1,058	-2,776	0,008	0,155
	Medium Entrepreneurial Personality	-0,193	-0,743	0,462	0,013
	Strong Entrepreneurial Personality	0[a]			
Experience_factors	Intercept	3,894	16,006	0,000	0,859
	Weak Entrepreneurial Personality	-1,227	-2,577	0,014	0,137
	Medium Entrepreneurial Personality	-0,485	-1,497	0,142	0,051
	Strong Entrepreneurial Personality	0[a]			
RS_factors	Intercept	3,847	17,006	0,000	0,873
	Weak Entrepreneurial Personality	-1,180	-2,665	0,011	0,145
	Medium Entrepreneurial Personality	-0,320	-1,062	0,294	0,026
	Strong Entrepreneurial Personality	0[a]			

a. This parameter is set to zero because it is redundant.

5.2.5 One-way ANOVA to test the effects of study unit and entrepreneurial personality on each relevant factor.

As seen from Table 24, although significant differences among the three subgroups (weak, medium and strong) in entrepreneurial personality are observed in competence ($F(2,42) = 3.914$, $p = 0.028$), experience ($F(2,42) = 3.472$, $p = 0.040$), and resource/support ($F(2,42) = 3.552$, $p = 0.038$), which is in line with the previous result, it is worth of running a nonparametric test (Welch test) as a reference because the results of Levene's tests are all significant (p-values less than 0.05) in the case of entrepreneurial personality, indicating that the equality of variances among the subgroups is not presumed. Meanwhile, with the equality of variances among the three subgroups presumed ($p = 0.073$ in Levene's test), the effect of study unit on experience factor turns out to be insignificant ($F(2,42) = 2.643$, $p = 0.083$), which contradicts the previous result. Welch test was also run in this case as a reference.

Table 24. ANOVA results for the relevant extracted factors grouped by entrepreneurial personality and study unit

				Tests of Homogeneity of Variance		*ANOVA*		
Grouping variables	Dependent variables	df1	df2	Levene Statistic[a]	Sig.	F	Sig.	Eta-squared[b]
Personality_binned	Core_factors	2	42	14,779	0,000	0,703	0,501	0,032
	Competence_factors	2	42	19,432	0,000	3,914	0,028	0,157
	Experience_factors	2	42	4,775	0,014	3,472	0,040	0,142
	RS_factors	2	42	4,524	0,017	3,552	0,038	0,145
Study_Unit	Experience_factors	2	42	2,793	0,073	2,643	0,083	0,112

a. Based on Mean.
b. Eta-squared is estimated based on the fixed-effect model.

Table 25 presents the results of Welch test, which indicate totally opposite findings from that of one-way ANOVA, unfortunately. Based on this test, there is not enough evidence for entrepreneurial personality to have an effect on any factor, while study unit does have an effect on experience factor ($p = 0.005$).

To find out where the difference is located, Tukey HSD post hoc test was run among different entrepreneurial personality subgroups for competence, experience, and resource/support factors as the effect is significant based on one-way ANOVA result, while Games-Howell post hoc test was run among different study unit subgroups for experience

factor as the effect is significant based on Welch test result. As shown in Table 26, the significant difference is located between weak and strong entrepreneurial personality sub-groups for the three relevant factors – students with strong entrepreneurial personality consider the importance of these factors to a higher extent than students with weak entrepreneurial personality do. For the effect of study unit, the significant difference is located between school of technology and school of health care and social service for experience factor – students from school of health care and social service consider the importance of experience to a higher extent than students from school of technology do (Table 27). Figure 16 and 17 illustrate these findings with the mean comparison among the four factors by study unit and entrepreneurial personality.

Table 25. Welch test results for the relevant extracted factors grouped by entrepreneurial personality and study unit

Robust Tests of Equality of Means

Grouping variable	Dependent variables	Welch Statistic[a]	df1	df2	Sig.
Personality_binned	Core_factors	0,294	2	11,759	0,751
	Competence_factors	1,371	2	11,944	0,291
	Experience_factors	2,350	2	12,488	0,136
	RS_factors	1,858	2	11,990	0,198
Study_Unit	Experience_factors	7,419	2	17,888	0,005

a. Asymptotically F distributed.

Table 26. Post hoc tests among different entrepreneurial personality subgroups for the relevant extracted factors

Post Hoc Tests (Tukey HSD)

Dependent Variable	(I) Personality_binned	(J) Personality_binned	Mean Difference (I-J)	Std. Error	Sig.
Competence_factors	Weak	Medium	-0,86566	0,36972	0,061
		Strong	-1.05817*	0,38119	0,022
	Medium	Weak	0,86566	0,36972	0,061
		Strong	-0,19251	0,25922	0,740
	Strong	Weak	1.05817*	0,38119	0,022
		Medium	0,19251	0,25922	0,740
Experience_factors	Weak	Medium	-0,74242	0,46199	0,254
		Strong	-1.22745*	0,47633	0,035
	Medium	Weak	0,74242	0,46199	0,254
		Strong	-0,48503	0,32392	0,302
	Strong	Weak	1.22745*	0,47633	0,035
		Medium	0,48503	0,32392	0,302
RS_factors	Weak	Medium	-0,86061	0,42958	0,124
		Strong	-1.18039*	0,44291	0,029
	Medium	Weak	0,86061	0,42958	0,124
		Strong	-0,31979	0,30120	0,543
	Strong	Weak	1.18039*	0,44291	0,029
		Medium	0,31979	0,30120	0,543

*. The mean difference is significant at the 0.05 level.

Table 27. Post hoc tests among different study unit subgroups for experience factor

Post Hoc Tests (Games-Howell)

Dependent Variable	(I) Study_Unit	(J) Study_Unit	Mean Difference (I-J)	Std. Error	Sig.
Experience_factors	a.School of Technology	b.School of Business	-0,45000	0,33597	0,384
		c.School of Health Care and Social Services	-1.11000*	0,28347	0,005
	b.School of Business	a.School of Technology	0,45000	0,33597	0,384
		c.School of Health Care and Social Services	-0,66000	0,34253	0,159
	c.School of Health Care and Social Services	a.School of Technology	1.11000*	0,28347	0,005
		b.School of Business	0,66000	0,34253	0,159

*. The mean difference is significant at the 0.05 level.

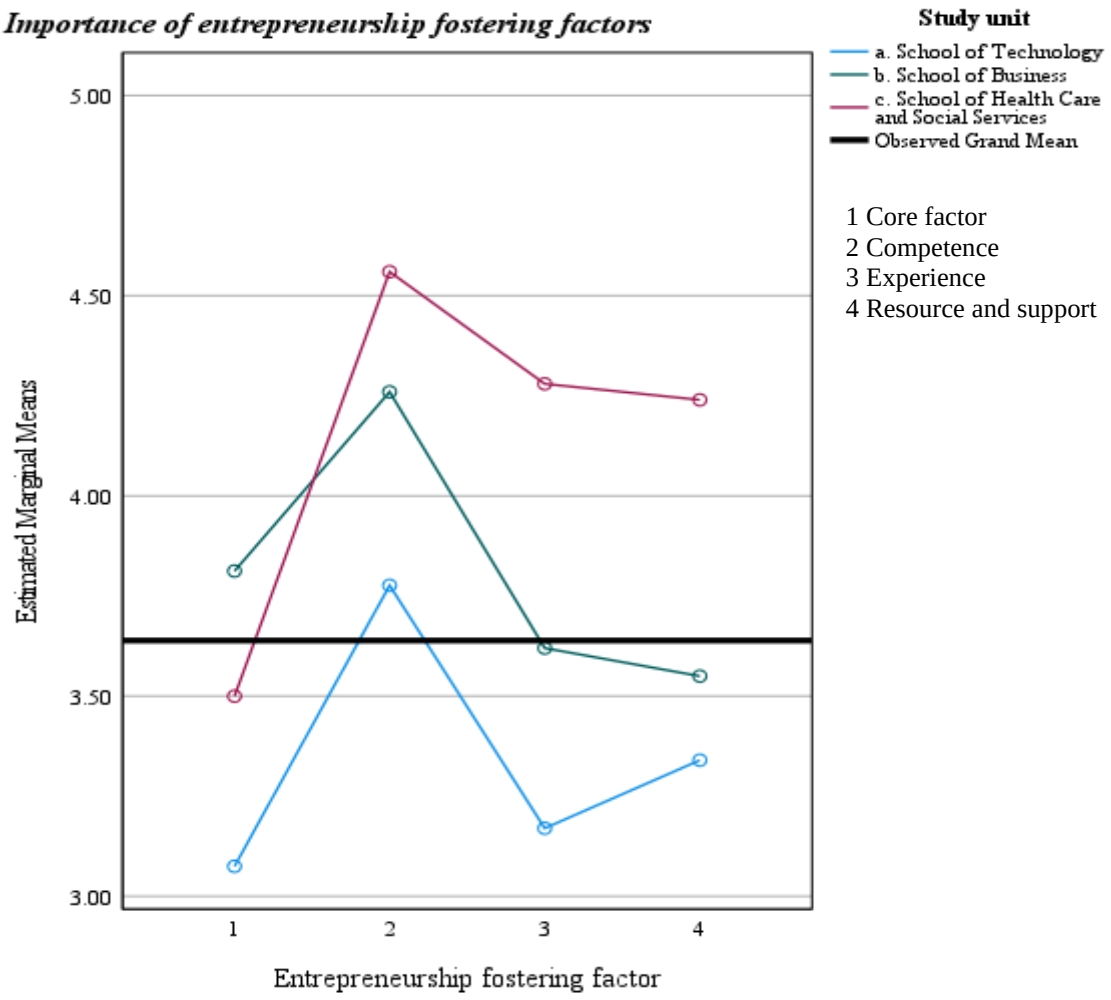

Figure 16. Means of the 4 extracted factors by study unit.

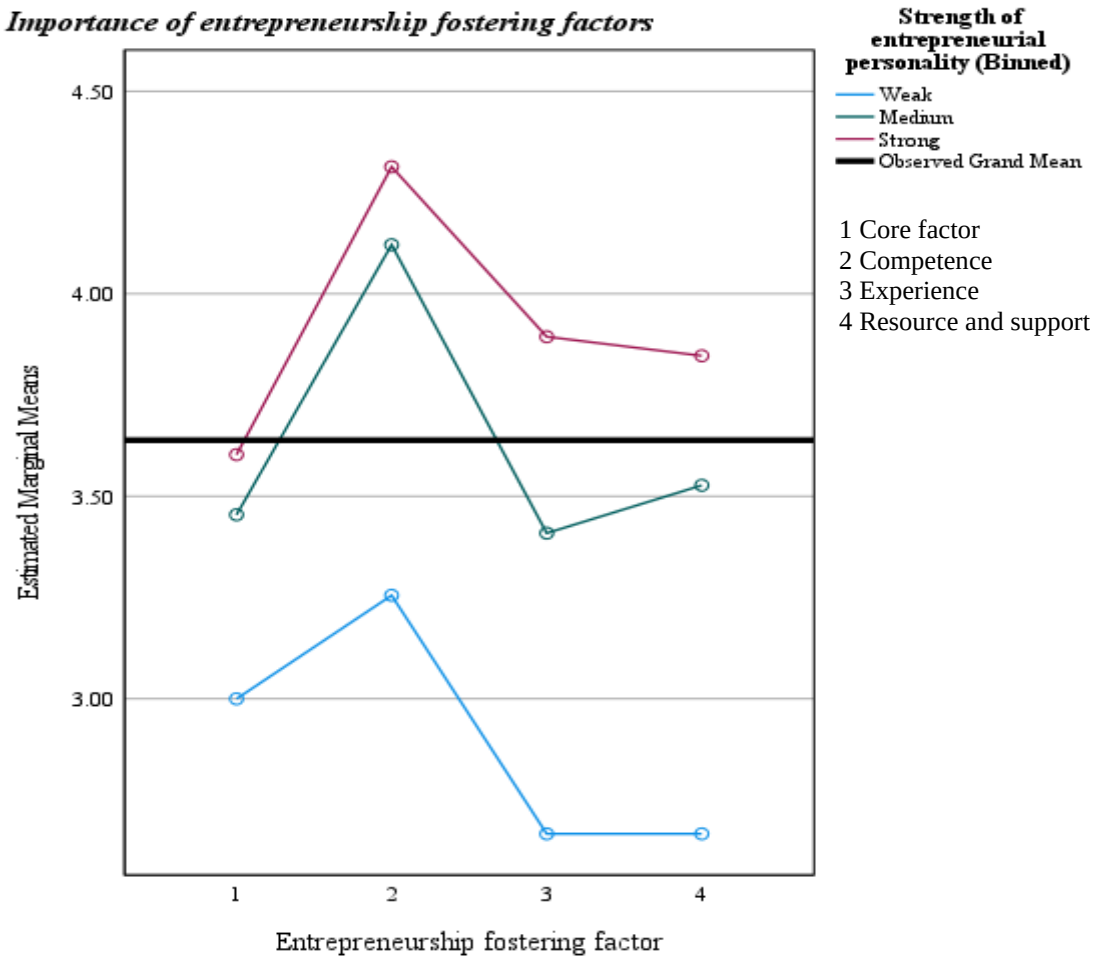

Figure 17. Means of the 4 extracted factors by strength of entrepreneurial personality

5.3 Evaluation of VAMK's Situation from Students' Perspectives

Table 28 presents the descriptive statistics of the evaluations on how VAMK has been fostering entrepreneurship from students' perspectives. Majority of the evaluations are graded in the middle range (around 3, as "neutral or I don't know") except variable Evaluation_RS with a value of 2.6 (between "somehow disagree" and "neutral or I don't know") and the smallest standardized deviation of 0.915, which makes it seem that the samples tend to have a similar opinion regarding this item. In general, it implies that VAMK would need to put more effort improve entrepreneurship promotion. But it is always wise and recommended to work towards the expectation, that is why the "need" and the "evaluation" of entrepreneurship fostering factors were compared, even though the two sets of variables were not on the same measurement (importance for the "need" vs degree of agreement for the "evaluation"). The result of the comparison is shown in Table 29.

Based on the result, there are non-significant differences between the need and the evaluation for attitude and self-efficacy, but the differences between the need and the evaluation for perception, motivation, competence, experience, and resource/support are statistically significant. The mean differences are also shown in the result with a large effect size located on motivation, competence, and resource/support (partial etas squared are all greater than 0.138). Resource/support is having the largest effect size ($\eta^2 = 0.474$) of all, confirming the findings from the descriptive statistics mentioned above, also indicating one of the big gaps where the improvement should focus in VAMK.

However, it must be acknowledged that it was a limitation in the survey design that the value "3" was instructed as "neutral or I don't know" for the items on evaluation, which somehow leads to inappropriate data quality. So the validity of this result could have been improved.

Furthermore, regarding the evaluation, the respondents were asked whether VAMK has been fostering entrepreneurship among students in any other way and how. The opinions are summarized below:

- The teachers have raised the students' interest toward entrepreneurship and share their own experience in class.

- Teambuilding enables practical business knowledge sharing.
- VAMK has provided different kinds of training and opportunities, but only a small portion of students are guided to become entrepreneurs, most are geared towards the work life in the big companies.

Table 28. Descriptive statistics of the evaluations on how VAMK has been fostering entrepreneurship from students' perspectives

	Mean	N	Std. Deviation
Evaluation_perception	2.91	45	1.221
Evaluation_attitude	3.09	45	1.258
Evaluation_motivation	3.00	45	1.314
Evaluation_selfefficacy	2.93	45	1.195
Evaluation_Culture1	2.96	45	1.167
Evaluation_Culture2	2.96	45	1.043
Evaluation_competence	3.18	45	1.072
Evaluation_experience	3.16	45	1.043
Evaluation_RS	2.60	45	0.915
Evaluation_network	3.02	45	1.011
Evaluation_RDI	2.84	45	0.976

Table 29. ANOVA results of comparing the "need" and the "evaluation" of entrepreneurship fostering factors

Tests of Within-Subjects Effects
Compare the 'need' and the 'evaluation' of entrepreneurship fostering factors

Factors	df 1	df 2	Mean Difference ('Need'-'Evaluation')	F	Sig.	Partial Eta Squared
Perception	1	44	0,556*	5,814	0,020	0,117
Attitude	1	44	0,289	2,196	0,145	0,048
Motivation	1	44	0,756*	16,547	0,000	0,273
Self efficacy	1	44	0,267	1,455	0,234	0,032
Competence	1	44	0,901*	28,444	0,000	0,393
Experience	1	44	0,338*	4,739	0,035	0,097
Resource & support	1	44	0,933*	39,632	0,000	0,474

*. The mean difference is significant at the ,05 level.

5.4 Improvement for Entrepreneurship-Fostering Practice in VAMK

Based on the analysis result and discussion above, in order to improve the practice of fostering entrepreneurship in VAMK, the focus should include enhancement of students' perception, motivation, competence, and experience regarding entrepreneurship, as well as provision of resource and support. Motivation, competence and resource/support are the most critical areas VAMK should work on because of the big gap between students' expectation and the reality.

In addition, there were two open questions in the survey asking about improvement regarding fostering entrepreneurship in VAMK. The first question was how VAMK can do better, or what else VAMK should do, to foster entrepreneurship among students. The qualitative answers are summarized below:

University capacity optimization related:

VAMK needs good teachers with successful entrepreneurial experience who have valuable things to add to the course themselves. All students with interest in becoming an entrepreneur should be identified and gathered together for courses recommendation and more other activities. In addition, there should be better-designed entrepreneurship courses and more selections on different topics on entrepreneurship with different levels. It is important to have a beginner course that includes the very basics on how to start a business as an induction of entrepreneurship to all students. Providing too many negative (challenging) aspects of entrepreneurship at the start of courses can drive away the small amount of interested students, hence positive aspects of entrepreneurship should be the focus in the beginning. On the other hand, entrepreneurship and inspiration for innovative ideas in social field should become a course topic too.

Activities and events related:

VAMK should arrange more seminars, info events and workshops about entrepreneurship, with good marketing to the students. For example, inviting guests (alumni preferred) to share their experience/journey/passion of entrepreneurship.

Resource/support related:

- Practical Knowledge – VAMK should provide more practical knowledge about entrepreneurship, especially about how to establish a business in Finland in terms of jurisprudence, permits, taxation, government aid and financing issues, etc. as the starting point.
- Cooperation and networking – VAMK should have more cooperation with enterprises and provide more networking sessions with entrepreneurs
- Incubation – It would be good to provide different sorts of incubators to intending students.

The second question asked what could be the biggest barrier/restriction, when students are deciding to choose entrepreneurship as a career option or preparing to be an entrepreneur. This question tried to explore the critical areas that VAMK should improve in a reverse way. After summarizing and categorizing the answers, the biggest barriers or restrictions for entrepreneurship include fear of failure or lack of courage especially regarding financial risk, and commitment, which is personality related; negative influence from other entrepreneurs' experience; perception, motivation and self-efficacy, which belong to mental and psychological related core factors; business idea, vision and innovation; competence and experience; network, legal and financial resource.

In all, the qualitative answers are corresponding to the quantitative analysis result on the improvement. University capacity-optimization-related improvements can lead to enhancement of students' perception, motivation and competence in entrepreneurship, while activities and events-related improvement can lead to enhancement of students' experience, and resource/support-related improvements provide a suitable environment for students' initial entrepreneurial activities. Although personality-related barriers or restrictions can be difficult for the university to tackle, all other mentioned barriers or restrictions are proved to be the areas for improvement in VAMK and are in line with the framework of the model in this research.

6 CONCLUSION

This section provides a summary of the whole research process as well as discusses the reliability and validity of this thesis. Moreover, it concludes the practical implications from the research results, which could be applied in reality for VAMK to improve its practice of fostering entrepreneurship on campus.

6.1 Overview, Reliability and Validity

This thesis contributes to the research of fostering entrepreneurship in universities by extending the range and the depth of the previous studies of VAMK. Using VAMK as the case, a model is developed for universities to create and improve their practice of fostering entrepreneurship among students. In the model, four factors that are important for students' potential entrepreneurial behaviors are consolidated, the impact of students' profiles on these four factors is considered, and the measures from the eight areas that construct an entrepreneurship-fostering environment in the university are summarized. During the research design, this thesis has attempted to develop a way to measure some latent variables including the strength of students' entrepreneurial personality and the importance of the four entrepreneurship-fostering factors. During the data analysis, this thesis has performed detailed tests and data treatments in a logical way with different statistical techniques to obtain meaningful findings and conclude solid improvement suggestions for the practice of fostering entrepreneurship in VAMK. Firstly, the profiles of students in VAMK were examined, the associations between different profile elements were tested, and students' orientations towards entrepreneurship were mapped. Secondly, entrepreneurship-fostering factors were analyzed, confirmed and compared, additionally, the effect of elements from students' profile on the factors were tested. Thirdly, gaps for improvement were identified by comparing students' needs and the evaluation of the reality regarding how entrepreneurship has been fostered at the moment in VAMK, and the model for fostering entrepreneurship was customized and improvement was also suggested for VAMK based on the findings. In the end, this thesis has provided useful recommendations for further research. To summarize, this thesis has fulfilled its aim.

Regarding the reliability and validity, this study has some limitations. Small sample size is one of the biggest limitations, which might lead to weaker reliability and validity. For

example, as seen from data analysis, the association patterns between variables from students' profiles were not too obvious and hence it was relatively challenging to have a clear and reliable interpretation of the results; and not all pre-assumptions for the tests were met and some of the test results contradicted with each other, which cause a negative impact on the validity. The voluntary sampling method used in this thesis might have brought some bias to the results, since the structure of this sample is not representing the structure of the population. In survey design, the measurement scale for the evaluation of how VAMK has been performing entrepreneurship promotion should have excluded the statement of "I don't know" for score 3, as this has led to inconsistency in data values and less satisfying data quality, hence less validity in the result of data analysis that involved the variables for evaluation. But on the other hand, this thesis has been based on solid literature reviews as the theoretical framework; the process for developing and confirming the model and the data analysis techniques are appropriate; and the interpretation of the result tried to be as objective as possible. So in terms of methodology, this research has maintained relatively good validity.

6.2 Practical Implication - Students' Profile and Their Orientation to Entrepreneurship

This research observed that students' entrepreneurial intention seems to have an association with their entrepreneurial experience, self-efficacy, learning intention, the strength of their entrepreneurial personality and the influence of role model in an active way. In addition, students' learning intention also seems to have an association with their entrepreneurial experience. The strength of students' entrepreneurial personality, on other hand, seems to have an association with entrepreneurial culture in their growth environment and the influence of role model in an active way. This implies that, first of all, by offering chances and encouraging students to get more positive entrepreneurial experience, VAMK could drive their learning intention towards real entrepreneurial practice and hence enhance their entrepreneurial intention; second, helping students to establish the needed self-efficacy, commonly via entrepreneurship education focusing on building entrepreneurial competence, could level up their entrepreneurial intention; third, providing influence of entrepreneurial role models and creating a positive culture on entrepreneurship in VAMK might induce or even strengthen the entrepreneurial personality among students, from which potentially increase the amount of students that have entrepreneurial intention.

Since the profiles of students in VAMK were mapped out in this research, it is understood that majority of them does not seem to have entrepreneurial experience at all, and a small portion of them does not have access to entrepreneurship courses in VAMK; a bit less than half of them would like to learn about entrepreneurship for interest or knowledge/skill and only less than 10% of them would like to learn entrepreneurship for real entrepreneurial practice; the entrepreneurial intention from more than half of the students seems to be uncertain as they are not sure whether entrepreneurship could be their career option, and around 20% of the students would like to be an entrepreneur at some point with about half of them planning to realize the entrepreneurial practice within 3 years after graduation and the other half would need longer time to prepare. Furthermore, in general, it seems that majority of the students in VAMK tend to have medium entrepreneurial personality, but elements such as risk-taking propensity, creativity and alertness appear to be weaker among them. All these mean that the base for fostering entrepreneurship in VAMK is relatively low, especially in terms of students' entrepreneurial intention, and there are areas that would require substantial effort to improve, for example, how to support and encourage students to obtain more entrepreneurial experience, how to develop their risk management skill, how to enhance students' creativity, and how to inspire them to discover, develop and utilize business opportunities. Since majority of the students are somehow in the "middle ground", it is both a chance and a challenge to induce and guide them towards entrepreneurship, if entrepreneurship were to be fostered successfully in VAMK.

Regarding the students' orientation towards entrepreneurship, firstly, it seems that a bit more than half of them possess a neutral attitude to entrepreneurship before they study in VAMK, meaning that these students could be influenced to adopt a more positive attitude towards entrepreneurship by creating a suitable environment in VAMK, and they could potentially become interested or assured in choosing entrepreneurship as their career option (Römer-Paakkanen 2006). Secondly, freedom, instead of the need for achievement (McClelland 1961, 233-237), seems to be the most common motivation for entrepreneurship among the students. This has been also one of the motivations for entrepreneurship in the other previous study (Brink 2008), but further research is needed in order to understand what "freedom" is referring to in particular, so that VAMK could foster entrepreneurship by adopting different perspectives from relevant motivations. Thirdly, most of

the students are able to understand entrepreneurship in terms of its content and practice, however, around 30% of them do not seem to percept entrepreneurship as an important way to meet some important societal demands and contribute to economic development and growth, which is particularly fundamental for widening the scope and sense of entrepreneurship and the development of innovative and meaningful business ideas (Wennekers et al. 1999; Carree et al. 2005; Wong et al. 2005; Caloghirou et al. 2015; Van Praag et al. 2007; Edwards 2011). Finally, students' self-efficacy for entrepreneurship seems to be relatively weak currently and only around 20% of them are either strongly confident or relatively confident in their competence for successful entrepreneurship. As mentioned above, since self-efficacy is associated with entrepreneurial intention, the study time in VAMK should be utilized as a period during which students are encouraged and provided opportunities to build up adequate confidence by obtaining the needed entrepreneurial competence and experiencing trial activities on entrepreneurship (Wilson et al. 2009).

6.3 Practical Implication - Entrepreneurship-fostering Factors on Campus

This research confirmed both the content and structure of the four entrepreneurship fostering factors in the model. The first factor is the core mental and psychological factor, the second factor is entrepreneurial competence, the third factor is entrepreneurial experience and the fourth factor is resource and support provided by VAMK. These four factors, especially entrepreneurial competence, are important and needed for students to perform entrepreneurial tasks. Some elements in each factor were removed or reassigned during data analysis. An internal comparison of the importance of all elements was conducted for each factor. For core mental and psychological factor, motivation for entrepreneurship is the most important element while self-efficacy is the least important element. For the factor of entrepreneurial competence, the most important elements are decision making, problem-solving, and adeptness/flexibility, while the least important elements are cognition/analysis, resource utilization/configuration, and new product/service prototyping/development. For the factor of entrepreneurial experience, the most important element is co-operation with local businesses regarding real-life project work or guest lecturing, while the least important element is teambuilding. For the factor of resource and support, the more important elements are practical information that is highly relevant for starting a business and legal/business consultancy, while facility, referral/networking, and

initial funds are less important. This provides VAMK with useful information on what its effort for fostering entrepreneurship should focus more on for each factor. But since the average importance of all elements for each factor is above the neutral score of 3, the least important elements are relative and they should not be ignored at all.

Differences in the importance of the four factors are also observed. First of all, male and female students consider the importance of the four factors for initiating their entrepreneurial behavior in a different way. While in general entrepreneurial competence is observed to be the most important factor, for male students, it is considered to share similar importance with core mental and psychological factor and resource/support, and only experience is considered to be less important compared to competence. Female students, on the other hand, consider competence much more important than any other three factors, which share similar importance. This implies that regarding building entrepreneurial competence, female students might need more support. Secondly, the factor of entrepreneurial experience seems to be much more important to the students from the school of health care and social services, meaning that opportunities to obtain entrepreneurial experience should also be provided to these students so that they could be prepared or induced for potential entrepreneurial behavior in the social field or other areas. Thirdly, the factors of entrepreneurial competence, experience and resource/support seem to be much more important to the students with strong entrepreneurial personality than to those with weak entrepreneurial personality. As students with strong entrepreneurial personality also have stronger entrepreneurial intention, they are more serious about building their entrepreneurial competence and experience, and they also value and require resource and support when it comes to the point where they could start their own businesses for real. For VAMK, it means it would be an effective and resource-optimized practice to identify the entrepreneurship-intending students and offer them special educational programs including different kinds of projects or practices, as well as resource and support on need base.

6.4 Practical Implication - Evaluation, Gaps and Improvement

There is a perception from certain students that only a small portion of students are guided to become entrepreneurs in VAMK. This, however, cannot be confirmed in this research but is worth of further study on VAMK's policy and strategy on the target groups of

entrepreneurship promotion. In general, VAMK's performance in fostering entrepreneurship seems to be on a middle level, which means that VAMK would need to improve all areas regarding fostering entrepreneurship. In detail, its impact on the students' attitude and self-efficacy towards entrepreneurship are meeting the students' expectations, but significant gaps for improvement have been identified in regards to students' perception of entrepreneurship, their motivation for entrepreneurship, entrepreneurial competence and experience, as well as resource/support provided in VAMK, as all these mentioned areas are below the students' expectation. In particular, resource/support turns out to be the area that has the biggest gap between reality and expectation, and hence, one of the most critical areas for improvement.

Finally, based on quantitative data analysis and qualitative opinions from students, this research has obtained practical improvement suggestions for some areas that contribute to a more effective entrepreneurship-fostering environment in VAMK. First, courses should be better designed in content, with more selections in terms of levels, topics and availabilities, for example, having basic courses to raise students' interest and advanced courses available for a deeper and wider understanding of entrepreneurship, including entrepreneurship topics in the social field, and promoting accesses to entrepreneurship courses to all students in VAMK. Second, entrepreneurship education resources and methodology need to be improved in terms of the qualification of the teachers and guest lecturers/speakers, and the teaching/learning experience and quality. The focus should be placed on building entrepreneurial competence and experience via different kinds of programs, activities, events and co-operation projects in addition to normal classes, and targeting and mixing entrepreneurship-intending students effectively. Third, establish a positive culture and role model on entrepreneurship to raise students' passion and increase their engagement towards entrepreneurship, help them to find own motivations for entrepreneurship, encourage and inspire their entrepreneurial behavior. Fourth, essential resource and support should be provided as a solid stepping stone to initial entrepreneurial activities, for example, offering highly relevant and practical information on entrepreneurship, networking opportunities, as well as legal, finance and business consultancy. Last but not least, constantly identify students' unique needs and offer customization. For example, based on this research, female students might tend to put more effort to build up their entrepreneurial competence and hence might need extra support; students from

school of health care and social services might tend to collect more entrepreneurial experience before they could start a business and hence it is critical not to leave them out whenever there are opportunities for entrepreneurial activities or projects; students with strong entrepreneurial personality might set much higher expectation on their learning outcomes and the available resource/support and hence special programs and more organizational capacity might need to be allocated to them. Based on this research, the customized model with detailed elements for VAMK is presented in Figure 18.

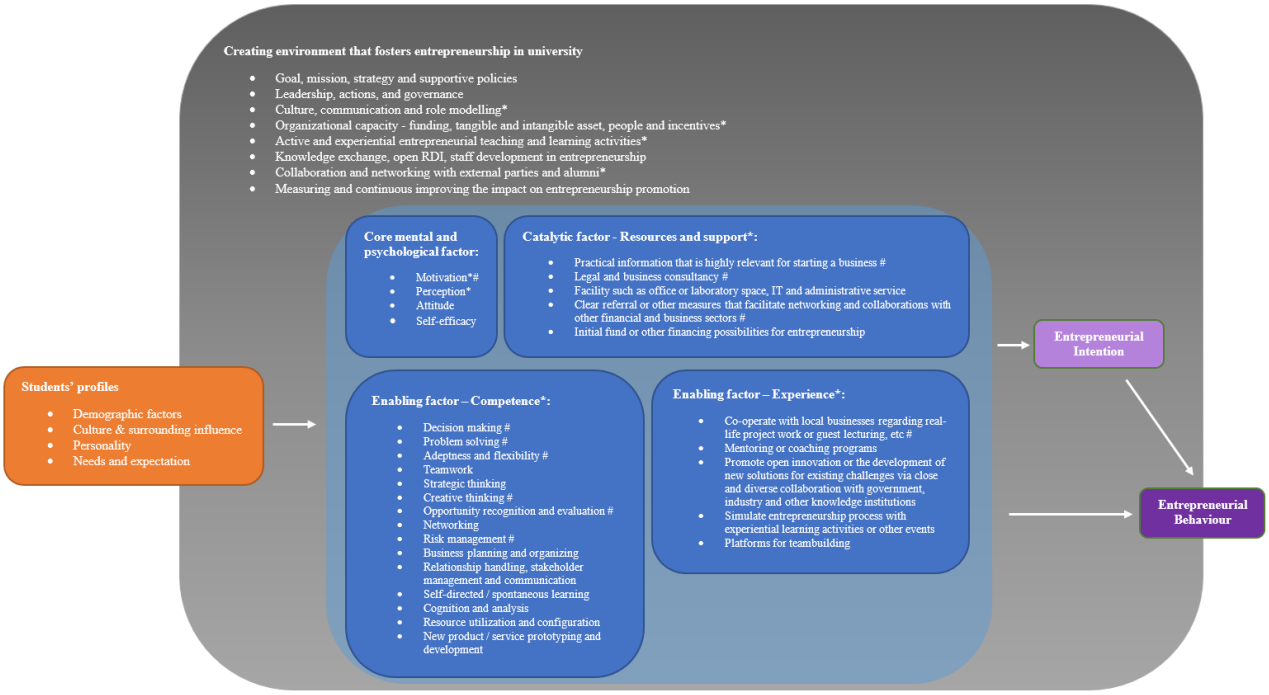

Figure 18. Customized model on fostering entrepreneurship with detailed elements listed for VAMK. Elements with * are the areas that need improvement and elements with # are the focus areas that require more effort to develop.

7 FURTHER RESEARCH RECOMMENDATIONS

This thesis was a case study of VAMK and hence the results were only applicable to VAMK with a limited valid time frame, but the methodology could be reused on VAMK and other AMKs in future research for follow-ups or exploration regarding fostering entrepreneurship on campus. To achieve more reliable and valid results in future research, a larger sample size that is well representing the population structure together with a corrected measurement scale is critical. When the students' profiles would evolve and so as their effect on the needs of the factors, it is worth of a longitude study on the same AMK to evaluate the effect of the improvement measures or the practices of fostering entrepreneurship, as well as to follow any changes on the factors or the gap for improvement, so that the practices can be adjusted and remain effective based on the up-to-date status. If further research with the same methodology would be performed on different AMKs, the results could be compared to identify any subject-specific or common mechanism of the model. A similar aim can be achieved also when the result from one AMK could be tested on other AMKs. However, many universities do face certain dilemmas even though there would have been a suitable working model and good practices for fostering entrepreneurship in place. For example, universities need to balance the reduction of budgets, quality demands, the scope of service, and the development of own synergistic potential (Shattock 2009; Gibb 2012). How to tackle these dilemmas to ensure the model and good practices can be realized in universities would be a topic for further research. Then, regarding the improvements in fostering entrepreneurship on campus, future research could focus on finding the best practices from more AMKs and theorizing them. Furthermore, valuable directions for further researches include 1) a better understanding "freedom" as the entrepreneurial motivation and why, 2) the reasons why the importance of the four factors are different in general as well as between different subgroups divided by gender, study unit and entrepreneurial personality, 3) the reasons why the importance of the elements within each factor are different. Last but not least, this thesis was based only on students' perspectives, faculty and other stakeholders could be interviewed in further research to obtain more complete findings on this topic.

REFERENCES

Ajzen, I. and Fishbein, M., 1980. Understanding Attitudes and Predicting Social Behavior. Englewood Cliffs, NJ. Prentice-Hall.

Ajzen, I., 1991. The theory of planned behavior. Organizational behavior and human decision processes, 50(2), pp.179-211.

Ardichvili, A., Cardozo, R. and Ray, S., 2003. A theory of opportunity identification and development. Journal of Business Venturing, 18. pp. 105-23.

ARENE ry 2006. Yrittäjyysstrategia. Accessed 12.1.2009. http://www.arene.fi/data/dokumentit/20070911T150636_06098.pdf

Autio, E., Keeley, R.H., Klofsten, M., GC Parker, G. and Hay, M., 2001. Entrepreneurial intent among students in Scandinavia and in the USA. Journal of Enterprise and Innovation Management Studies, 2(2), pp.145-160.

Babbie, E.R., 2010. The practice of social research, 12th ed. Belmont, CA. Wadsworth Cengage.

Bandura, A., 1977. Self-efficacy: toward a unifying theory of behavioral change. Psychological review, 84(2). pp. 191-215.

Baron, R.A., 2000. Counterfactual thinking and venture formation: the potential effects of thinking what might have been. Journal of Business Venturing, 12. pp. 275-94.

Barron, F. and Harrington, D.M., 1981. Creativity, intelligence, and personality. Annual review of psychology, 32(1), pp.439-476.

Baumol, W.J. and Strom, R.J., 2007. Entrepreneurship and economic growth. Strategic entrepreneurship journal, 1(3-4), pp.233-237.

Birch, D.G., 1987. Job creation in America: How our smallest companies put the most people to work. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.

Bird, B., 1988. Implementing entrepreneurial ideas: The case for intention. Academy of management Review, 13(3), pp.442-453.

Blenker, P., Dreisler, P., Færgemann, H.M. and Kjeldsen, J., 2004. Entrepreneurship education and university context. In 14th IntEnt Conference in Naples.

Boh, W.F., De-Haan, U. and Strom, R., 2016. University technology transfer through entrepreneurship: faculty and students in spinoffs. The Journal of Technology Transfer, 41(4), pp.661-669.

Boyd, N.G. and Vozikis, G.S., 1994. The influence of self-efficacy on the development of entrepreneurial intentions and actions. Entrepreneurship theory and practice, 18(4), pp.63-77.

Brink, A., 2008. Yrittäjyyden edistäminen Vaasan ammattikorkeakoulun liiketalouden yksikön yrittäjyyskasvatusjuonteessa sekä juonteen pedagoginen strategia ja teema. In Yrittäjyyden edistäminen korkeakoulujen tehtävänä, pp. 153-161. Luoto, S., Melin, K. & Ristimäki, K. (Eds). Vaasan ammattikorkeakoulu, University of Applied Sciences. Oy Fram Ab.

Brockhaus Sr, R.H., 1980. Risk taking propensity of entrepreneurs. Academy of management Journal, 23(3), pp.509-520.

Caiazza, R. and Ferrara, G., 2016. Economic geography and multipolar strategies: an empirical analysis. Journal of Management Development, 35(3). pp. 394-405. https://doi.org/10.1108/JMD-08-2014-0090

Caloghirou, Y. and Protogerou, A., 2015. The AEGIS survey: a quantitative analysis of new entrepreneurial ventures in Europe. In Dynamics of Knowledge Intensive Entrepreneurship (pp. 72-118). Routledge.

Cantillon, R., 1755. 'The circulation and exchange of goods and merchandise'. In Essai sur la Nature du Commerce en Général (pp. 51). H. Higgs. London. Macmillan. 1931.

Carayannis, E.G., 2014. New business creation, entrepreneurial will and need of achievement. In Student entrepreneurship in the social knowledge economy, pp. 23–40. Springer International Publishing. https://doi.org/10.1007/978-3-319-05567-1_3

Carree, M.A. and Thurik, A.R., 2005. Understanding the role of entrepreneurship for economic growth (No. 1005). Papers on Entrepreneurship, Growth and Public Policy.

Casson, M., 1982. The Entrepreneur. Oxford. Martin Robertson and Co..

Casson, M., 1990.Enterprise and Competitiveness: A Systems View of International Business. Oxford. Clarendon Press.

Charney, A. and Libecap, G.D., 2000. Impact of entrepreneurship education. Insights: A Kauffman research series. Kauffman Center for entrepreneurial leadership, pp.1-8.

Chell, E., 2008. The Entrepreneurial Personality: A Social Construction, 2nd ed.. London and New York. Routledge.

Chell, E., 2013. Review of skill and the entrepreneurial process. International Journal of Entrepreneurial Behavior & Research.

Clark, B., 2001. The entrepreneurial university: New foundations for collegiality, autonomy, and achievement. Higher Education Management, 13(2). pp. 1-131.

Clark, B.R., 1998. Creating entrepreneurial universities: organizational pathways of transformation. New York, NJ. Pergamon Press.

Costello, A.B. and Osborne, J., 2005. Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. Practical assessment, research, and evaluation, 10(7). https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1156&context=pare

Crant, J.M., 1996. The proactive personality scale as a predictor of entrepreneurial intentions. Journal of Small Business Management, 34(3). pp. 42-49.

DiStefano, C., Zhu, M. and Mindrila, D., 2009. Understanding and using factor scores: Considerations for the applied researcher. Practical Assessment, Research, and Evaluation, 14(20). http://pareonline.net/getvn.asp?v=14&n=20

Doutriaux, J., 1987. Growth pattern of academic entrepreneurial firms. Journal of business venturing, 2(4), pp.285-297.

Down, S., 2006. Narratives of enterprise: Crafting entrepreneurial self-identity in a small firm. Cheltenham. Edward Elgar Publishing.

Dreyfus, H. L. and Dreyfus, S. E., 1986. Mind over machine: The power of human intuition and expertise in the era of the computer. New York. Free Press.

Drucker, P. F., 1985. Innovation and entrepreneurship: Practice and principles. 1st Perennial Library edition. New York. Perennial Library.

Duxbury, T., 2012. Creativity: Linking theory and practice for entrepreneurs. Technology Innovation Management Review, 2(8).

Edwards, L.J. and Muir, E.J., 2012. Evaluating enterprise education: why do it? Education + Training, 54(4). pp. 278-290. https://doi.org/10.1108/004009112112361361

Edwards, L.J., 2011. The entrepreneurial journey from university to business. Unpublished doctoral dissertation. UK. University of Glamorgan.

Erkkilä, K., 2000. Entrepreneurial education: mapping the debates in the United States, the United Kingdom and Finland. Taylor & Francis.

Etzkowitz, H. and Leydesdorff, L., 2000. The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university–industry–government relations. Research policy, 29(2), pp.109-123.

Etzkowitz, H. and Zhou, C., 2006. Triple Helix twins: innovation and sustainability. Science and public policy, 33(1), pp.77-83.

Etzkowitz, H., 2003. Research groups as 'quasi-firms': the invention of the entrepreneurial university. Research policy, 32(1), pp.109-121.

Etzkowitz, H., Webster, a, Gebhardt, C., & Terra, BRC (2000). The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm. Research policy, 29(2), pp.313-330.

European Commission 2001. Building an innovative economy in Europe. Luxembourg. European Commission.

European Commission 2007. Schools for the 21st century. Commission Staff Working Paper. No.1009. Accessed July 2007. http://ec.europa.eu/education/school21/consult-doc_en.pdf

FAO 1997 a. Marketing Research and Information Systems. Chapter 4: Questionnaire Design. Accessed 27.6.2022. https://www.fao.org/3/w3241e/w3241e05.htm

FAO 1997 b. Marketing Research and Information Systems. Chapter 1: The Role Of Marketing Research. Accessed 27.6.2022. https://www.fao.org/3/w3241e/w3241e02.htm#step%204:%20decision%20on%20data%20collection%20method

Feki, C. and Mnif, S., 2016. Entrepreneurship, technological innovation, and economic growth: Empirical analysis of panel data. Journal of the Knowledge Economy, 7(4), pp.984-999.

Ferreira, J.J., Raposo, M.L., Rodrigues, R.G., Dinis, A. and Do Paco, A., 2012. A model of entrepreneurial intention: An application of the psychological and behavioral approaches. Journal of small business and enterprise development, 19, pp.424–440.

Field, A. P., 2005. Discovering statistics using SPSS (2nd edition). London. Sage. http://www.discoveringstatistics.com/docs/factor.pdf

Field, A. P., 2013. Discovering Statistics with IBM SPSS. Newbury Park, CA. Sage.

Fini, R., Grimaldi, R., Marzocchi, G.L. and Sobrero, M., 2012. The determinants of corporate entrepreneurial intention within small and newly established firms. Entrepreneurship Theory and Practice, 36(2), pp.387-414.

Fitzsimmons, J.R. and Douglas, E.J., 2011. Interaction between feasibility and desirability in the formation of entrepreneurial intentions. Journal of business venturing, 26(4), pp.431-440.

Franke, N. and Lüthje, C., 2004. Entrepreneurial intentions of business students - A benchmarking study. International journal of innovation and technology management, 1(03), pp.269-288.

Garavan, T.N. and O'Cinneide, B., 1994. Literature review of problems associated with entrepreneurship education and training programmes. Journal of European industrial training, 18(8), pp.3-12.

Gibb, A., 2002. In pursuit of a new 'enterprise' and 'entrepreneurship' paradigm for learning: creative destruction, new values, new ways of doing things and new combinations of knowledge. International journal of management reviews, 4(3), pp.233-269.

Gibb, A., 2012. Exploring the synergistic potential in entrepreneurial university development: towards the building of a strategic framework. Annals of Innovation & Entrepreneurship, 3. pp. 1–24. http://ncee.org.uk/wp-content/uploads/2014/06/From-Concept-To-Action.pdf

Gilad, B.S., 1982. On Encouraging Entrepreneurship: An Interdisciplinary Approach. Journal of Behavioral Economics. 11(1), pp. 132-63.

Gilad, B.S., 1986. Entrepreneurial Decision Making: Some Behavioral Considerations. In Handbook of Behavioral Economics, Volume A, Behavioral Microeconomics. Gilad, B.S. & Kaish, S. (Eds). Greenwich, CT. JAI Press.

Gilbert, D.H., 2012. From chalk and talk to walking the walk: Facilitating dynamic learning contexts for entrepreneurship students in fast-tracking innovations. Education+ Training, 54(2/3). pp. 152-166. https://doi.org/10.1108/00400911211210260

Gorman, G., Hanlon, D. and King, W., 1997. Some research perspectives on entrepreneurship education, enterprise education and education for small business management: a ten-year literature review. International small business journal, 15(3), pp.56-77.

Guerrero, M. and Urbano, D., 2012. The development of an entrepreneurial university. The Journal of Technology Transfer, 37(1), pp.43-74.

Guerrero-Cano, M., Urbano, D. and Kirby, D., 2006. A literature review on entrepreneurial universities: An institutional approach. Universitat Autònoma de Barcelona. Departament d'Economia de l'Empresa. Accessed 3.2.2022. Https://ddd.uab.cat/record/212739

Hagen, E.E., 1962. On the Theory of Social Change: How Economic Growth Begins. Homewood, IL. Dorsey Press.

Hair, J.J.F., Black, W.C., Babin, B.J. and Anderson, R.E., 2009. Multivariate Data Analysis: A Global Perspective (7th ed.). Upper Saddle River. Prentice Hall.

Hamilton, R.T. and Harper, D.A., 1994. The entrepreneur in theory and practice. Journal of economic Studies. 21(6), pp.3-18. https://doi.org/10.1108/01443589410071391

Hannon, D. P., 2013. Why is the Entrepreneurial University Important? Journal of Innovation Management, 1(2). pp. 10-17.

Harte, V. and Stewart, J., 2012. Develop. evaluate. embed. sustain: enterprise education for keeps. Education + Training, 54(4). pp. 330-339. https://doi.org/10.1108/00400911211236190

HEInnovate 2022. HEInnovate general presentation. Accessed 18.1.2022. https://www.heinnovate.eu/sites/default/files/2021-11/HEInnovate%20general%20presentation.pdf

Heinonen, J. and Poikkijoki, S.A., 2006. An entrepreneurial-directed approach to entrepreneurship education: mission impossible?. Journal of Management Development, 25(1). pp. 80-94. https://doi.org/10.1108/02621710610637981

Hidayat, N.K. and Andri, A., 2017. Crafting the Effective Learning Model for High Education: An Investigation from the business Incubator in Three Universities in Indonesia. Journal of Management and Strategy, 8(5), pp.18-29.

Hofer, A. and Potter, J., 2010. Universities, Innovation and Entrepreneurship: Criteria and Examples of Good Practice. OECD Local Economic and Employment Development (LEED) Papers, No. 2010/10. Paris. OECD Publishing. https://doi.org/10.1787/5km7rq0pq00q-en

Hofer, A.R., Potter, J., Redford, D. and Stolt, J., 2013. Promoting successful graduate entrepreneurship at the technical university ilmenau, Germany. OECD Local Economic and Employment Development (LEED) Working Papers. 2013/03. OECD Publishing. http://dx.doi.org/10.1787/5k4877203bjh-en

Howell, D.C., 2002. Statistical Methods for Psychology (5th ed.). Pacific Grove, CA. Duxbury.

Hytti, U., Stenholm, P., Heinonen, J. and Seikkula-Leino, J., 2010. Perceived learning outcomes in entrepreneurship education: The impact of student motivation and team behaviour. Education+ Training, 52(8/9). pp. 587-606. https://doi.org/10.1108/00400911011088935

Isenberg, D., 2011. The entrepreneurship ecosystem strategy as a new paradigm for economic policy: Principles for cultivating entrepreneurship. Presentation at the Institute of International and European Affairs, 1(781), pp.1-13.

Jacob, M., Lundqvist, M. and Hellsmark, H., 2003. Entrepreneurial transformations in the Swedish University system: the case of Chalmers University of Technology. Research policy, 32(9), pp.1555-1568.

Johnson, D., Craig, J.B. and Hildebrand, R., 2006. Entrepreneurship education: towards a discipline-based framework. Journal of Management development.

Jylli, J., 2009. Yrittäjyyden edistäminen Vaasan ammattikorkeakoulun liiketalouden koulutusohjelmassa. Vaasan ammattikorkeakoulu, University of Applied Sciences. https://www.theseus.fi/bitstream/handle/10024/122531/978-952-5784-05-3.pdf?sequence=1

Kaish, S. and Gilad, B., 1991. Characteristics of opportunities search of entrepreneurs versus executives – sources, interests, general alertness. Journal of Business Venturing, 6. pp. 45-61.

Kassean, H., Vanevenhoven, J., Liguori, E. and Winkel, D.E., 2015. Entrepreneurship education: a need for reflection, real-world experience and action. International Journal of Entrepreneurial Behavior & Research, 21(5). pp. 690-708. https://doi.org/10.1108/IJEBR-07-2014-0123

Kasturiratne, D., Lean, J. and Phippen, A., 2012. International enterprise education in Sri Lanka: a blended approach. Education+ Training, 54(4). pp. 306-318. https://doi.org/10.1108/00400911211236172

Kaufmann, P.J., Welsh, D.H. and Bushmarin, N.V., 1995. Locus of control and entrepreneurship in the Russian Republic. Entrepreneurship theory and practice, 20(1), pp.43-56.

Kim, J.O. and Mueller, C.W., 1978. Factor analysis: Statistical methods and practical issues (Vol. 14). Sage.

Kirby, D.A., 2006. Creating entrepreneurial universities in the UK: Applying entrepreneurship theory to practice. The Journal of Technology Transfer, 31(5), pp.599-603.

Kirzner, I. M., 1973. Competition and Entrepreneurship. Chicago. University of Chicago Press.

Knight, F.H., 1921. Risk, Uncertainty and Profit. New York. Hart Schaffner and Marx.

Krueger Jr, N.F. and Brazeal, D.V., 1994. Entrepreneurial potential and potential entrepreneurs. Entrepreneurship theory and practice, 18(3), pp.91-104.

Krueger Jr, N.F., Reilly, M.D. and Carsrud, A.L., 2000. Competing models of entrepreneurial intentions. Journal of business venturing, 15(5-6), pp.411-432.

Krueger, N.F. and Carsrud, A.L., 1993. Entrepreneurial intentions: Applying the theory of planned behaviour. Entrepreneurship & regional development, 5(4), pp.315-330.

Kuada, J., 2012. Research methodology: A project guide for university students. Samfundslitteratur Press.

Kuratko, D.F., 2005. The emergence of entrepreneurship education: Development, trends, and challenges. Entrepreneurship theory and practice, 29(5), pp.577-597.

Kőnig, L.S., 2013. Increasing Competitiveness Of Universities by Developing Students' Entrepreneurial Behavior. In Challenges of Europe: International Conference Proceedings (pp. 209-222). Sveuciliste u Splitu.

Liñán, F. and Chen, Y.W., 2009. Development and cross–cultural application of a specific instrument to measure entrepreneurial intentions. Entrepreneurship theory and practice, 33(3), pp.593-617.

Long, W., 1983. The meaning of entrepreneurship. American Journal of small business, 8(2), pp.47-59.

Lüthje, C. and Franke, N., 2003. The 'making'of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT. R&D Management, 33(2), pp.135-147.

Markman, G.D., 2007. Entrepreneurs' competencies. In The psychology of entrepreneurship (pp. 67-92). Robert, B., Michael, F. and Robert, B. (Eds). Mahwah, NJ and London. Robert Erlbaum.

Markuerkiaga, L., Caiazza, R., Igartua, J.I. and Errasti, N., 2016. Factors fostering students' spin-off firm formation: An empirical comparative study of universities from North and South Europe. Journal of Management Development, 35(6). pp. 814-846. https://doi.org/10.1108/JMD-03-2016-0034

Marshall, E. and Boggis, E., 2016. The statistics tutor's quick guide to commonly used statistical tests. Statstutor Community Project. University of Sheffield. https://www.statstutor.ac.uk/resources/uploaded/tutorsquickguidetostatistics.pdf

Martinelli, A., Meyer, M. and Von Tunzelmann, N., 2008. Becoming an entrepreneurial university? A case study of knowledge exchange relationships and faculty attitudes in a medium-sized, research-oriented university. The Journal of Technology Transfer, 33(3). pp.259-283.

Mazzarol, T., Volery, T., Doss, N. and Thein, V., 1999. Factors influencing small business start-ups: a comparison with previous research. International Journal of Entrepreneurial Behavior & Research.

McClelland, D.C. and Winter, D.G., 1969. Motivating economic achievement. New York, NY. The Free Press.

McClelland, D.C., 1961. The Achieving Society. D. Van Nostrand Co.. NJ. Princeton.

McClelland, D.C., 1987. Characteristics of successful entrepreneurs. The journal of creative behavior. 21 (3). pp. 219-33.

Miller, D.J. and Acs, Z.J., 2017. The campus as entrepreneurial ecosystem: the University of Chicago. Small Business Economics, 49(1), pp.75-95.

Miller, K., Alexander, A.T., Cunningham, J. and Albats, E., 2018. Entrepreneurial academics and academic entrepreneurs: A systematic literature review. International Journal of Technology Management, 77(1-3). pp. 9–37.

Miron, D. and McClelland, D.C., 1979. The impact of achievement motivation training on small businesses. California management review, 21(4), pp.13-28.

Mishra, C.S. and Zachary, R.K., 2014. The Theory of Entrepreneurship. New York. Palgrave Macmillan.

Muijs, D., 2010. Doing Quantitative Research in Education with SPSS. 2nd edition. London. SAGE Publications.

Mumford, M.D., Hester, K.S. and Robledo, I.C., 2012. Creativity in organizations: Importance and approaches. In Handbook of organizational creativity (pp. 3-16). Academic Press.

Oldham, G.R. and Cummings, A., 1996. Employee creativity: Personal and contextual factors at work. Academy of management journal, 39(3), pp.607-634.

Osborne, J.W., 2015. What is rotating in exploratory factor analysis?. Practical Assessment, Research, and Evaluation, 20(2). http://pareonline.net/getvn.asp?v=20&n=2

Paajanen, P.,2006. Ammattikorkeakoulun liiketalouden ja hallinnon alan opettajat yrittäjyyskasvattajina. In Tulevaisuuden yrittäjä: Tutkittuja näkökulmia kasvuun ja menestykseen. pp.14-32. Halttunen, J., Toivola, T., Tuomi, L. & Varamäki, E. (Eds.) Helsingin liiketalouden ammattikorkeakoulu. Edita Helsinki.

Pei-Lee, T. and Chen-Chen, Y., 2008. Multimedia University's experience in fostering and supporting undergraduate student technopreneurship programs in a triple helix model. Journal of Technology Management in China, 3(1). pp. 94-108. https://doi.org/10.1108/17468770810851520

Peterman, N.E. and Kennedy, J., 2003. Enterprise education: Influencing students' perceptions of entrepreneurship. Entrepreneurship theory and practice, 28(2), pp.129-144.

Pew Research Center 2022. Writing Survey Questions. Accessed 3.6.2022. https://www.pewresearch.org/our-methods/u-s-surveys/writing-survey-questions/

Philpott, K., Dooley, L., O'Reilly, C. and Lupton, G., 2011. The entrepreneurial university: Examining the underlying academic tensions. Technovation, 31(4), pp.161-170.

Piperopoulos, P. and Piperopoulos, G., 2009. Is Greece finally on the right path toward entrepreneurship, innovation, and business clusters?. International Journal of Public Administration, 33(1), pp.55-59.

Raichaudhur, A., 2005. Issues in Entrepreneurship Education. Decision (0304-0941), 32(2).

Ristimäki, K., 1998. Yliopisto ja yrittäjyyskasvatus – Yrittäjyys yliopistojen koulutusohjelmissa. Selvityksiä ja raportteja 31. Vaasan yliopiston julkaisuja.

Robinson, P.B., Huefner, J.C. and Hunt, H.K., 1991. Entrepreneurial research on student subjects does not generalize to real world entrepreneurs. Journal of Small Business Management, 29(2), pp. 43-50.

Rotter, J.B., 1966. Generalized expectancies for internal versus external control of reinforcement. Psychological monographs: General and applied, 80(1). pp. 1-28.

Römer-Paakkanen, T., 2006. Opettajien yrittäjyyden jatko-opinnot Jyväskylän yliopistossa: Yrittäjyyden säteilyttäminen kaikkeen opetukseen ammattikorkeakoulussa ja toisen asteen ammatillisessa oppilaitoksessa. In Yrittäjyyskasvatuksen uusia tuulia, pp.184-207. Yrittäjyyskasvatuksen julkaisusarja 4/2006. Kyrö, P. & Ripatti, A. (Eds.) Hämeenlinna. Tampereen yliopistopaino.

Röpke, J., 1998. The Entrepreneurial University: Innovation, academic knowledge creation and regional development in a globalized economy. Department of Economics, Philipps-Universität Marburg, Germany, p.2.

Salamzadeh, A., Salamzadeh, Y. and Daraei, M., 2011. Toward a systematic framework for an entrepreneurial university: a study in Iranian context with an IPOO model. Global business and management research: an international journal, 3(1), pp.31-37.

Sarasvathy, S.D., 2001. Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. Academy of management Review, 26(2), pp.243-263.

Say, J.B., 1964. A Treatise on Political Economy. New York. Kelley.

Schulte, P., 2004. The entrepreneurial university: a strategy for institutional development. Higher education in Europe, 29(2), pp.187-191.

Schumpeter, J., 1934. Capitalism, Socialism, and Democracy. New York. NY. Harper & Row.

Shalley, C.E., Zhou, J. and Oldham, G.R., 2004. The effects of personal and contextual characteristics on creativity: Where should we go from here?. Journal of management, 30(6), pp.933-958.

Shane, S. and Venkataraman, S., 2000. The promise of entrepreneurship as a field of research. Academy of management review, 25(1), pp.217-226.

Shane, S., Locke, E.A. and Collins, C.J., 2003. Entrepreneurial motivation. Human resource management review, 13(2), pp.257-279.

Shane, S.A., 2004. Academic Entrepreneurship: University Spinoffs and Wealth Creation. Cheltenham. Edward Elgar Publishing.

Shapero, A. and Sokol, L., 1982. The social dimensions of entrepreneurship. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.

Shattock, M. (ed), 2009. Entrepreneurialism in universities and the knowledge economy. Diversification and organisational change in European higher education. UK. Society for research in higher education and the Open University Press.

Sine, W.D. and Lee, B.H., 2009. Tilting at windmills? The environmental movement and the emergence of the US wind energy sector. Administrative Science Quarterly, 54(1), pp.123-155.

Sitaridis, I. and Kitsios, F., 2019. Entrepreneurship as a career option for information technology students: Critical barriers and the role of motivation. Journal of the Knowledge Economy, 10(3), pp.1133-1167.

Sofroniou, N. and Hutcheson, G.D., 1999. The multivariate social scientist. London. Sage.

Souitaris, V., Zerbinati, S. and Al-Laham, A., 2007. Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. Journal of Business venturing, 22(4), pp.566-591.

Sparkman, R. M., Hair, J. F., Anderson, R. E., Tatham, R. L. and Grablowsky, B. J., 1979. Multivariate data analysis with readings. Journal of Marketing Research, 16. pp.437. https://doi.org/10.2307/2983017

Spector, P.E., 1992. Summated rating scale construction: An introduction. Sage University Papers Series on Quantitative Applications in the Social Sciences; No. 07-082. Newbury Park, CA. Sage.

Sperrer, M., Müller, C. and Soos, J., 2016. The concept of the entrepreneurial university applied to universities of technology in Austria: already reality or a vision of the future?. Technology Innovation Management Review, 6(10), pp.37-44.

Sternberg, R. J., 2006. The Nature of Creativity. Creativity Research Journal, 18(1). pp. 87–98. http://people.uncw.edu/caropresoe/GiftedFoundations/SocialEmotional/Creativity-articles/Sternberg_Nature-of-creativity.pdf

Subotzky, G., 1999. Alternatives to the entrepreneurial university: New modes of knowledge production in community service programs. Higher education, 38(4), pp.401-440.

The World Bank 2000. The Task Force on Higher Education and Society (2000): Higher Education in Developing Coutries. Peril and Promise (Washington DC, The World Bank). Accessed 18.01.2018. http://documents.worldbank.org/curated/en/345111467989458740/Higher-education-in-developing-countries-peril-and-promise

Thompson, E.R., 2009. Individual entrepreneurial intent: Construct clarification and development of an internationally reliable metric. Entrepreneurship theory and practice, 33(3), pp.669-694.

Timmons, J.A., 1989. The Entrepreneurial Mind. Andover, MA. Brick House Publishing.

Timmons, J.A., Smollen, L.E. and Dingee, A.L.M., 1985. New Venture Creation, 2nd ed.. Homewood, IL. Irwin.

Turker, D. and Selcuk, S.S., 2009. Which factors affect entrepreneurial intention of university students?. Journal of European industrial training, 33(2). pp.142-159. https://doi.org/10.1108/03090590910939049

UCLA: Statistical Consulting Group 2022. What Statistical Analysis Should I Use? Statistical Analyses Using SPSS. Accessed 10.4.2022. https://stats.oarc.ucla.edu/spss/whatstat/what-statistical-analysis-should-i-usestatistical-analyses-using-spss/

Valtioneuvosto 2005. Hallituksen politiikkaohjelmat – Yrittäjyys. Accessed 4.11.2008. http://statsradet.fi/tietoarkisto/politiikkaohjelmat/yrittajyys/fi.jsp

VAMK 2006. Vaasan ammattikorkeakoulun esittely 2006. Accessed 15.1.2009. http://www.puv.fi/fi/esittely/

VAMK 2022 a. International and communal organization. Accessed 15.2.2022. https://www.vamk.fi/en/meidan_vamk/me/organisaatio/

VAMK 2022 b. Get to know us. Accessed 15.2.2022. https://www.vamk.fi/en/meidan_vamk/

VAMK 2022 c. AMK-tutkinnot ja ylemmät AMK-tutkinnot. Accessed 15.2.2022. https://www.vamk.fi/haku/amk-tutkinnot/

VAMK 2022 d. Internationality. Accessed 15.2.2022. https://www.vamk.fi/en/meidan_vamk/korkeakoulu/kansainvalisyys/

VAMK 2022 e. VAMK strategy 2030. Accessed 15.2.2022. https://www.vamk.fi/en/meidan_vamk/me/strategia/

VAMK 2022 f. Quality management in VAMK. Accessed 15.2.2022. https://www.vamk.fi/en/meidan_vamk/me/laatu/

VAMK 2022 g. VAMK promotes impact and renewal. Accessed 15.2.2022. https://www.vamk.fi/en/meidan_vamk/me/laatu/itsearvoinnin_osa-alueet/vaikuttavajau-udistavavamk/

Van Praag, C.M. and Versloot, P.H., 2007. What is the value of entrepreneurship? A review of recent research. Small business economics, 29(4), pp.351-382.

Vesper, K.H. and Gartner, W.B., 1997. Measuring progress in entrepreneurship education. Journal of Business venturing, 12(5), pp.403-421.

Vipunen - opetushallinnon tilastopalvelu 2022. Career Monitoring, funding model questions. Opetushallinnon ja Tilastokeskuksen tietopalvelusopimuksen aineisto 2.10. Accessed 20.2.2022. https://vipunen.fi/en-gb/_layouts/15/xlviewer.aspx?id=/en-gb/Reports/Ammattikorkeakoulutus%20-%20uraseuranta%20-%20rahoitusmalli%20-%20amk_EN.xlsb

Wennekers, S. and Thurik, R., 1999. Linking entrepreneurship and economic growth. Small business economics, 13(1), pp.27-56.

Wilson, K.E., 2008. Entrepreneurship education in Europe. Entrepreneurship and higher education. OECD. pp. 1–20.

Wilson, K.E., Vyakarnam, S., Volkmann, C., Mariotti, S. and Rabuzzi, D., 2009. Educating the next wave of entrepreneurs: Unlocking entrepreneurial capabilities to meet the global challenges of the 21st century. In World Economic Forum: A Report of the Global Education Initiative.

Wong, P.K., Ho, Y.P. and Autio, E., 2005. Entrepreneurship, innovation and economic growth: Evidence from GEM data. Small business economics, 24(3), pp.335-350.

Woodman, R.W., Sawyer, J.E. and Griffin, R.W., 1993. Toward a theory of organizational creativity. Academy of management review, 18(2), pp.293-321.

Wright, M., Clarysse, B., Lockett, A. and Knockaert, M., 2008. Mid-range universities' linkages with industry: Knowledge types and the role of intermediaries. Research policy, 37(8), pp.1205-1223.

Zahra, S.A., Rawhouser, H.N., Bhawe, N., Neubaum, D.O. and Hayton, J.C., 2008. Globalization of social entrepreneurship opportunities. Strategic entrepreneurship journal, 2(2), pp.117-131.

Zhao, H., Seibert, S.E. and Hills, G.E., 2005. The mediating role of self-efficacy in the development of entrepreneurial intentions. Journal of Applied Psychology, 90(2). pp. 1265-1272.

Zollo, L., Laudano, M.C., Ciappei, C. and Zampi, V., 2017. Factors affecting universities' ability to foster students' entrepreneurial behaviour: An empirical investigation. Journal of management development, 36(2), pp. 268-285. https://doi.org/10.1108/JMD-06-2016-0093

APPENDICES

APPENDIX 1. Sample characteristics - Demographic

Sample characteristics (Profile - Demographic)

Variable	Label (Questions in survey)	N	%
Region	Which region are you from?		
	a.Asia	10	22 %
	e.Europe	35	78 %
Gender	What is your gender?		
	a.Male	24	53,3%
	b.Female	21	47 %
Study_Unit	What is your study unit?		
	a.School of Technology	20	44,4%
	b.School of Business	20	44,4%
	c.School of Health Care and Social Services	5	11 %
Year	I am a _____ student.		
	a.First-year	12	26,7%
	b.Second-year	14	31,1%
	c.Third-year	8	17,8%
	d.Fourth-year	7	15,6%
	e.Master's degree	2	4,4%
	f.Study time extended	2	4 %
E_experience	What is your experience of entrepreneurship?		
	a.Have been a solo entrepreneur or freelancer, or self-employed with no employee	4	8,9%
	d.Have been working in a start-up venture during its very early stage and contributed to the initial business routine setups	4	8,9%
	e.No experience at all	37	82 %
Course_availability	Have entrepreneurship courses been available or introduced to you?		
	a.Yes	35	77,8%
	b.No	10	22,2%

APPENDIX 2. Sample characteristics – Culture and Influence

Sample characteristics (Profile - Culture/Influence)

Variable	Label (Questions in survey)	N	%
Culture	What has been the entrepreneurial culture in your growing environment? Choose the most suitable description.		
	a.Entrepreneurship is highly advocated, environment is entrepreneurship-friendly and supporting both healthy competition and co-operation. Networking is a norm and highly efficient. It is not complicated to set up and run own business. Many people choose to be an entrepreneur, be it big or small.	9	20,0%
	b.Entrepreneurship is just one of the many options to make a living, it is difficult to say whether entrepreneurship has been advocated or not. It is not too complicated to be an entrepreneur. People might be 'pushed' to be an entrepreneur as it is not easy to find a good job, or they somehow suffer from barriers to enter into certain social network or status. Being entrepreneurial and successful in business seems to be an important way to gain recognition to own value, effort and status.	24	53,3%
	c.Entrepreneurship is not promoted with great effort, it is relatively complicated to establish business, and resource and support is limited or difficult to obtain. People prefer to find a job as it is more stable or simple.	9	20,0%
	d.None of the options above applies.	3	6,7%
Role_model_Passive	Are some of your family, friends or acquaintances entrepreneurs? And how have they impacted your attitude towards entrepreneurship?		
	a.Yes and positively.	17	37,8%
	b.Yes and negatively.	5	11,1%
	c.Yes but no impact.	14	31,1%
	d.None of my family, friends or acquaintances are entrepreneurs.	9	20,0%
Role_model_Active	Which description is the most aligned with your situation?		
	a.I like to read stories on entrepreneurs or actively follow news about them or their companies, they motivate me to be an entrepreneur in the future.	7	15,6%
	b.I have read about some stories or news on entrepreneurs, they shape my positive attitude towards entrepreneurship.	14	31,1%
	c.I don't follow too much stories or news on entrepreneurs, but my attitude towards entrepreneurship is somehow quite positive.	17	37,8%
	d.I'm not so interested in entrepreneurship, I don't think I will become one.	7	15,6%

APPENDIX 3. Sample characteristics – Personality (with value "Yes")

Sample characteristics (Profile - Personality)

Variable	Label (Questions in survey)	N	%
P_risk	In the worst case, despite much uncertainty, and the risk of failure and losing what I would have invested, it is still worth of trying. What if I succeed? And the reward is attractive.	26	57.8%
P_LOC	I am able to control and influence my destiny with my ability, effort, or skills. I am responsible for what happens (or what hasn't happen) to me.	40	88.9%
P_creativity	It is easy for me to come up with new ideas and I tend to find better ways to do things.	29	64.4%
P_Alertness	I tend to recognize chances and take advantage of them in a proper way, to achieve my expectation.	25	55.6%
P_Spontaneous_learning	I proactively search and obtain the knowledge or information I needed.	39	86.7%
P_Adeptness	I tend to learn the "rules", observe the situations, and make the right actions at the right time.	34	75.6%
P_Resilience	I endure and cope with difficulties. I don't easily give up trying.	35	77.8%
P_Commitment	I set and achieve goals by own efforts. I would go the extra miles for accomplishment.	38	84.4%

APPENDIX 4. Sample characteristics – Needs and Expectations

Sample characteristics (Profile - Need/expectation)

Variable	Label (Questions in survey)	N	%
Learning_intention	What is your main intention in enrolling to entrepreneurship courses?		
	a.I would like to learn for entrepreneurship and prepare myself because I intend to be or I am very likely to be an entrepreneur in the future.	4	8,9%
	b.I would like to learn about entrepreneurship because this topic is interesting or relevant to me, and the knowledge and skills from this topic might benefit me in my career and personal development.	18	40,0%
	c.I need to learn about entrepreneurship because these courses are compulsory in my study program.	12	26,7%
	d.I have not enrolled, nor will I plan to enroll, to any entrepreneurship courses.	11	24,4%
Entrepreneurial_intention	Do you intent to be an entrepreneur or choose self-employment as a career option?		
	e.No, I don't think I want to be an entrepreneur or choose self-employment as a career option	8	17,8%
	d.I don't know or I'm not sure, and time will tell	26	57,8%
	c.Yes but at some point after 3 years from graduation when I feel ready	6	13,3%
	b.Yes and within 3 years after graduation	4	8,9%
	a.Yes and right after graduation	1	2,2%

APPENDIX 5. Descriptive statistics of variables measuring entrepreneurship fostering factors

Descriptive Statistics (Entrepreneurship Fostering Factor)

Variable	Label (Questions in survey)	N	Min.	Max.	Mean	SD
Need_perception	I have in-depth perception or knowledge of entrepreneurship.	45	1	5	3,47	1,217
Need_attitude	I have shaped my own personal values, belief, identity and attitude towards entrepreneurship.	45	1	5	3,38	1,248
Need_motivation	I have the enthusiasm/passion for entrepreneurship and I am strongly motivated and encouraged for taking entrepreneurial actions.	45	1	5	3,76	1,264
Need_selfefficacy	I have the needed entrepreneurial competence and experience because it enhances my confidence and the chance of success in entrepreneurship.	45	1	5	3,20	1,254
Competence1	Business knowledge	45	1	5	3,91	1,311
Competence2	Domain knowledge from a specific, specialized field or industry	45	1	5	3,84	1,186
Competence3	Social / market knowledge	45	1	5	4,07	1,009
Competence4	Self-directed / spontaneous learning	45	1	5	3,98	1,158
Competence5	Cognition and analysis	45	1	5	3,84	1,021
Competence6	Creative thinking	45	1	5	4,16	1,021
Competence7	Decision making	45	1	5	4,47	0,968
Competence8	Adeptness and flexibility	45	1	5	4,38	1,051
Competence9	Resilience	45	1	5	3,69	1,240
Competence10	Strategic thinking	45	1	5	4,22	1,085
Competence11	Opportunity recognition and evaluation	45	1	5	4,16	0,976
Competence12	Problem solving	45	1	5	4,47	0,991
Competence13	New product / service prototyping and development	45	1	5	3,36	1,069
Competence14	Resource utilization and configuration	45	1	5	3,60	1,136
Competence15	Business planning and organizing	45	1	5	4,00	1,087
Competence16	Risk management	45	1	5	4,09	0,973
Competence17	Leadership	45	1	5	4,13	1,014
Competence18	Teamwork	45	1	5	4,31	1,019
Competence19	Networking	45	1	5	4,16	1,086
Competence20	Relationship handling, stakeholder management and communication	45	1	5	4,00	1,168
Experience1	Co-operate with local businesses regarding real-life project work or guest lecturing, etc	45	1	5	3,67	1,225
Experience2	Promote open innovation or the development of new solutions for existing challenges via close and diverse collaboration with government, industry and other knowledge institutions	45	1	5	3,47	1,179
Experience3	Simulate entrepreneurship process with experiential learning activities or other events	45	1	5	3,47	1,217
Experience4	Mentoring or coaching programs	45	1	5	3,64	1,190
RS1	Platforms for teambuilding	45	1	5	3,22	1,223
RS2	Practical information that is highly relevant for starting a business	45	1	5	3,96	1,205
RS3	Support in building organizational routines such as idea and risk evaluations, marketing, etc.	45	1	5	3,84	0,976
RS4	Legal and business consultancy	45	1	5	3,78	1,223
RS5	Clear referral or other measures that facilitate networking and collaborations with other financial and business sectors	45	1	5	3,31	1,104
RS6	Access to research results or knowledge / technology resource	45	1	5	3,71	1,058
RS7	Initial fund or other financing possibilities for entrepreneurship	45	1	5	3,29	1,308
RS8	Facility such as office or laboratory space, IT and administrative service	45	1	5	3,33	1,243

APPENDIX 6. Descriptive statistics of variables on evaluation of VAMK's environment

Descriptive Statistics (Evaluation)

Variable	Label (Questions in survey)	N	Min.	Max.	Mean	SD
Evaluation_perception	My perception of entrepreneurship has been enhanced.	45	1	5	2,91	1,221
Evaluation_attitude	I have shaped my own personal values, identity and positive attitude towards entrepreneurship.	45	1	5	3,09	1,258
Evaluation_motivation	My motivation for entrepreneurship has been developed or strengthened, and my desire for entrepreneurial actions has been raised.	45	1	5	3,00	1,314
Evaluation_selfefficacy	My confidence in performing entrepreneurial behavior has increased.	45	1	5	2,93	1,195
Evaluation_competence	VAMK provides entrepreneurship education that builds up entrepreneurial knowledge and competence.	45	1	5	3,18	1,072
Evaluation_experience	VAMK provides inspiration for entrepreneurship and business experience via real projects, teamworks, activities or events, etc	45	1	5	3,16	1,043
Evaluation_RS	VAMK provides resources, support, or incubator service for initial entrepreneurial activities.	45	1	5	2,60	0,915
Evaluation_Culture1	VAMK raises students' interest and increases their engagement in entrepreneurship.	45	1	5	2,96	1,167
Evaluation_Culture2	VAMK creates a culture that encourages entrepreneurial mindset, spirit and behavior.	45	1	5	2,96	1,043
Evaluation_network	VAMK establishes and facilitates effective network or close collaborations with industry or government.	45	1	5	3,02	1,011
Evaluation_RDI	VAMK acts and responds entrepreneurially to the social / market need with innovation and its own knowledge assets	45	1	5	2,84	0,976

APPENDIX 7. Survey questionnaire

Fostering entrepreneurship or