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Master of Science in Management Engineering

Master's thesis:

**Study of the increased future employability of students
working for Junior Enterprises**

In collaboration with JADE – the European Confederation of Junior Enterprises



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This thesis was elaborated in the framework of the double degree program *Master of Science in Management Engineering* between the two universities *Universitat Politecnica de Catalunya* (Barcelona, Spain) and *Politecnico di Torino* (Turin, Italy). Due to the different regulations in the universities, there are slight differences in the formalities and the title of the present work. The title at Politecnico di Torino is *“Analysis of students’ intentions towards entrepreneurship influenced by the experience of working for a Junior Enterprise”* and supervisors are Prof. Elisa Ughetto and Prof. Paolo Landoni.

ABSTRACT

The present thesis contains an analysis of students' intentions towards entrepreneurship and their increased employability influenced by the experience of working for a Junior Enterprise. It is based on an empirical study about the identity of members of the European Junior Enterprise network (JADE) as well as a literature research among academic studies and several studies conducted by the European Commission about Entrepreneurship in higher education. Key findings are the positively influenced entrepreneurial intentions of students and the increased feeling of preparedness for the job market thanks to their work for a Junior Enterprise.

Keywords: EMPLOYABILITY, JUNIOR ENTERPRISE, JE, ENTREPRENEURSHIP, EUROPE, JADE, JUNIOR ENTREPRENEUR, STUDENTS, EUROPEAN COMMISSION, EUROPEAN CONFEDERATION OF JUNIOR ENTERPRISES

EXECUTIVE SUMMARY

The traditional formal education system is valuable and highly important for the learning of technical skills and knowledge. However, there is a clear gap between theoretic knowledge and interpersonal as well as practical skills development in this system. These practical and soft skills can be learned in the way of non-formal or informal education. The purpose of this thesis is to compare and evaluate ways to close the gap between university and the real job market. Different initiatives by higher education institutions in order to foster entrepreneurship among students have been studied. A broad variety of entrepreneurial programs, project-based learning concepts and innovation labs have been found. This is compared to the non-formal way of education for example in the form of complementary extra-curricular activities for students to empower their self-development. Thus, the special case of Junior Enterprises (JEs), a concept existent since 1967 is analyzed for its impact on students in higher education.

Scientifically, it shall be analyzed whether the concept of JEs has a measurable impact on students in terms of their attitudes and intentions towards entrepreneurship as well as readiness for the real job world which awaits them after their graduation.

As first step, broad literature research on the topic of entrepreneurship in higher education has been done. It is quoted as a best practice¹ to equip students with the needed skills for the job market, not only to become entrepreneurs themselves but far more establish an entrepreneurial mindset as a complementation of their skills and boost for their employability. Subsequently, JADE - the European umbrella organization has been studied for its role in engaging, empowering and fostering entrepreneurship among students. The scientific research was based on an empirical study among Junior Entrepreneurs and their identity, experience in the JE network, their intentions and attitudes towards entrepreneurship and the job market. The data collected in this survey was analyzed in a regression analysis to find significant correlations between the student's activity in a JE and their developed skills, international propensity or future career plans.

Major outcomes of the research show that there is a clear positive effect of the time a student spends working for a JE on their intentions towards entrepreneurial action. Besides, the amount of industry related projects a student has actively contributed to

¹ Compare *APPENDIX 1: Support*.

whilst being a member of the JE has been found positively correlated to the wish of being employed in the private sector and thus the feeling of being prepared for the job market. Other influences on entrepreneurial intentions like international propensity or the attitude of a student towards volunteering as well as further work experience could not be validated by the analysis.

The results found in the present research can be translated into other fields as well. In general, it can be assumed that a student who is active in an association alongside his studies, connecting with other students and working on his self-development, he will feel more prepared and self-confident for both, starting entrepreneurial action or beginning a corporate career. So, the activity of a student in a Junior Enterprise are of course not the only way of acquiring entrepreneurial skills and attitudes. The concept of putting the theoretically learned into practice and acquiring skills by performing extra-curricular activities is also supported by other student's associations like for example AIESEC², ESTIEM³ or ESN⁴. In the specific field of student entrepreneurship, there are organizations with a similar model like for example Junior Achievement⁵ who are focusing on primary and high school students, or 180 Degrees Consulting⁶ who are active in the field of social entrepreneurship, always based on a student-volunteering model. All these organizations have an important contribution on entrepreneurship and skills development among students.

However, JADE's exclusiveness lays in the fact that is entirely run by and for students. The structure of a bottom-up organization, which emerged thanks to the urge of students for complementing their University studies and grew into a global network of like-minded students speaks for the uniqueness of this concept. By adding the JE

² "Developing the leadership potential of youth through experiential learning, volunteer experiences and professional internships.", retrieved from <http://aiesec.org/>.

³ "Organisation for European Students of Industrial Engineering and Management, who combine technological understanding with management skills. Our goal is to establish and foster relations between students.", retrieved from <https://www.estiem.org/>

⁴ "Our mission is to represent international students, thus provide opportunities for cultural understanding and self-development under the principle of Students Helping Students."

⁵ "JA's volunteer-delivered, kindergarten-12th grade programs foster work-readiness, entrepreneurship and financial literacy skills, and use experiential learning to inspire students to dream big and reach their potential.", retrieved from <https://www.juniorachievement.org/>

⁶ "We improve education, reduce homelessness, and alleviate poverty by helping non-profits receive the support and expertise they need to improve and expand their services. At the same time, we develop a generation of future leaders committed to making a difference.", retrieved from <http://180dc.org/>

experience to the portfolio of Universities, best synergies are evoked as the combination of formal and non-formal education – university and extra-curricular activities is the most beneficial when it comes to the development of technical skills, knowledge and soft skills as a base for entrepreneurial activity.

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Introduction

In the recent years, not only politicians but also higher education institutions and companies have discovered the urgent necessity for entrepreneurial skills among students. Not only for creating future entrepreneurs but also intrapreneurs⁷ and furthermore for preparing students for the challenges in the job market. Entrepreneurship education is also described “as a method whereby students (of all types) practice creating, finding, and acting on opportunities of creating value” (Neck, 2014) (Neck, 2011). In general, the entrepreneurial activities within a University include different curricular and extra-curricular elements, as well as research efforts (Kuratko, 2005). In the present thesis, the main focus is on extra-curricular activities in the entrepreneurship education field.

In detail, the option for students to work in so-called Junior Enterprises (JEs), alongside their studies gives them the bespoke opportunity of learning and experiencing entrepreneurship in a safe or low-risk environment. By doing this, the students are achieving a unique hands-on experience of non-formal education where they can put into practice the skills learned by formal education in the classroom. Currently, the JEs are on European level confederated by JADE, which represents a network of over 22.000 students Europe wide. JADE is a non-profit non-governmental organization affiliated to the European Commission and the European Parliament and is based in Brussels.

This thesis is being elaborated in order to give a scientific proof of this fostering of entrepreneurial mindset as well as the skills development thanks to the JE. The analysis of the entrepreneurial intentions of students influenced by their experience of working for a JE is based on an empirical study about a Census and Identity survey within the European JE network as well as a study conducted by the European Commission about Entrepreneurship in higher education.

⁷ Entrepreneurially acting employees within an organization.

As first step, an extensive research about the status quo of entrepreneurship education has been done and a research among academic literature has been conducted to understand the background. Then, an overview of the JE concept and the importance of JADE in the European within the European education eco-system is given. The initiatives of fostering entrepreneurship by JADE and by higher education institutions are, among other, followed to contribute to the focus of Horizon 2020, a directive of the European Commission in order to bring Europe a step forward in terms of economic growth and competitiveness (Bacigalupo, et al., 2016). Other than the study conducted by the European Commission among alumni of the JE network, the present thesis analyses the mindset and attitudes of students currently active in JEs towards their future career wishes, besides the correlation between their education and attitude towards entrepreneurship is measured by a regression analysis.

Subsequently, chapter 3 explains the methodology followed for the present research. First, data about the Junior Entrepreneurs' identity has been collected by an online survey. Subsequently the dataset is cleaned and prepared. After analyzing and understanding the dataset, some descriptive statistics are done in order to showcase the identity and variety of students active in the JE movement. For the analysis of the recorded data, two research hypotheses are defined and based on them, the regression model and interesting variables are decided. Following, correlation analyses as well as multinomial regressions, are performed. For the data analysis, the econometrics software STATA has been used. This tool was part of the industrial economics course at Politecnico di Torino and its functionality was studied autonomously. Finally, the results are interpreted and the evaluation of the hypotheses performed. After pointing out the limitations of the present study, the conclusion serves also to give a future outlook on the JE movement on the background of entrepreneurial development.

1. Entrepreneurship Education

1.1 Why Entrepreneurship Education?

The European Commission has done huge efforts in the past years and by the means of Horizon 2020 will continue to do so in the next couple of years. Why is the Commission putting so much resources and commitment into the education of entrepreneurs?

The youth unemployment rates in Europe are on their climax, reasons are the missing opportunities as well as the poor preparation of students for the job market, due to a lack of practical experience. Besides, the Commission is trying together with other stakeholders to fight the lack of entrepreneurial culture. According to a research conducted in the field, as it can be seen in the graph below, one of four young Europeans are unconfident to be able to find a job when finishing their education.⁸

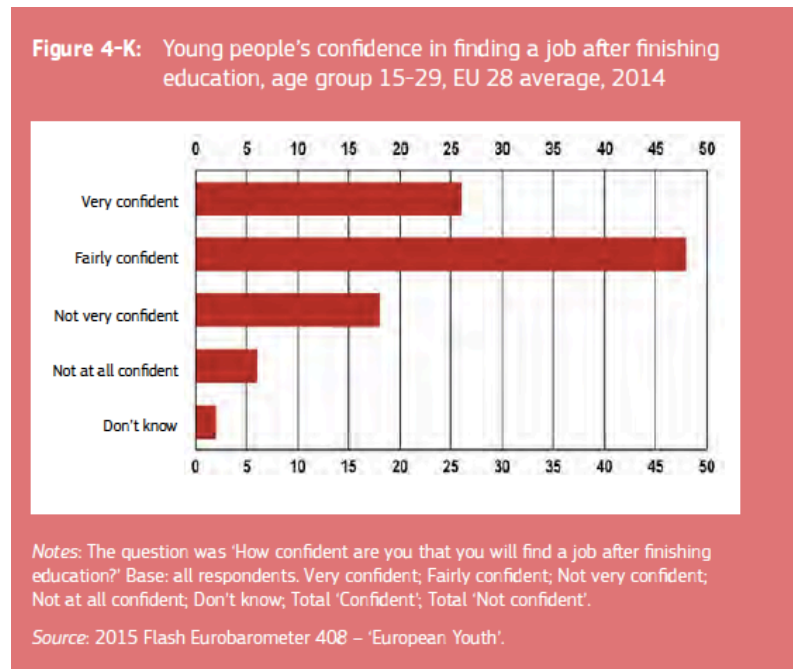
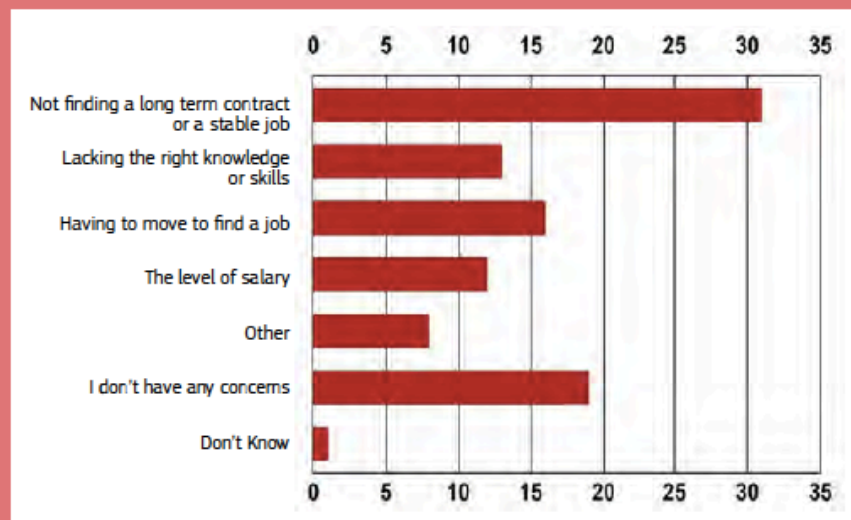


Figure 1: Young people' confidence in finding a job after graduation (European Union, 2015)

Furthermore, as it can be seen in *Figure 2*, one third of people aged between 15 and 29 years are afraid of not finding a stable job and almost 15% are concerned about not having the right knowledge or set of skills in order to succeed in the job market.

8 (European Union, 2015)

Figure 4-L: Young people's main concerns when thinking about getting a job, age group 15-29, EU-28 average, 2014



Notes: The question was 'What would be your concerns when you think about getting a job? Firstly (main reason)? Base: respondents who are still studying. Not finding a long term contract or a stable job; Lacking the right knowledge or skills; Having to move to find a job; The level of salary; Other; I don't have any concerns; Don't know.

Source: 2015 Flash Eurobarometer 408 – 'European Youth'.

Figure 2: Young people's main concerns when thinking about getting a job (European Union, 2015)

Figure 3 suggests that, in addition, every second young person explicitly says, they would not like to start a business and almost one quarter of young people thinks to start a business is too difficult, even if they would like to – opposed to a very low percentage of roughly 15% would definitely consider starting an own business.

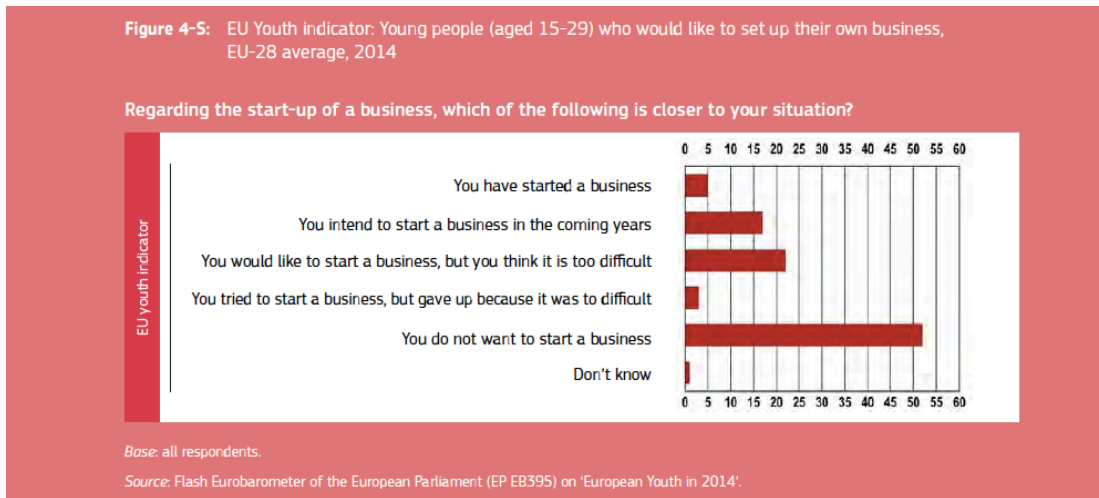


Figure 3: EU Youth indicator: young people about setting up their own business (European Union, 2015)

As it can be seen in these inquiries, there is a huge need for the improvement of opportunities for Europe’s young people and an even bigger need for spreading the entrepreneurial culture in order to achieve a positive contribution on society.

1.2 What is Entrepreneurship education?

As mentioned above, entrepreneurship education is the training of entrepreneurial skills and knowledge as well as the fostering of entrepreneurial attitudes and mind-sets among students. This is mostly done by a combination of formal, non-formal and informal education. This means, a combination of traditional theoretic lectures, practical exercises and activities outside the classroom. Entrepreneurship education helps to achieve competences with the aim of raising consensus among all stakeholders and to establish a bridge between the worlds of education and work. The Entrepreneurial Competences Framework consisting of the combined method mentioned above, shall foster entrepreneurial capacity of European citizens. The basic three competence areas are interrelated and interconnected, in specific: ‘Ideas and opportunities’, ‘Resources’ and ‘Into action’ (Bacigalupo, et al., 2016).

1.3 Literature review on academic papers about entrepreneurship education

To understand the context of entrepreneurship in higher education, a review of existing literature has been concluded. In the following paragraphs, different methods of equipping students with entrepreneurial skills during their academic career are presented. To start with, existing academic research about JEs is presented. Following, the classification of the young entrepreneur: skills, attitudes and knowledge which have been defined as necessary prerequisites to make students employable are illustrated. The chapter will be concluded by the presentation and evaluation of entrepreneurship programs which are existent in the European academia and the entrepreneurship study programs are compared versus the JE concept.

The Global University Entrepreneurial Spirit Students' Survey (GUESSS) (Bergmann, et al., 2016). *GUESSS is an international research project that investigates and compares entrepreneurial intentions and activities of students in 26 countries⁹ in the world* (Bergmann, 2015).

It has been established in 2003 and has been rolled out every two to three years, adding further countries in each edition of the survey. On the background of this project, a research among 12 German Universities has been conducted about the ability of students for the recognition of business opportunities and their capabilities of turning them into action. The research suggests that there are different requirements that enable entrepreneurial action: knowledge about entrepreneurship and human capital, which means the set of skills and beliefs that facilitate putting ideas into action. "Even if people had the same knowledge, their beliefs, attitudes and personality characteristics would lead to different perceptions concerning a potential entrepreneurial opportunity." This supports the assumption on the base of the present thesis, that formal education¹⁰ is not sufficient to facilitate entrepreneurial capabilities among students. The beliefs

⁹ In 2011 the edition that served as a base for Bergman's paper, the following countries have taken part: Argentina, Austria, Belgium, Brazil, Chile, China, Estonia, Finland, Germany, Greece, Hungary, Ireland, Japan, Liechtenstein, Luxembourg, Mexico, Netherlands, Pakistan, Portugal, Romania, Russia, Singapore, South Africa, Switzerland, UK.

¹⁰ Definition: Formal education: the hierarchically structured, chronologically graded 'education system', running from primary school through the university and including, in addition to general academic studies, a variety of specialized programs and institutions for full-time technical and professional training (Smith, 2012)

and attitudes can only be formed and develop by non-formal¹¹ learning. According to the study, knowledge and human capital can be acquired in different ways: formal learning (in University lectures) or by professional industry experience (Bergmann, 2015).

The study also suggests, that there is a significant difference between research-based business opportunities and non-research based opportunities. Especially research-based opportunity beliefs are more connected to uncertainty and thus require more experience than non-research based. “Having acquired knowledge about entrepreneurship and starting a business does not help people in reducing the uncertainty about the feasibility and fit of a specific business idea.” (Bergmann, 2015). The near elimination of uncertainty, can only be achieved by experience, or the opportunity to test the opportunity in a safe environment, which is the case for example in a JE. This is another support for the underlying assumption of this thesis.

The study concludes that *different types of knowledge relatedness are important for research-driven and non-research-driven venture ideas. Whereas relevant professional experience and, thus, tacit knowledge is important for research-driven ideas, non-research-driven ideas benefit from general human capital, specifically, codified knowledge obtained during university studies. Opportunity beliefs relate to entrepreneurial action. However, we find such a relationship only for non-research-driven venture ideas and not for others suggesting that different types of uncertainty are prevalent in the two cases.*

Another study based on the GUESSS Project is researching the question:

“To what extent and in what way do the university and the regional context influence university students’ decision to take first entrepreneurial action and, subsequently, to establish a new business?” (Bergmann, et al., 2016). To assess this question, the research differentiates between students who have already taken first actions for creating a start-up – so-called nascent entrepreneurs – and students who are already entrepreneurs. Always under consideration of the different stages of the “entrepreneurial process” (Carter, 1996). Like mentioned above, also this

¹¹ Definition: Non-formal education: any organized educational activity outside the established formal system – whether operating separately or as an important feature of some broader activity – that is intended to serve identifiable learning clienteles and learning objectives (Smith, 2012)

paper sees a significant difference between research-based and non-research-based business ideas and the different degree of involved knowledge transfer.

The study proves that the organizational context for students is more important for the intentions to start a business than for the final real enterprise creation. It also shows that regional circumstances are highly important for the real enterprise creation but not significant for the student's intentions to start a business. Besides, the study gives proof for the phenomenon of peer-influence: the ambient of fellow students who follow entrepreneurship education has a positive effect on the student's intentions to become entrepreneurs (Carter, 1996). This as well, is an effect which is given by the JE concept. By working for a JE, students do not only benefit from this peer-effect but they also gain valuable experience from working on projects for firms in the industry. This industry experience in an early stage, even before graduating gives students an advantage compared to other students. The results of the study show that formal entrepreneurial learning does have a positive effect on the individual's intentions to become entrepreneurs, while it does not have a significant effect on the real creation of enterprises. It also states the lack of professional experience and market knowledge as main reason why entrepreneurial ambitions of students are postponed or fail. Bergmann et. al. (2016) also suggest that "Industry experience seems to be even more valuable for entrepreneurial performance than academic knowledge". This, again, supports the concept of students working in a JE alongside their studies.

Different academic papers discussing the benefits of JEs are already existing, like for example "International Experiential Learning in Engineering" (Bakies & Lamb, 2014) which explains the rise of the JE concept in the United States, initiated by the wish to implement Project-Based-Learning methodology at the 6th best Engineering University of the United States, University of Illinois (colleges.usnews, 2016). This paper stresses mainly the other aspect of JEs. Other than just providing the entrepreneurial skills, competences, attitudes and setting, it also serves to prepare students adequately for the job market. It offers a possibility to combine formal (classroom) and non-formal (student's association) learning.

This is also supported by the fact, that even commercially published books like "Human Resources Management in Consulting Firms", published by Springer Verlag, are referring to the JE concept. The confederation of JEs in Germany is connected closely to a variety of large consulting firms, who confirm Junior Entrepreneurs as

properly skilled for the challenges in the job market and therefore recruit their future talent preferably among JE alumni (Domsch & Hristozova, 2006).

The JE movement is recently growing as well in Turkey, where a study has been conducted in order to find influencing factors for entrepreneurial intentions of university students (Turker & Selcuk, 2009). It also brings a new dimension into the picture, which is the correlation of entrepreneurial intentions not only with perceived educational support but also with a certain level of self-confidence of the individual as well as the perceiving of structural support in the society. It has been proven that a self-confident individual given the structural and educational support of his environment rather have intentions to become entrepreneur than others.

Conditions under which entrepreneurship education may be most effective for enhancing entrepreneurial intentions have been analysed by a study of Maersch (Maersch, et al., 2016). Also the role of motivational drivers and the academic backgrounds have been analysed. In general, the paper proves the positive effect of entrepreneurship education on entrepreneurial intentions. But it also states that mostly students from business related fields benefit from entrepreneurship education which in general has a positive but rather low effect. For science and engineering students there is still a lack of entrepreneurship education, which could according to the paper be solved by implementing “Lean Start-up based classes” (Maersch, et al., 2016) in the curriculum. The paper stresses also the still existing gap between entrepreneurial intentions and actions, it suggests the improvement of entrepreneurship education in order to fight the main barriers: action fear, action uncertainty, and competing interests (van Gelderen, 2013). It furthermore suggests that a significant effort is still to be performed in order to adapt entrepreneurship education to the specific needs of distinct groups of students, which can only be done with a deep understanding of the challenges and barriers these specific target groups face, resulting from own experience. Both, the suggested integration of lean start-up and the adaption to specific needs of students in regards to entrepreneurship education, can be facilitated by supporting students to set up a JE at their University.

According to the study conducted by Wong (2014) among university students in Singapore, the participation especially in experiential-learning entrepreneurship programs at universities have a significant positive influence on students’ entrepreneurial engagement. The study also confirms the effect of program participation on the students’ attitudes and perceptions (Wong, et al., 2014). It strongly

suggests the *move toward hands-on experiential programs as a more effective way for educational institutions to influence students' entrepreneurial behavior and encourage venture creation activity on campus* (Wong, et al., 2014). Which is again a support for the JE concept as the purest concept of experiential learning.

1.4 Classification of the young entrepreneur

The main goal of entrepreneurship in education, apart from taking away the syndrome of the fear of failure from the student, is the acquisition of an entrepreneurial mind-set as well as a set of skills required to become entrepreneur. Various scientific researches have been conducted in order to analyse and define the bespoke set of skills. This paragraph is based on the information by a study conducted by the European Commission in collaboration with JADE (Gibcus, et al., 2012). In the bespoke study, the key competences of an entrepreneur have been classified as a mix of: Attitudes, Skills & Knowledge (Gibcus, et al., 2012).



Figure 4: Entrepreneurial Key Competences¹²

12 Own illustration.

In the following illustrations each of the classifications is explained in detail:

Attitudes



Figure 5: Entrepreneurial Attitudes¹³

1.4.1 Attitudes

The study shows that entrepreneurs excel in: risk propensity and need of achievement. Risk propensity refers to an individual's tendency to take risk in his or her actions. JADE alumni have, according to the study, a higher risk propensity compared to the other groups. Moreover, there is also a difference in the willingness to take risks between male and female alumni. According to the study, Male JADE alumni appear to be the most willing to take risks. This can be explained by the fact that, students who have created a JE in their university have already overcome the psychological barrier of starting their own business. Subsequently, they are more self confident, so they are more averse in taking risks compared to the other groups of students. Finally, the study suggests that in general males tend to have a higher risk propensity than females. The need of achievement explains the human capacity to set and fulfil personal and achievable goals. JADE alumni receive the highest scores also

13 Own illustration

in this category, followed by the entrepreneurship alumni, both far above the level of the alumni control group. An interesting observation is that males within the alumni entrepreneurship group have a higher need of achievement than females. Whereas this does not happen for the JADE alumni: here, male and female alumni have the same need of achievement. Summing up, both genders of JADE alumni have the highest score in terms of need of achievement. Finally, the study underlines that for the two core aspects of entrepreneurial attitude, the need for achievement and the behaviour toward risk, JADE alumni are on the highest rank (Gibcus, et al., 2012).

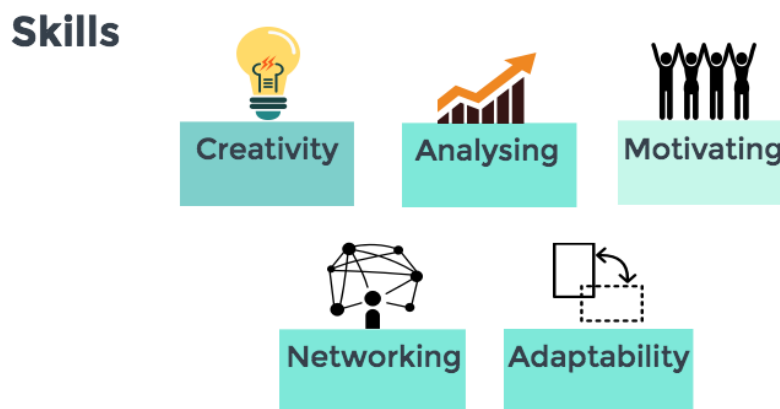


Figure 6: Entrepreneurial Skills¹⁴

1.4.2 Skills

Talking about entrepreneurial skills means talking about the ability of turning ideas into action. All interviewees agree on the fact that higher education has provided them with the skills and know-how enabling them to run a business. It must be said that a subject in a theoretical way is different from putting the acquired knowledge into practice in a safe environment. JADE alumni have this chance to apply what they have studied in the classroom while working for a JE practically. Depending on the field of study and on the core business of the JE, different types of services are offered to the JE's clients and therefore different skills are learned. Therefore, JADE alumni scored best in all the analysed characteristics.

¹⁴ Own illustration.

In particular, JADE alumni score significantly higher in networking skills. This factor can be explained as JADE is a network of JEs. Junior Entrepreneurs are very well aware of the importance of networking, not only for the exchange of best practices and collaboration for projects but much more for their professional career and as a way to collect contacts that can be used in the future. Moreover, Junior Entrepreneurs often attend networking events as well as conferences and congresses where they can develop their networking skills. No differences between male and female in networking skills were noticed.

Another relevant skill where JADE alumni score best is motivation. Motivation is the ability of motivating oneself and others. This skill is very important to gain support and assistance in realizing opportunities. The fact that JADE alumni score highest can be explained once more by the fact that JADE alumni participate in running JEs and as for that they already have experience in motivating different stakeholders. Among the stakeholders, there are for example their JE colleagues or other students that can be interested in joining the JE as well as potential clients (Gibcus, et al., 2012).

1.4.3 Knowledge

This aspect refers to having a clear understanding and knowledge on entrepreneurship including the role of entrepreneurs in today's world. Alumni of the two entrepreneurial groups have a better knowledge of entrepreneurship compared to the control group. JADE alumni score the highest in the "knowledge of entrepreneurship". This can be explained as JADE vision by 2018 is to be considered as the expert network on student entrepreneurship.

Table 1 Self-perception of the Key Entrepreneurship Competence by entrepreneurship alumni, JADE alumni and control group alumni

	<i>Entrepreneurship alumni</i>	<i>JADE alumni</i>	<i>Control group alumni</i>
Attitude			
Sense of initiative	***	**	*
Risk Propensity	**	***	*
Self-efficacy	=	=	=
Need for achievement	**	***	*
Structural behaviour	**	*	**
Skills			
Creativity	**	**	*
Analysis	**	***	*
Motivation	**	***	*
Networking	**	***	*
Adaptability	**	***	*
Knowledge			
Understanding role entrepreneurs	***	**	*
Knowledge of entrepreneurship	**	***	*

Note: *** highest, ** medium, * lowest, = equal

Source: EIM, 2011.

Figure 7: Self-perception of Alumni (Gibcus, et al., 2012)

1.5 Entrepreneurial programs in higher education versus JE concept

1.5.1 Programs in the European academic eco system.

In the European academic world, many study programs in the field of entrepreneurship are already existing and the creation of new programs is heavily supported by the European Commission (European Commission, 2016). Students can choose from a total of 261 Bachelors Degrees¹⁵ and 736 Masters degrees related to entrepreneurship available in Europe¹⁶. In the following, a couple of successful entrepreneurship programs in the European academia are illustrated. The programs have been chosen by recommendation in relevant papers in the field (European Commission) (Gibcus, et al., 2012).

1.5.1.1 Finland

The first example for entrepreneurial programs can be found in Jvaskyla, Finland. It is indeed a ground-breaking model in the field of entrepreneurship education, the founder, Johannes Partanen, was nominated for Counselor of Education in 2010 for his work. The quality of the teachers can be proven by the fact that World CSR Day recently chose the Head Coach, Ms. Ulla Luukas, as one of world's 50 most influential leaders. The so-called Team Academy is since the start in 1993 a part of Jyväskylä University of Applied Sciences, in detail it is defined as the Entrepreneurship Center of Excellence. The University has built an own campus for this Center of Excellence, which has capacity for 180 young entrepreneurs. The very practical study program lasts three and a half years and leads to a Bachelor of Business Administration degree. The structure of the program is as follows: five full-time coaches are working with the 180 students in the program. The teachers, which are called Team Academy coaches have a business degree, business-related work experience, and have completed the pedagogical studies required of all University of Applied Sciences teachers in Finland. The instruction method is focused on a very practical way, which includes a high degree of team-work and thereby learning with and from peers. This "learning by doing" is achieved by teams of ten to 20 students which are formed at the beginning of the program and work throughout the program as independent cooperatives. The Team Academy philosophy is teaching business through running a business. Their model

15 Compare <http://www.bachelorsportal.eu/search/#q=di-86|lv-bachelor,preparation|!dg-premaster&order=relevance>

16 Compare <http://www.mastersportal.eu/search/#q=kw-Entrepreneurship|lv-master,preparation|!dg-prebachelor|rg-1&order=relevance>.

shows the strong belief that entrepreneurship cannot be purely taught theoretically but must always be connected with practical and individual experience. The model of the Team Academy completely different from conventional teaching and learning approaches:

- *No students but team entrepreneurs,*
- *No classrooms but an open plan office,*
- *No teaching but learning,*
- *No teachers but coaches,*
- *No simulations but real business, and*
- *No control but self-organizing* (Gibcus, et al., 2012).

In this case, the approach is not to implement practical tasks into the theory but much rather bringing theoretic readings in the form of business-related books into the overall practical course of the program. Theoretic topics include leadership, marketing, creativity, and innovation, entrepreneurship and personal growth. At the end of the program, an academic thesis is written by the students.

1.5.1.2 Ireland

At Dublin Institute of Technology, the entrepreneurship program “Social Entrepreneurship and the Student” contains a project where students organize a charity event instead of absolving an exam. The students have complete freedom in the organization and planning as well as overall scale of the event, they are supposed to work completely autonomously. Within three months the students have to

- 1. identify a charity that they wish to support;*
- 2. generate and select an idea for a charity event;*
- 3. secure a suitable venue;*
- 4. get sponsors for the event;*
- 5. develop and implement a marketing strategy;*
- 6. sell tickets for the event;*
- 7. organise every element of the operations;*
- 8. determine the budget for the event and manage the finances;*
- 9. review the success of the event;*
- 10. write a report individually on their learning experiences.* (Gibcus, et al., 2012).

The list of activities shows that the organization and implementation of the event is including most aspects of running a business. This highly practical approach is unique in the Irish academic world, during the preparation of the events, no traditional classes are held, classes are rather workshops to support the project. This practice enables students to bring in and make use of knowledge acquired in other business subjects in this course and students with different sets of skills and abilities have the chance to showcase their motivation, commitment and organisational skills. The project is relatively young, it has been established two years ago, but thanks to the good results and the good course evaluations of the students, the project can be seen as a big success. This entrepreneurial approach apparently motivated students highly, students feel that they are learning much more effectively, plus they greatly appreciate the opportunity to do a real world project. Students have also appreciated the social aspect of the project very much, besides they were surprised of the variety of ways in which entrepreneurial skills could be applied. All in all, the demand among students for the course is steadily increasing since its establishment (Gibcus, et al., 2012).

1.5.1.3 Austria

At the Johannes Kepler University of Linz, entrepreneurship mindset is fostered and skills are learned in an own Innovation Lab. It combines students from different academic disciplines, who are working together in mixed teams of both entrepreneurs and engineers. The innovation lab aims at investigating in the feasibility for technical innovation in an academic context.

Courses in the engineering as well as business faculties provide a program offer which stresses the entire product development process both from the manager's and the engineer's point of view. The procedure within the innovation lab is typically the following: a technical product idea is generated, the idea is elaborated in regards to market and business potential and the prototype is created (Gibcus, et al., 2012). Three modules, which are courses of the duration one semester, build up the Innovation Lab:

	Module 1	Module 2	Module 3
Engineering	Develop innovative technical product ideas	Analysis of business ideas. Engineering students involved into coursework Market analysis, field research and calculations.	Optional: students can use technical infrastructure and receive funds from academic incubator to construct first prototype
Entrepreneurship	Evaluate idea from entrepreneurial point of view	Credits for both faculties	
Outcome	Technically and entrepreneurially developed business idea, forecast of profitability potential -> business plan		First prototype

Table 1: Innovation Lab Module structure (Gibcus, et al., 2012)¹⁷

1.5.1.4 Germany

The Technical University of Munich is a pioneer in the field of entrepreneurship in higher education. Not only by calling itself the “Entrepreneurial University”, also by providing an entrepreneurial setting, entrepreneurial thinking and acting among students is supported and empowered. The University has an interdisciplinary profile of sciences, engineering, medicine, and life & food sciences, where a great variety of research and education are offered.

At the location Munich, there are two central institutions for entrepreneurship education both on a scientific and an applied level: the KfW Endowed Chair in Entrepreneurial Finance and the UnternehmerTUM. This is a further point which provides for an entrepreneurial setting by offering trainings and the opportunity to get a deeper understanding of entrepreneurial topics for business, science, engineering and medical students. The two institutions complement themselves with the scientific background and practical approaches. Both offer a number of diverse lectures, seminars

¹⁷ Own illustration.

and hands-on approaches for students from all faculties to engage in the topic of entrepreneurship. A special focus is placed on interdisciplinary training, and students from all faculties are encouraged to join the courses and work in interdisciplinary teams.

KfW	UnternehmerTUM
Scientific basis of entrepreneurship <ul style="list-style-type: none"> • Exemplary seminar topics: “Social Entrepreneurship”, “Recent Developments in Private Equity and Venture Capital Markets”, “Financing and Valuation in the Biotechnology and Pharma Industry” or “Private Equity Funds and their Portfolio Companies” • Case study seminars to train problem solving skills & creativity • Project study 	<ul style="list-style-type: none"> • Business plan seminars for students and researcher, interdisciplinary teams • Innovative Entrepreneurs lecture • Extracurricular scholarship “Manage&More”

Table 2: *UnternehmerTUM & KfW Programmes (Gibcus, et al., 2012)*¹⁸

1.5.2 Why are especially these programs successful?

Experts have identified the success factors for entrepreneurship education as follows:

As an external framework condition it can be defined that entrepreneurship has to be spread across the curriculum and to be reached by students from different disciplines. The framework conditions to ensure the effective integration of entrepreneurship can be positively influenced by public policies. When it comes to institutions of higher education, two key success factors have been identified: the partial replacement of traditional by a more balanced way of teaching with a high degree of learning-by-doing. The shift of the classic University model into an “entrepreneurial university”, which is represented by an omnipresent entrepreneurial mindset in the entire institution. A number of universities and colleges are fostering a

¹⁸ Own illustration.

shift towards this approach, but the ones illustrated above are clearly a step ahead (European Commission).

In the following paragraphs, the author will demonstrate the impact of different entrepreneurship programs on the mind-set and capabilities of alumni in respect to entrepreneurship. The direct comparison between former students of entrepreneurship programmes at Universities vs. former Junior Entrepreneurs of the JADE network vs. a control group of other students. This comparison has been done for the study by the European Commission (Gibcus, et al., 2012) and the results are presented in a short summary to illustrate the implications of entrepreneurship education on alumni. It can easily be seen that students who have been in touch with entrepreneurial education have a shifted mind-set for both, a more entrepreneurial self-perception towards and openness to an entrepreneurial future and career goals.

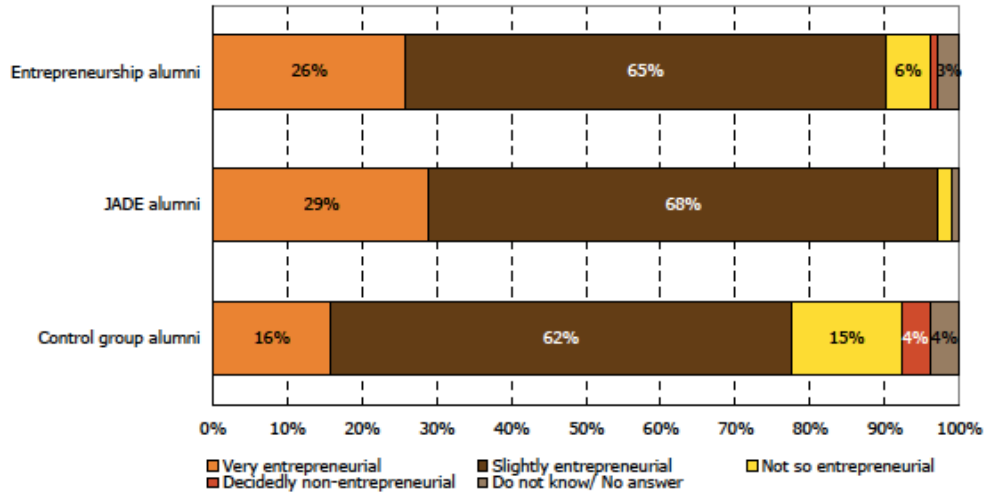
1.5.3 Entrepreneurial self-perception

First, the entrepreneurial self-perception has been investigated: alumni have been asked to what extent they consider themselves entrepreneurial persons. Where the entrepreneurial characteristics have been defined as having the ability to turn ideas into action, including creativity, innovation and risk-taking as well as having a strong sense of initiative and tolerance to failure. Several statements were used in order to measure the self-perception. The clustered score on the following four statements has been taken:

- I am ready to do anything to become an entrepreneur;
- My professional goal is to become an entrepreneur;
- I have no intention of ever starting a firm;
- I am not entrepreneurial.

According to the study, alumni of the entrepreneurial group(s) consider themselves much more an entrepreneurial person than alumni of the control group (compare Figure 8). 90% of the entrepreneurship alumni consider themselves slightly or very entrepreneurial. On the other hand, only three quarter of the control group alumni consider themselves a slightly or very entrepreneurial person. Male alumni consider themselves more as an entrepreneurial person than female alumni. There are no significant age differences.

Figure 20 Entrepreneurial self-perception by group (n=2,582)



Source: EIM, 2011.

Figure 8: Entrepreneurial self-perception (Gibcus, et al., 2012)

1.5.4 Desire for transition

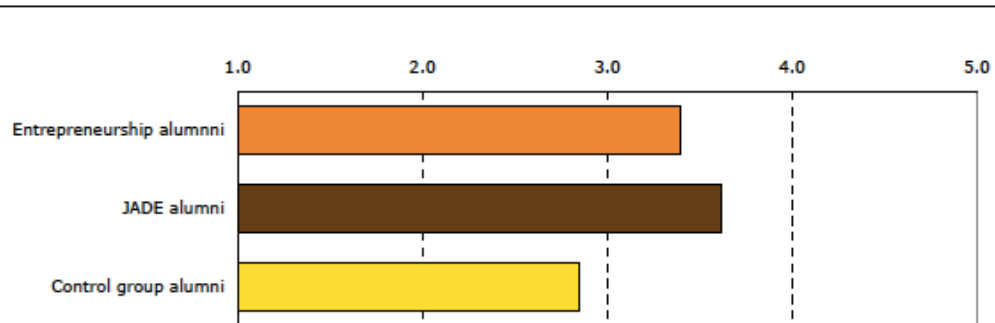
Another measured factor is the desire for a transition towards entrepreneurship of entrepreneurship alumni in comparison to control group alumni (Figure 9). The clustered score on the following four statements has been taken as a measure:

- A career as an entrepreneur seems attractive to me;
- I think that entrepreneurship would provide great satisfaction;
- Among various options, I’d rather be an entrepreneur;
- I am negative towards entrepreneurship.

The clustered score for these four statements shows that entrepreneurship alumni have a stronger desire for a transition towards entrepreneurship than control group alumni (Figure 10). On average they are less negative towards entrepreneurship, they have a stronger desire to be an entrepreneur among various options, they think more often that entrepreneurship will give them great satisfaction and they see more often the attractiveness of a career as an entrepreneur. JADE alumni have an even stronger desire for a transition towards entrepreneurship than entrepreneurship alumni.

Furthermore, male alumni outscore female alumni. There are no significant age differences.

Figure 21 Intentions towards entrepreneurship by group, construct 1 (n=2,582)*

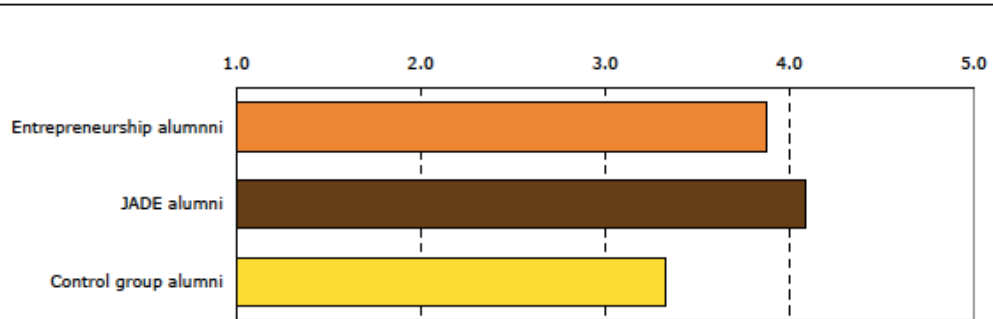


* Scale: 1 (does not apply) – 5 (strongly applies); results are significant at 1% level.

Source: EIM, 2011.

Figure 9: Intentions towards entrepreneurship by group, structure 1 (Gibcus, et al., 2012)

Figure 22 Intentions towards entrepreneurship by group structure 2 (n=2,582)*



* Scale: 1 (does not apply) – 5 (strongly applies); results are significant at 1% level.

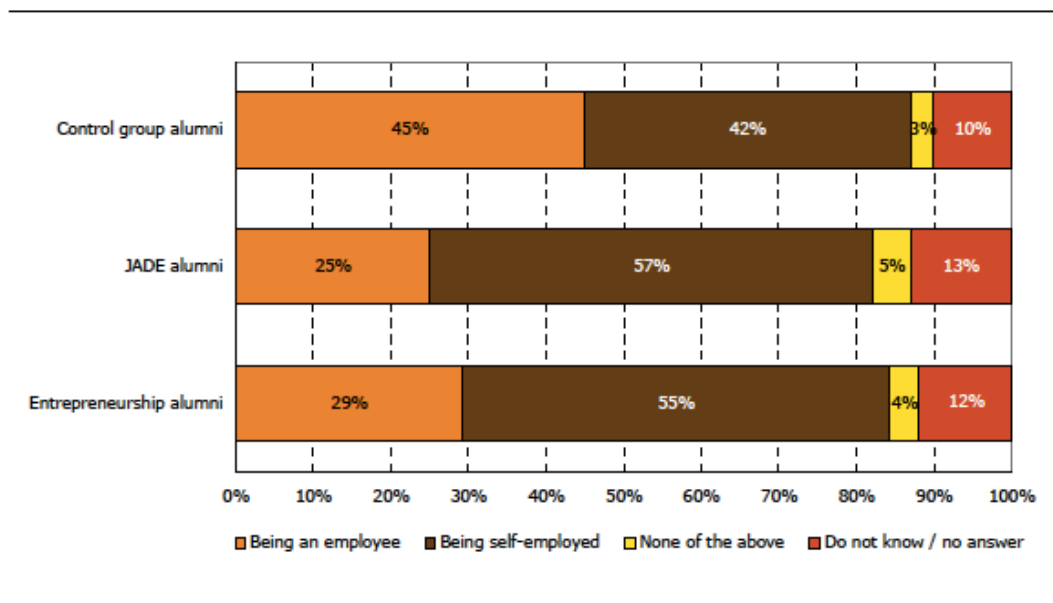
Source: EIM, 2011.

Figure 10: Intentions towards entrepreneurship by group, structure 2 (Gibcus, et al., 2012)

1.5.5 Intentions towards entrepreneurship: employment preference

Another way to indicate alumni's intentions towards entrepreneurship is their employment preference: given the choice, would the preference be to be an employee, be self-employed or none of these? Similar to the previous characteristics, there is a significant difference between the employment preferences of the entrepreneurial groups and the control group (Figure 23). More than 50% of the entrepreneurial group(s) alumni would rather like to be self-employed at this moment, whereas for the control group only 42% of the alumni share this preference. Simultaneously, less than 30% of the alumni of entrepreneurial groups alumni prefer being an employee, whereas almost half of the control group would prefer to be an employee.

Figure 23 Employment preference by group (n= 2,582)



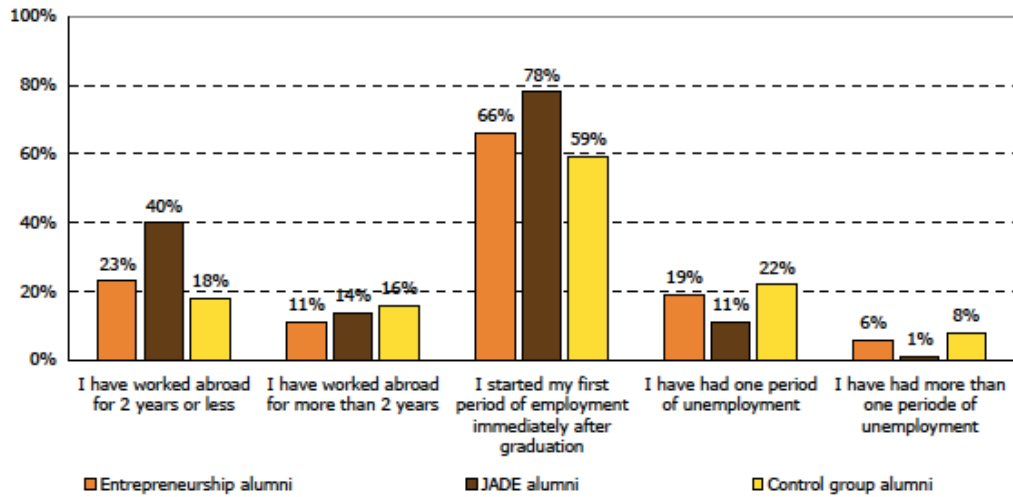
Source: EIM, 2011.

Figure 11: Employment preference by group (Gibcus, et al., 2012)

By acquiring the key competences of an entrepreneur, as defined in chapter 1.2, the employability of students is naturally expected to be increased. Employability contains not only the capability to find a first job, but also to maintain a job and find a new job in paid and/or in self-employment. The extent of employability can be measured considering a variety of aspects. In the study “Effects and impact of entrepreneurship programmes in higher education” (Gibcus, et al., 2012) the focus has

been on job experience, job satisfaction, annual income and involvement in business start up of the alumni who are in paid employment.

Figure 27 Job experience of alumni currently in paid employment (n=1,899)



Source: EIM, 2011.

Figure 12: Job experience of alumni currently in paid employment (Gibcus, et al., 2012)

All in all, it can be seen that entrepreneurship study programmes are not the only way of producing highly skilled students with an entrepreneurial mind-set. The concept of JEs is a valid alternative, which has been proven by the quoted study of the European Commission. Even the Forbes magazine gives five reasons why curricular entrepreneurship programs are not necessarily the best initiative (forbes, 2013):

Academic entrepreneurship programs are almost always part of the business school, students with other backgrounds or interests are not being attracted by those programs – subsequently no variety in entrepreneurs graduating from these programs. Professors are often far away from the entrepreneurial reality; thus their teaching is too academic and does not foster a real entrepreneurial spirit among the students. Business cases studied/ ideas initiated are mainly related to the university and not independently implementable in the real world/ not solving a real world problem. The standard academic grading system is not the correct evaluation method for creative minds like entrepreneurs are – does not represent the quality of a students work and therefore should not be applied. Hardly any incentives are given for students to step out and

really launch their business – a big part of the ideas are dying with the end of the course (forbes, 2013).

All these criticisms of academic entrepreneurship programs can be opposed with the JE concept, which is on a European level represented by JADE and explained in more detail in *2 JEs, JADE & the European Network*.

In this chapter, a broad research of literature about the forms and contents of entrepreneurship education and its importance has been presented. Entrepreneurial competences have been analysed and thanks to a study by the European Commission among entrepreneurship alumni, entrepreneurial propensity and intentions of those alumni compared to a control group of other alumni could be understood. It has been found out that students either from an academic entrepreneur program on extra-curricular activity like a Junior Enterprise are significantly more entrepreneurially oriented than other students. Further analyses of the existing academic literature about entrepreneurship education brought the conclusion, that entrepreneurship education is not only important in terms of entrepreneurial skills development and capacity building but also for creating awareness and fomenting the ability of spotting business opportunities and the pursuing opportunity beliefs.

2 JEs, JADE & the European Network

2.1 What is a JE?

A **JE** is a non-profit civil social organization, formed and managed exclusively by undergraduate and postgraduate students of higher education, which provides services for companies, institutions and society, under the guidance of teachers and professionals with the goal to consolidate and enhance the learning of their members. JEs are similar to real companies, counting with the principles of corporate governance like management council and executive board, and own regulations.¹⁹

The objectives of a JE are the following:

- Providing a “*learning by doing*” experience for students, who create and manage their own non-profit SMEs offering various services to the market, in relation to their field of study
- Connecting *academic knowledge and the business world*, allowing students to add practical experience to their theoretical skills
- *Fostering entrepreneurial skills*, needed in modern economies and societies, such as self-confidence and direct entrepreneurship experience
- *Enhancing employability* in a local market, helping local companies to search for and employ talented, experienced and motivated students from one single place
- *Improving local economic and social growth*: Junior Entrepreneurs are a direct way to promote universities’ brands to local companies²⁰

2.2 What do JEs work on?

JEs work on a number of different projects, ranging from consultancy services to translation, from Minimum Viable Product development to coding for website and mobile applications. In the following paragraph, some examples of innovative projects conducted by the JEs in Europe can be seen as examples of the disruptive character of the JE Movement.

21% of former Junior Entrepreneurs start their own company within 3 years after graduation (EU average: 4-8%): JEs are an essential motor for disruptive innovation and economic growth

¹⁹ JADE information material.

²⁰ JADE information material.

Activity fields of Junior Enterprises

Analysis around the site and study path

Name of JE: ENVOL Junior-Etudes

Client: CCI de Haute Corse

Country: France

Outline: To help the Calvi Sainte Catherine platform to simplify its landing procedures, ENVOL has made a trajectory analysis around the area. This data helped completing a file for the Civil Aviation Direction. They started with an analysis of the current operational situation and then a study of the landing procedures via a landing simulation for Pilots. Finishing with a modelling of the averaged trajectory and the obtainment of a new certification for the Aerodrome and an opportunity for the students to get used to this type of procedures. The project is the winner of the French national award “Label ingénieur 2015”²¹

Mobile app development

Name of JE: Junior ISEP

Client: Smartphood SAS

Country: France

Outline: Through the creation of two Apps (one for the customers to order and one for the delivering services followed in real time) habitants from Paris can order high quality foodboxes in all the city and follow the track of their meal. This project permitted the creation of a new enterprise and the app is available on iOS and Android. The project is the winner of the French national award “Label ingénieur 2014”.²²

Creation of an administrative software

Name of JE: Junior ISEP

Client: Internally developed project

Country: France

Outline: Creation of a software to manage a construction site and manage all electrical infrastructure while optimising the needed electric wiring. The graphical interface must show the positioning of the machines on the site. There are two modules,

²¹ JADE information material.

²² JADE information material.

first one is admin mode and second one is optimising mode. The project was made in collaboration with the client so it would meet his needs as much as possible and was redesigned multiple times. The project is the winner of the French national award “Label ingénieur 2013”²³

Organization of biggest Italian event on Wearable technologies

Name of JE: JEToP

Client: Internally developed project

Country: Italy

Outline: WTT is the first Italian exhibition entirely dedicated to wearable technology. Wearable devices are 24H companions; sports, health and entertainment are just few of the fields in which this new life-changing technology can enhance and simplify our lives. User experience is crucial thus the objective is to make the public interact with devices, experiencing various situations to understand their true potential. Conferences and debates will give the public an idea of what will happen in the coming years. Wearables, as a new-born technology, are just at the beginning! The second objective is to give the chance to the participating companies to create a network, through exclusive B2B moments. WTT is preceded by a Hackathon, a 48h marathon dedicated to developers, to create ideas for new devices and applications. Microsoft and Arduino, as official partners, supply the hardware and guide the participants.²⁴

Start-up Weekend Benevento

Name of JE: JEBS

Client: Internally developed project

Country: Italy

Outline: The Start-up Weekend is a non-profit business competition supported by the Kauffman Foundation and Google for Entrepreneurs. The event, lasting 54 hours, involves the transformation of a business idea into a concrete project that will eventually be exposed to a jury of industry experts and investors.

The event is the largest initiative in the world for the development of new business ideas and holds the record for the field training and team building. It is

²³ JADE information material.

²⁴ JADE information material

therefore a unique opportunity to practice their skills and acquire new ones, meet new people, to network with startupper and investors. Start-up Weekend Benevento had a more noble and ambitious goal: to promote and disseminate the entrepreneurial spirit in a region, the South, characterized by a strong static and cultural backwardness.²⁵

2.3 What is JADE?

JADE – the **European Confederation of JEs** – is an international, non-profit umbrella-organisation of JEs. The network is currently composed of 14 Confederations and Consultative Members from Europe, summing up to almost 300 JEs in the top universities in Europe, for a total of over 22,000 Junior Entrepreneurs and a cumulated turnover of 16 million € per year (JADE, 2016).

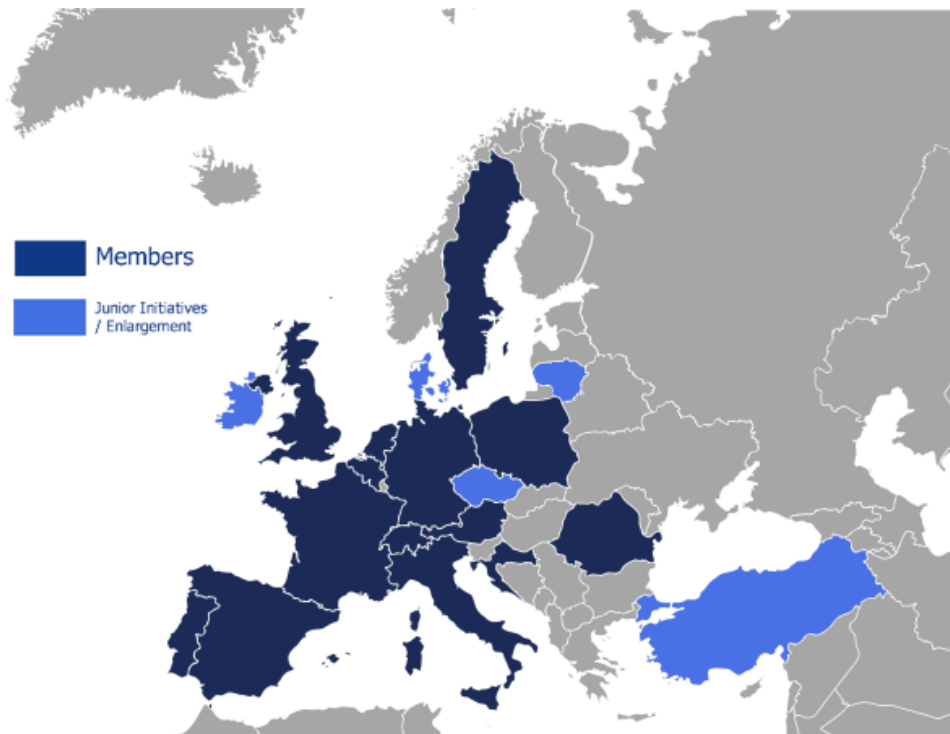


Figure 13: JADE Member countries²⁶

²⁵ JADE information material

²⁶ JADE information material.

As the organization representing the JEs at European level, its mission is: “To be the voice of the European JE Movement, representing, integrating, and supporting the Network, through the spread of youth entrepreneurship.” (JADE, 2016).

2.3.1 JADE Structure

JADE can be defined as a bottom-up organization: at the base of the organization pyramid there are the Junior Entrepreneurs, who choose in turn the leaders of their JEs to represent and guide the organization, manage the relationship with clients and suppliers, partners and in general all the external stakeholders. At national level, the JEs elect their country representatives, who work in the national confederations to promote the JE concept and answer the needs of their JEs at country level. Each country elects its International Manager, the person responsible to keep contacts and ensure effective communication between the national and the European level, JADE. Finally, all the national representatives, gathered in the General Assembly, elect the JADE Executive Board, which, living and working in Brussels, represents the movement at European level and keeps the relationship with the partners, institutions, and the other confederations in the world.²⁷

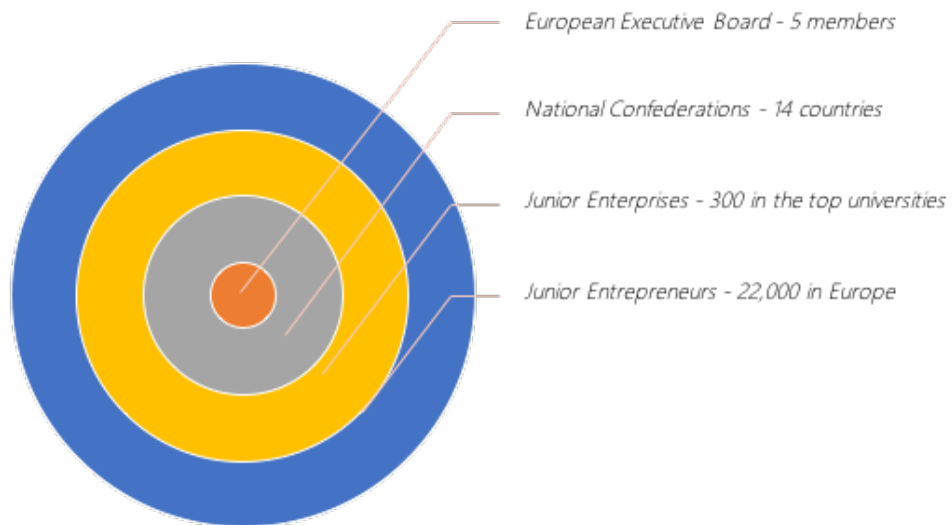


Figure 14: Bottom-up structure of the Organization²⁸

²⁷ internal JADE material.

²⁸ internal JADE material.

2.3.2 JADE History

The JE movement appeared in France in 1967, with the foundation of the first JE at the ESSEC Business School, in Paris. The concept spread soon both in France and beyond the national boarder: The Confédération Nationale des Junior-Entreprises, CNJE, was founded in 1969, and between the 70s and the 80s the concept moved around Europe. In 1992 in six countries JEs were federated already in national Confederations, and decided to take a step forward in the creation of a larger scale movement: JADE (Junior Association for the Development in Europe) was created with the aim of fostering at European level the JE concept and help promote the creation of new JEs around the continent.

2.3.3 JADE Activities

Being the European Confederation of JEs, JADE carries out several activities on European level, that can be clustered as follows:

- **JADE Events:** bringing the network together. JADE organizes two major events per year, the first in March in Brussels (JADE Spring Conference) and the second during the summer, around Europe (Summer JADE Conference), with around 300 participants per event and over 20 nationalities represented. In these occasions, the network gathers to exchange knowledge and best practices and are supported by both partner institutions and companies that also share their perspective on the issue at stake. The gem stone of International events, JE World Conference, is held every two years – alternatively in Europe or in Brazil – bringing together Junior Entrepreneurs from all around the world to foster the JE global movement.
- Furthermore, JADE organizes each year Generations Club, an event aimed at bringing together representatives from the major European youth organizations as well as representatives of the policy making area, experienced professionals and accomplished entrepreneurs, to better understand the youth's perspective and learn from each other. In 2016, seven networks representing more than several millions of young people were invited to discover the value of entrepreneurial skills at the Microsoft Innovation Centre Brussels. At their aid guests from both public and private sector, rounding up seniors from Nike, Adecco and Microsoft, but also from Universities and the European

Commission DGs and the OECD, drove the discussions into creating a European report on the Youth's Perspective on Entrepreneurial skills and formal, non-formal and informal ways of learning these.

- Positioning and White Papers: lobbying for young people. JADE works to foster the JE movement and make it possible for a steadily increasing number of students to put their ideas in practice. To reach this goal, JADE is aiming at positioning the JE concept as a best practice in entrepreneurship and in entrepreneurial education, by writing position papers and influencing reports from relevant institutions²⁹
- Fostering skill acquisition and knowledge sharing. JADE's members master cutting edge processes and techniques, are able to access state of art knowledge in the fields in which they want to foster change: this is why JADE is providing its members with dedicated trainings as well as education opportunities around Europe. On one hand, it is ensured that high-quality workshops during the own events are offered, held either by corporate partners or by own members, to encourage knowledge sharing. Also, by collaborating with high-level education institutions such as EUIL and Microsoft, with which JADE has signed in 2014 the "Educational Transformation Agreement", JADE is striving to ensure the best opportunities to the Junior Entrepreneurs.
- Representing the movement in high-profile events.

JADE representatives are often invited to speak on the behalf of our Junior Entrepreneurs about the JE movement and to showcase the concept, positioned as experts in student entrepreneurship. The aim is to present the JEs as the real bridge between universities and the labour market. In the last year, we participated as speakers or moderatos in several events³⁰.

29 "Facilitate the development of JEs" is a key priority for *Education and Youth Framework of EU2020*

30 "What works: Entrepreneurship in higher Education" by OECD, Helsinki, Finland

"Meet the Experts Sessions on Entrepreneurial skills", European Business Summit, Brussels, Belgium

69 CYFI Final pitch event and launch of the "YE! Platform", Brussels, Belgium

- JADE is recognized as a best practice that brings universities and businesses together under *EU Oslo Agenda for Entrepreneurship Education*
- JADE is in the Steering Board of *UNESCO Youth Committee for Higher Education* and a stakeholder consultant for the *World Bank*
- JADE is quoted as best practice in “Effects and impact of entrepreneurship programmes in higher education”, study by the *European Commission*, 2012
- JADE is quoted in the paper from the *OECD* “OECD Higher Education Programme “What Works” Conference: Entrepreneurship and Higher Education” as an example of best practices, 2012. JADE is quoted as a mean to increase economic and social impact in the *European Commission* report “Entrepreneurship Education: a road to success”, 2015
- “Youth entrepreneurship: prospects for EU”, by Commission Vice-President Katainen cabinet, Brussels, Belgium

“Thematic University-Business Forum”, Berlin, Germany by European Commission

Concertation Meeting - DG Connect, Brussels, Belgium

“6th University-Business Forum”, Brussels, Belgium

“PILC 2015: Change Leadership - Key to Successful Growth”, Croatia, by PAR University

“Solutions to Youth Employment - A Partnership between Governments, Private Sector and Civil Society” - Brussels, Belgium, World Bank

“SME Envoys” - Milano, Italy, European Commission

“European Development Days” - Brussels, Belgium, European Commission

“Informal Forum International Students Organisations” - Budapest, Hungary

“International ProAktivity Summit 2015” - Brussels, Belgium by YouthProAktiv

“Young people and entrepreneurship: how to bridge the gap?” - European Policy Centre

JADE partnered for the Microsoft’s European AppCup - <http://www.appcup.eu>

2.4 JADE as facilitator on European Level

JADE plays an important role for JEs on a European level in order to connect them to the European Institutions and opportunities facilitated by these. Learning mobility among young people is highly promoted and supported by the ERASMUS+ programme and its predecessors (Youth in Action programme and Lifelong Learning programme, particularly Erasmus and Comenius) funded by the European Commission and spread effectively in more than half the member states. The program is steadily developing, which is why the tools for promotion of learning mobility for young people are increasing significantly since 2010. The ERASMUS+ programme is a programme for education, training, youth and sport and is valid from 2014-2020. Its purpose is to foster skills development and employability, as well as to modernise education, training and youth work.

The program aimed at 4 million Europeans foresees a duration of seven years and total investments of € 14.7 billion; which entails a 40 % increase compared to previous investment (ERASMUS+, 2016). This represents the EU's commitment to an active improvement in these areas. It enables students to study, train, gain work experience and volunteer abroad. International partnerships and collaborations in the fields of education, training, and youth institutions and organisations are fostered by the program in order to bridge the gap between the worlds of education and work. This is achieved tackling the skills gaps Europe is currently facing (ERASMUS+, 2016).

The Erasmus+ programme is divided into three Key Action fields:

- *Key Action 1: mobility for young people and youth workers. Young people have the opportunity to participate in youth exchanges or to volunteer for a period of up to one year in another country under the European Voluntary Service scheme. Youth workers can take part in training and networking activities abroad or spend some time in a youth organisation for job shadowing or a period of observation.*
- *Key Action 2: cooperation for innovation and exchange of good practices. Organisations can apply for funding to work in partnership with organisations from other participating countries. The projects funded under this action will focus on sharing, developing and transferring innovative practices in education, training and youth provision between participating countries.*

- *Key Action 3: support for policy reform. The Erasmus+ programme will fund strategic activities supporting policy reform across the EU. Funding opportunities under this key action may extend to meetings between young people and decision-makers or support the implementation of Structured Dialogue (ERASMUS+, 2016).*

JADE Activities fall into all of the three pillars and therefore help to achieve the goals of the European Commission in regards to student mobility and skills development of Europeans.

However, the JE concept is not limited to Europe: thanks to the passion and the efforts of its members, it reached Brazil in 1988: it had a huge success in the country, that is now the home of JADE's sister confederation Brasil Jùnior. Today, Brasil Jùnior counts almost 20,000 Junior Entrepreneurs in the Country who work to develop their skills and abilities in order to become better workers and better citizens. Brazil Junior and JADE began working together, organizing the first JE World Conference in 2004. In 2016 the JEWG was organized for the sixth time. It was held in Florianopolis, Brazil, with 3200 participants from all around the world. The Global Council of JEs has been created and a strategy with a clear vision by 2018 was defined: "Becoming a truly connected network by improving results". The vision is to be reached by working on three strategic pillars and 10 main projects whose success is measured by pre-defined KPIs. In fact, JADE and Brasil Junior are not the only confederations at global level: in 2013 JET – Junior Enterprises of Tunisia - was founded: it now counts around 40 JEs in the country and keeps expanding. In 2015, the Canadian Confederation of JEs (JC3) was created as first in north America. Under a global cooperation agreement, the confederations keep bringing the movement forward in order to reach new countries and continents: today, with the first JEs in the USA, China, Malaysia and Morocco and new Junior Initiatives in Turkey, Russia and Australia, the JE movement can truly define itself as global, and enlarging its boundaries.

2.5 The census & Identity study as base for this research

In this paragraph, the census and identity programme as a background for the present thesis is presented. Census & Identity is a programme with the following two main purposes: to provide JADE and its sister organization Brasil Júnior with the information necessary to lobby internationally for the recognition of the JE concept and to provide JADE with information required to execute its projects and processes more efficiently and tailored to the needs of the confederations. The survey was sent to the International Managers of each National Confederation from Europe. However, the results of the census study were not as good as expected as many International Managers did not have the information needed to answer those questions because a lot of information is considered confidential by their organisational culture. The identity part of the study got directly answered by Junior Entrepreneurs and JADE has exclusive access to the collected data.

Methodology

To find the best methodology for the survey, it has been decided to contact OECD (Organization for Economic Cooperation and Development). David Halabisky, one of the economists of the Youth Entrepreneurship Department, supported the organization to find the best way to make these surveys. To start with the surveys, the first step was to understand the aims and purposes of the Census & Identity. For that, a brainstorming in the Department of Public Affairs with the aim to draw the guidelines for the project has been conducted. Following the brainstorming, the main objectives for both projects have been concluded:

- a) Sell the JE concept to partners
- b) Adapt JADE's projects to the national confederations' requirements
- c) Have a better understanding of the network data and
- d) Have a communication tool for Public Affairs and Private Cooperation

Thereby, the second step was to gather all the information that are needed the get to these objectives. A complete analysis of the last results of a worldwide Census project was done to understand which kind of data was collected. The Department of Public Affairs selected all information found important for this purpose. A final document with the needed information has been created. Two separate surveys were made: Census and Identity. The census survey is supposed to be filled for the entire

confederation by the International Manager. The identity survey is an individual one which. The aim is to reach about 500 Junior Entrepreneurs in Europe and Tunisia.

Next Steps

The evaluation of the collected data is to be done via a first overview of descriptive statistics about the data set and to be followed up by a correlation analysis in order to investigate correlations between the variables of interest. Subsequently, a regression analysis is done to find an answer to the research question, defined in chapter 3 *Research Method*.

Summarizing, the European Commission has put entrepreneurship education on its agenda as a key priority since the Oslo Agreement in 2006 (European Commission, 2006). Different initiatives are existing on European level and the JE concept is one of them. The concept and work of JADE is largely recognized as a best practice for entrepreneurship in the higher education sector.³¹ Indeed, through a complete learning by doing experience, students already manage a company and provide services to clients with the JE portfolio being embedded with the university curriculum. The Junior Enterprise concept serves not only to prepare students for the job market, to equip them with entrepreneurial thinking and skill but also as a tool for the personal development.

³¹ Compare APPENDIX 1: Support.

3 Research Method

In this chapter, the research method is explained in detail. In specific, the research question, the data collection process and the data analysis method is illustrated. Subsequently the results of the data analysis are interpreted and conclusions about the profile of the Junior Entrepreneur are drawn. In order to define a profile of the European Junior Entrepreneur and his employability and career perspectives in comparison to other students, an online survey has been conducted among students that are member of the European and Tunisian JE networks. The data is analysed in different steps. The first step is a descriptive analysis, followed by correlation analysis (Albareda & Morera, 2014). Finally a multivariate regression analysis is concluded (Stock & Watson, 2011). The model created in the analysis helps to draw conclusions about the Junior Entrepreneurs identity and their future development. In the following paragraph, the background and motivations for the question under research are explained.

3.1 Theoretical development

As explained in chapter 2, It has been decided to study the detailed profile of the Junior Entrepreneur in order to tailor the projects organized by JADE in a perfect way and to support the European JEs in a way that prepares students best for the job market in a globalized world.

The topic of the present thesis “Study of the increased future employability of students working for Junior Enterprises” is leading to one basic question that needs to be answered by analysing the data collected by the online survey: How much is a student’s experience in the JE connected with his or her self-vision of the future. The scenario is modelled by a multinomial probit or logit in which the expectation of future career (employed, self-employed, etc) is a function of the number of projects in JE, of the time spent in JE, of the position held in JE, of the skills obtained in JE and of a series of individual characteristics (educational background, internationalization propensity) and control variables (age, gender, country).

The procedure is the following: first, the data set is analysed by a descriptive analysis and then the correlation between variables of interest shall be investigated and finally a multinomial regression analysis is performed:

- Descriptive statistics
- Correlation analysis
- Multivariate analysis

The data is analysed by a multinomial logit regression executed in STATA.³²

3.2 Sample and data collection

3.2.1 Data set

The sample consists of a data set combined from a survey in French and English language, containing the same questions. In total, 266 Junior Entrepreneurs have answered the questionnaire, out of 420 persons who have received it. The aim of reaching 500 Junior Entrepreneurs was not reached, which was difficult to estimate beforehand due to the internal communication structure. Subsequently a response rate of 63% has been achieved by the survey.³³

3.2.2 Data collection

The survey has been conducted in an online platform, called surveymonkey.com. The link to this online survey has been sent via e-mail to the International Manager of each of JADE's confederations, who then subsequently passed it on to the presidents of their member JEs and these to all the members. The French survey was sent to the French and Tunisian confederations, the English survey to the rest of JADE members. The collected data has been merged from the English and French data sets, cleaned and organized. It was necessary to display all answers which stand for categorical variables as binary variables and keep numerical variables. Only in this way, the data is usable by Excel for the descriptive statistics as well as by the chosen data analysis software STATA. In the following paragraphs, the descriptive analysis as well as graphs for their better illustration are shown.

³² The procedure of data treatment in STATA has been studied autonomously, base materials can be found in *APPENDIX 2: STATA Learning Documents*.

³³ Compare Data set in *APPENDIX 3: Dataset*.

3.2.3 Gender

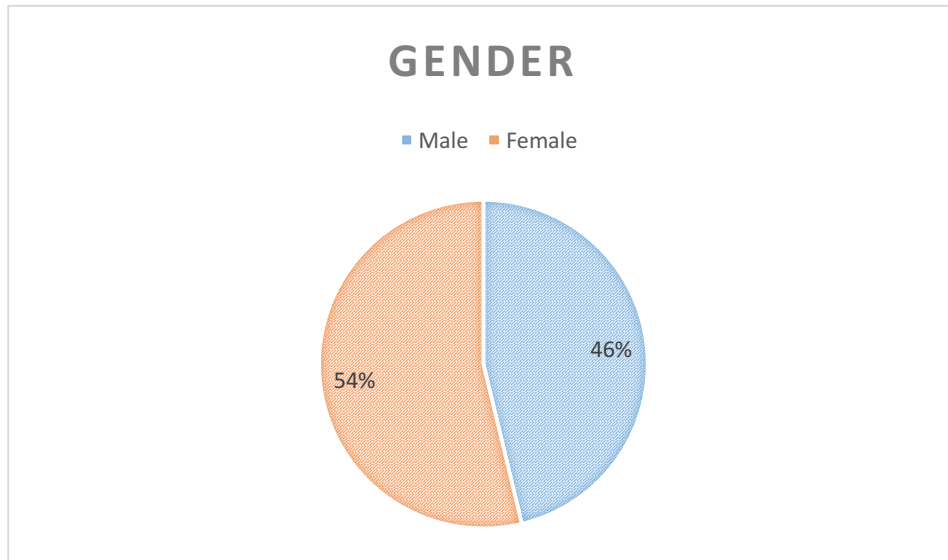


Figure 15: Gender dispersion among sample³⁴

In this graph, the gender dispersion among students of the sample are illustrated. It can be seen that 54% of the audience of the survey were female and 46% male.

³⁴ Own illustration.

3.2.4 Confederation

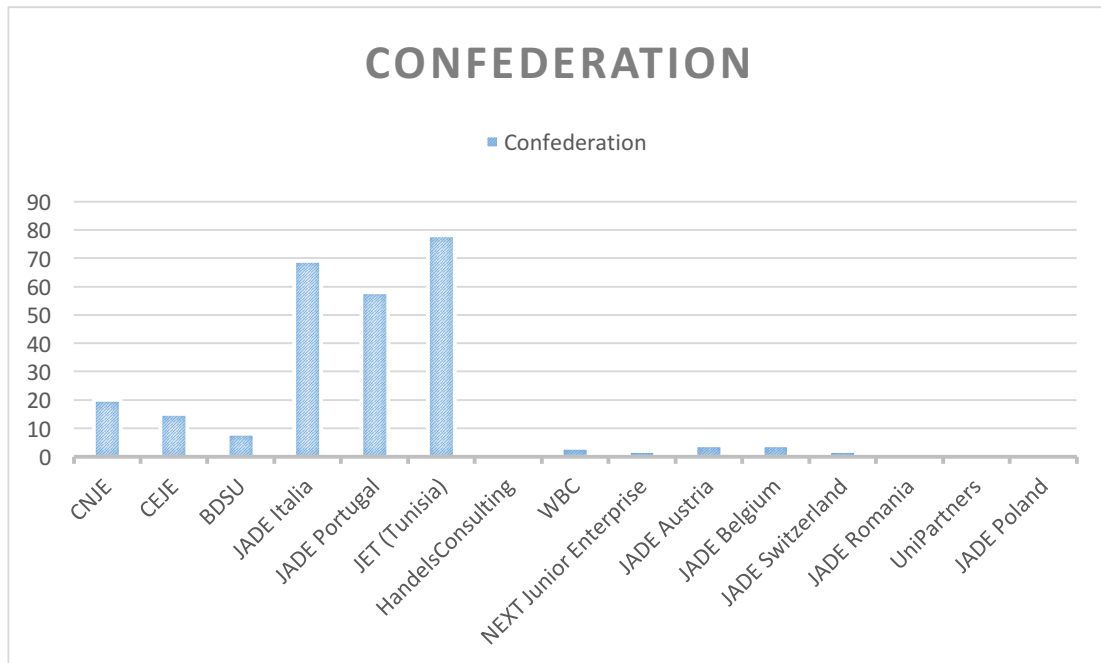


Figure 16: Confederation of Origin³⁵

The graph shows the confederation of origin of the students who answered the survey. That is, it shows in which country the students are active in a Junior Enterprise. In terms of the confederation of origin, most respondents are from Tunisia, Italy and Portugal followed by France (CNJE), Spain (CEJE) and Germany (BDSU). A small number of respondents were from Austria, Belgium, Switzerland and the UK (WBC).

³⁵ Own illustration.

3.2.5 Field of study

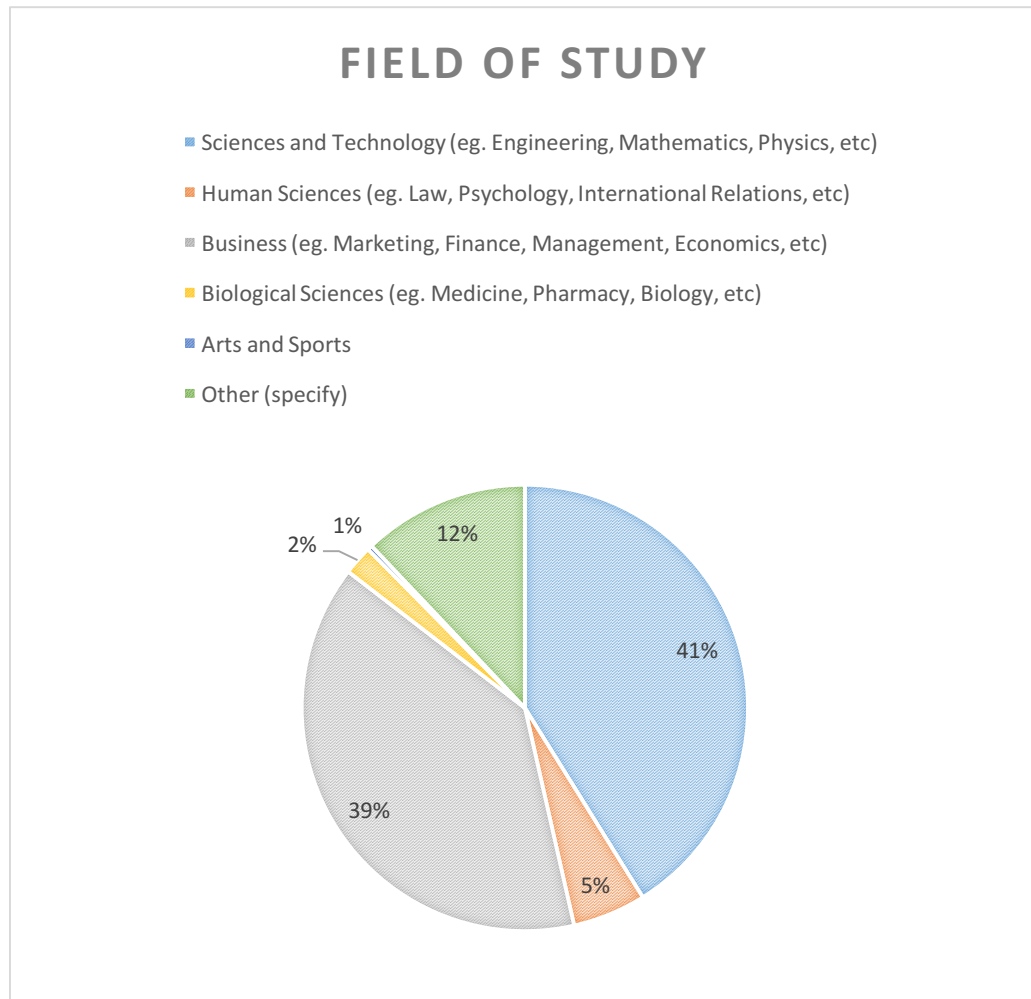


Figure 17: Field of study³⁶

The figure above shows the fields of study of students who took part in the survey. Most of the asked Junior Entrepreneurs are from the field of Sciences and Technology, tightly followed by Business studies. With 5% Human Sciences and a 2% of Biological Sciences and of course 12% other study programmes it can be seen that there is a variance of academic backgrounds among the surveyed students.

³⁶ Own illustration.

3.2.6 Study abroad

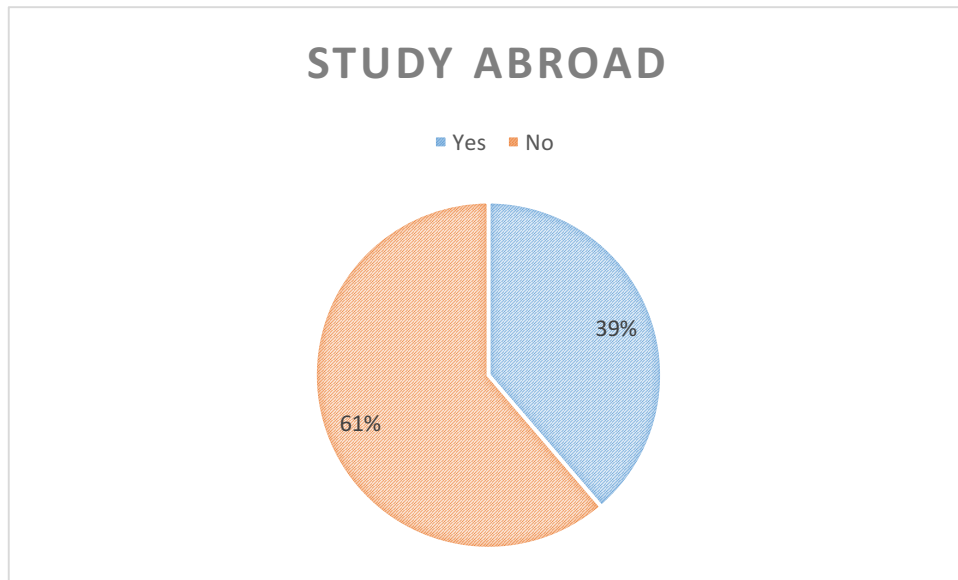


Figure 18: International propensity³⁷

Figure 18 explains the international propensity of students who answered the survey. More than one third of the students taking part in the survey have already absolved a part of their studies abroad, which shows their open-mindedness and curiosity towards other cultures as well as their will to expand their personal networks internationally.

³⁷ Own illustration.

3.2.7 Languages spoken

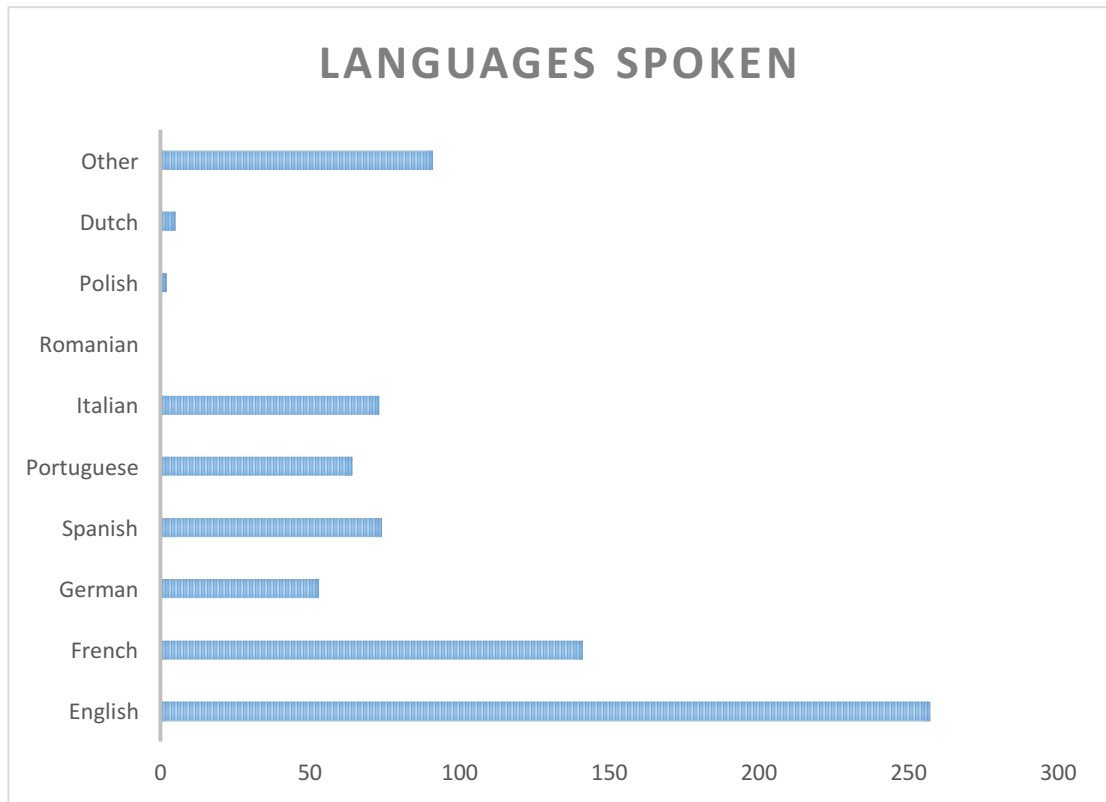


Figure 19: Languages spoken³⁸

This graph explains the languages spoken by the students of the sample. Among the asked Junior Entrepreneurs, almost everyone speaks English and more than half also French. Spanish, Italian, Portuguese and German are also spoken by many students.

³⁸ Own illustration.

3.2.8 Previous Jobs

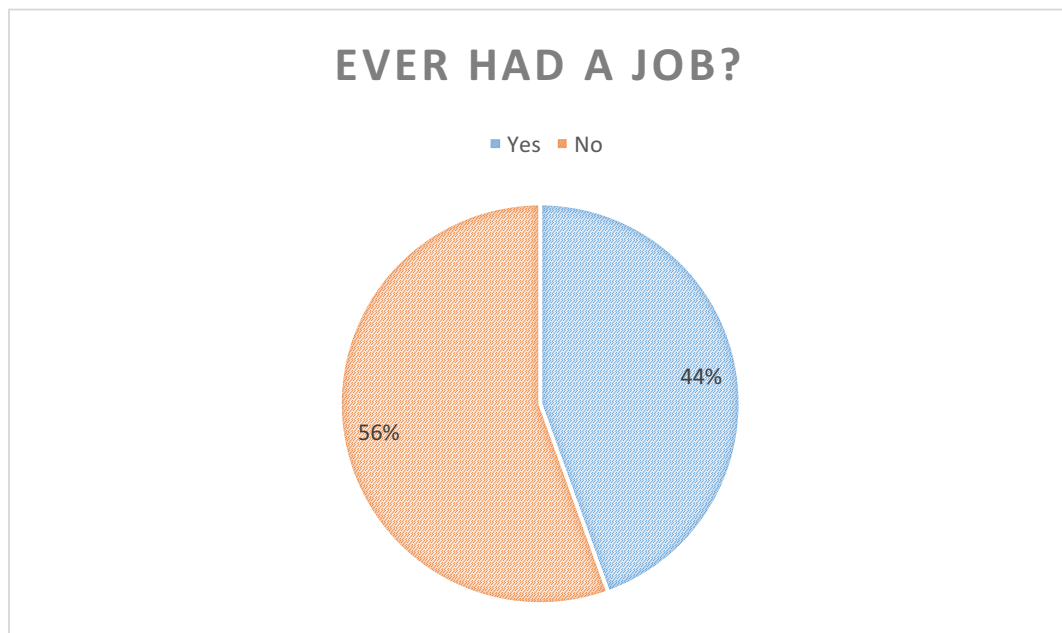


Figure 20: Work experience³⁹

The illustration above shows the percentages of students that have and have not had an employment before. Almost half of the Junior Entrepreneurs of the survey audience have already had a job. The modality of their past job shows that two third have been working part-time and one third full-time.

³⁹ Own illustration.

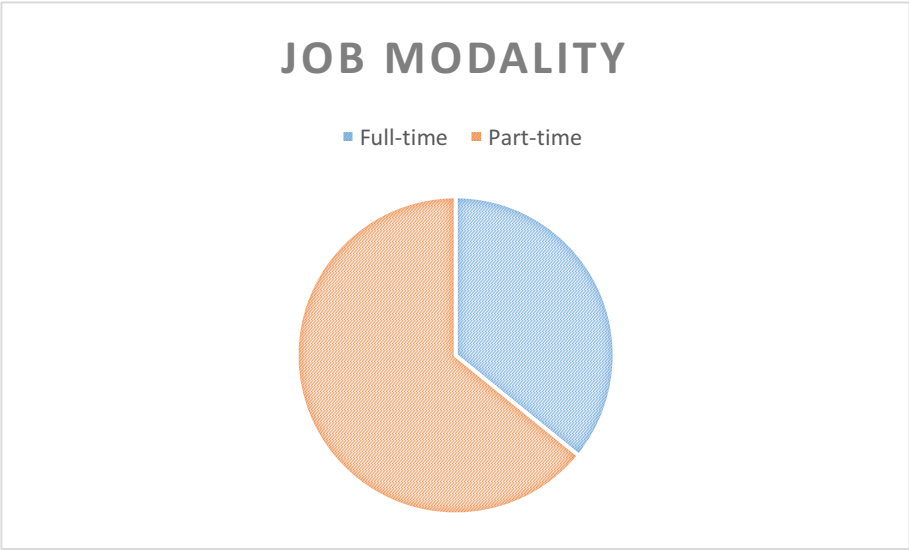


Figure 21: Modality of former job⁴⁰

Here, it is illustrated what kind of job it was, in which the students have been employed. More than half of the students have worked on a part time job. In the next graphic, the activity fields of the students’ jobs are explained. The fields, in which the students have been active is mostly in the private sector, but some have also worked in the public sector, in start-ups and non-profit organizations.

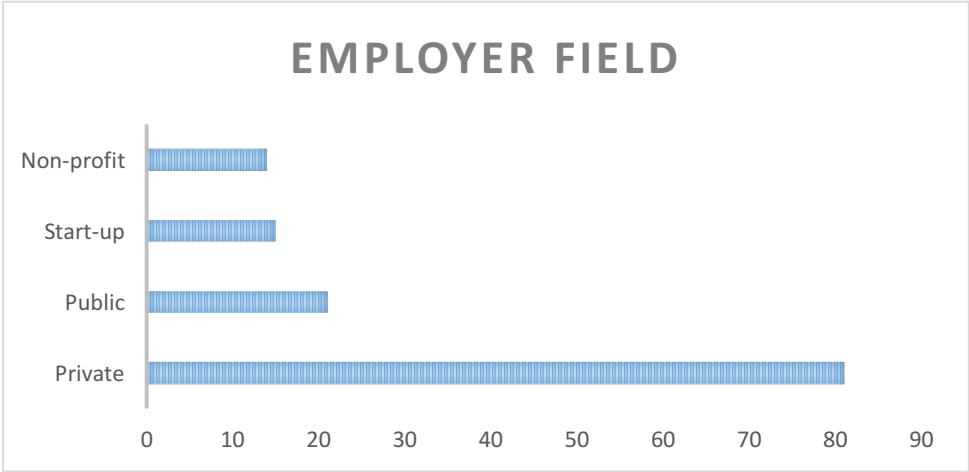


Figure 22: Field of former employer⁴¹

⁴⁰ Own illustration.

⁴¹ Own illustration.

3.2.9 Reasons to join JE



Figure 23: Reasons to join JE⁴²

When asked for the reasons to join their local JE, a big majority named the improvement of their soft skills as most important, followed by improving their network, CV and also hard skills. Furthermore, more than one third of the respondents joined in order to impact the society positively. Besides, another important answer is that students join a JE to learn how to create a company.

⁴² Own illustration.

3.2.10 Skills learned in JE

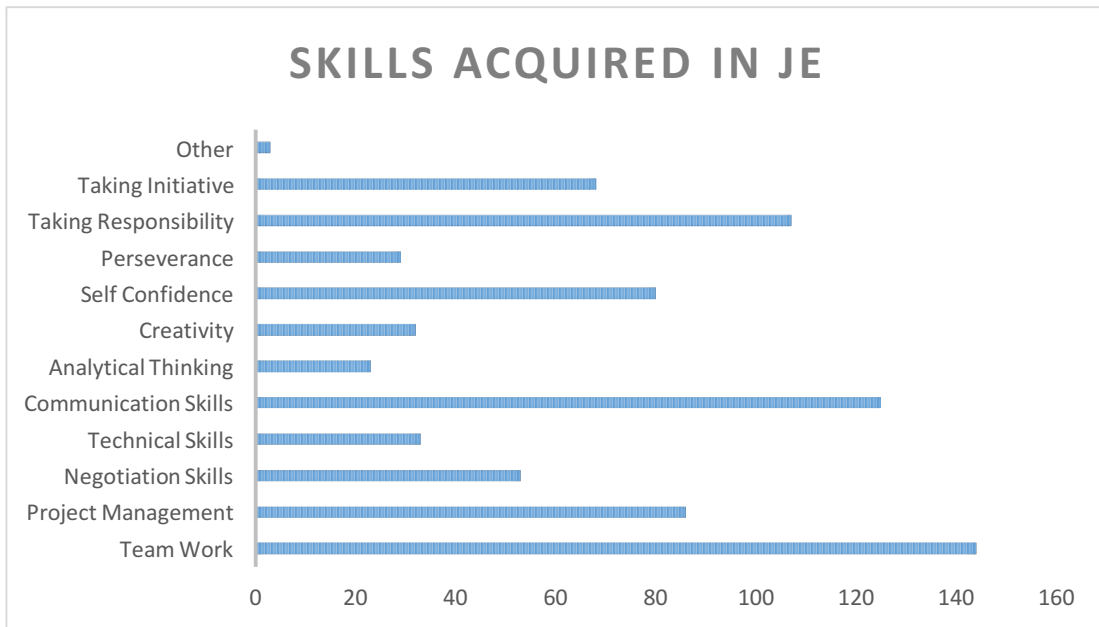


Figure 24: Skills acquired in JE⁴³

The figure above shows the skills, which Junior Entrepreneurs have specified to have learned while working for their JE: more than half named team working skills, communication skills and taking responsibility as main learning. Besides, project management, self confidence, taking initiative and negotiation skills are important factors which are improved by working for a JE according to the respondents. Furthermore technical skills, analytical thinking, creativity and perseverance are quoted by the respondents as important learnings during their work.

⁴³ Own illustration.

3.2.11 Future job expectations

Respondents have been asked as well for their future career expectations after graduating from their current degree. Options were to continue their studies with a new degree/ Masters or MBA program, to obtain a job in the private sector or a public organization, to start their own company or another plan (which shall be specified). This is shown in *Figure 25*.

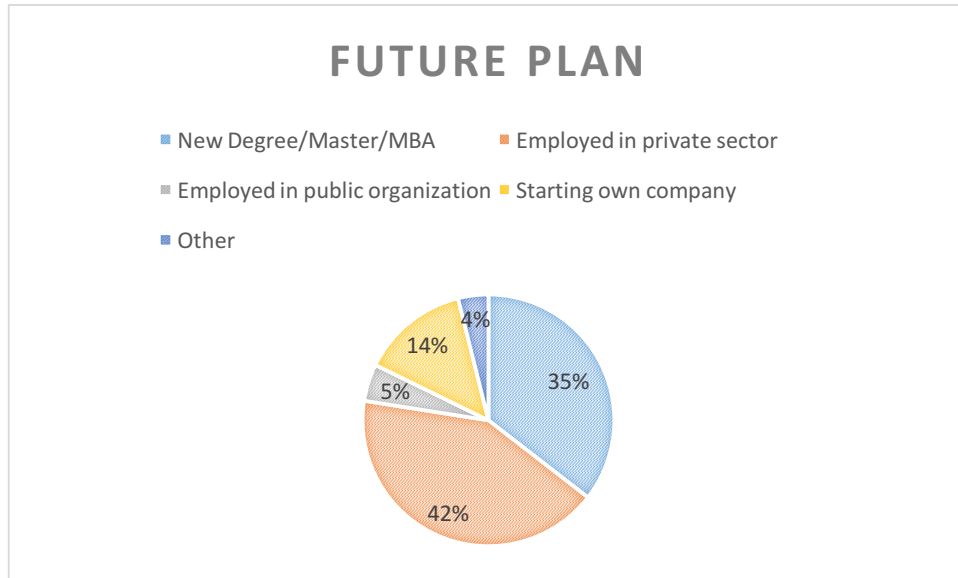


Figure 25: Future prospectives⁴⁴

Out of the 232 answers for this question, more than one third is planning to continue their formation in form of studies after graduating from their current degree. Four percent quote to have other plans after their graduation, like for example travelling. Analysing only the students already planning to enter the job market, it can be seen, that the great majority is aiming at an employment in the private sector but a significant 23% pursue the career goal of starting their own company, as shown in *Figure 26*.

⁴⁴ Own illustration.



Figure 26: Future career goals⁴⁵

3.2.12 Survey Questions

The respondents were members of JEs as well as members of the executive boards of the national confederations. The collection has been conducted during a period of two months. The survey consisted of the following 33 questions, open as well as closed ones:

- What is your complete name?
- What is your gender?
- How old are you? (years)
- What is your e-mail?
- What is your National Confederation?
- What is the name of your JE?
- Have you already lived in any other countries?
- Which languages do you speak?
- What is the name of your University?
- What is your field of study?
- In which year of University are you?

⁴⁵ Own illustration.

- When did you join your JE? (month/year) ex.: 04/2013
- Why did you join a JE?
- How did you get to know the JE Network?
- How many projects (core business) have you performed in your JE?
- How many different types of services were those projects that you performed? (E.g. If you only did projects in communication = 1 type, if you did in communication and strategy = 2 types)
- Which positions have you already had in the JE Network? (Choose the position and how long have you perform it)
- How many hours, on average, do you work per week for the JE Network?
- From the skills/competences below, which ones have you developed since you entered the JE Network? Please choose the ones that you identify the most.
- How many events, from the JE Network, have you attended already? (if not applicable, type 0)
- How much would you recommend the Network to a friend? (Please consider zero as the lowest rate and ten as the highest)
- How much would you recommend the Network to an organization? (Please consider zero as the lowest rate and ten as the highest)
- In which other organization(s) have you been a volunteer?
- Have you ever participate in any mobility exchange program (Erasmus, Leonardo Da Vinci, other)?
- Where have you been during your exchange?
- Have you ever had a job?
- What kind of job did you have?
- Was the company that you worked for partner of:
- Please name the Company/ Companies
- How do you see yourself when you finish your current studies?
- In what field/sector would you like to be working on?
- Which is the company that you dream of working?
- What is your BIG DREAM for the Network?

3.3 Hypothesis

Based on these 33 questions asked in the survey, a data analysis shall be performed, allowing to give an evaluation over the following two main hypotheses. The hypotheses have been defined due to the expectations of the author based on the performed literature research and analysis of the environment of the Junior Enterprise network in the EU.

1. The more time a student works in a JE, the higher are his entrepreneurial intentions.
2. The more projects a student works on in the JE, the higher is his desire for starting a new company.

The hypothesis shall be accepted or rejected based on the results of a regression analysis of the collected data. The regression model and its components are defined in the following paragraph.

3.4 Regression Model

3.4.1 Dependent variable

Expectation of future career

This variable gives insight into the expectations of the student in regards to his future career: whether the student considers becoming an employee in the public or private field, self-employed, starting a new study program or quoted other. The regression analysis will assess if and in the positive case show to which extent these expectations are depending on personal variables about the JE experience and other personal aspects of the student.

3.4.2 Predictor variables

The predictor variables are being used in non-experimental research in order to predict the outcome of the dependent variable, which is the expectation of future career. From the given data set we can identify variables like the number of projects performed in the JE, the time spent in JE, the position(s) held in JE, the skills obtained in JE, as well as individual characteristics like educational background and the propensity for internationalization as the predictor variables of the model. In the course of the analysis these variables have been identified as the most relevant for the analysis of the effect on the Future plan of the students:

1. Directly related to the JE experience
 - a. TimeInJE or TimeAverageWorkinginJe
 - b. NumProjectJE or NumDiffTypeProjectJe
2. Other variables describing circumstances of the student
 - c. Abroad
 - d. GDPByState
 - e. RankingWorld
 - f. YearsUniversityEducation
 - g. Volunteer
 - h. Job
 - i. LinkedIn_Follower

3.4.3 Control variables

Control variables are variables which are kept constant in order to make the outcome of the regression comparable. In the present study, the variables Age and Gender are the control variables.

3.4.4 Model specification

The specification of the regression model to be applied defines which predictor variables are to be included or excluded from the model. The regression model will then express in a theoretical way in which causal relationship the dependent variable and the predictor variables are standing (Allen, 1997). To ensure the correctness of the model, the specification is crucial. Attention needs to be paid on not including irrelevant predictor variables as well as not to exclude relevant ones. Looking at the relevance of the different predictor variables, the following model has been selected as a base for the analysis:

Expectation of future career

$= b_1 * \text{time spent in the JE} + b_2$

$* \text{number of projects performed in the JE} + b_3$

$* \text{individual characteristics}$

Formula 1: Regression model

In an iterative approach, insignificant independent variables have been removed in order to achieve the most relevant results and to prove the correctness of the statistics.

3.5 Multinomial regression analysis in STATA

To make the best use of the collected data and draw conclusions about the future career plans of Junior Entrepreneurs currently in education, a thorough analysis of the data has been undertaken. The following paragraph serves to explain the found results, interpret them and draw conclusions.

The behaviour of students has been analysed by several regression analyses combining different variables of interest. Different variable combinations have been tested and in an iterative approach, statistically insignificant independent variables have been removed and in order to find significant models. The statistics software STATA offers two different functions for this kind of analysis: mprobit and mlogit. Both commands allow for a multivariate regression including both, categorical and numerical variables with a different calculation method. Both functions have been tested and the mlogit has been chosen due to the higher exactness of the calculation, that is, the models converged to a result with fewer iterations than using the mprobit function.⁴⁶ Using the mlogit function, the models have been specified in an iterative approach. The base model of Time spent in JE and Projects worked on and the same control variables Age and Gender have always been kept to ensure the results are comparable.

The regression analysis has given the following coefficients for models 1, 2 and 3 where the coefficient are statistically significant for a p-value < 0,10:

Model 1: $0.0576331 * \text{TimeAverageWorkinJE} + 0.1605417 * \text{NumProjectJE} + 0.4023446 * \text{LogRankingWorld} - 0.4477939 * \text{LogGDPByState} + 0.4956825 * \text{Age} - 0.4088188 * \text{Gender} - 0.7687143 * \text{Volunteer} + 0.2133723 * \text{Abroad}$

Model 2: $0.0726541 * \text{TimeInJE} + 0.0597475 * \text{TimeAverageWorkinJE} - 0.3008318 * \text{NumProjectJE} + 0.6285521 * \text{LogRankingWorld} + 0.4074468 * \text{Age} - 0.3959497 * \text{Gender}$

Model 3: $0.0487168 * \text{TimeAverageInJE} + 0.1347011 * \text{NumProjectJE} + 0.6137161 * \text{LogRankingWorld} + 0.4493837 * \text{Age} - 0.439853 * \text{Gender}$

Compare *APPENDIX 2: STATA Learning Documents*.

Due to the ambient of this thesis being social sciences, a p value of <0.10 is considered statistically significant. These global models of the relation between independent variables and the dependent variable are however not giving sufficient explanation about the explicit effect for each different outcome of the dependent variable. Therefore, these effects are measured by an analysis of the marginal effect on each future outcome. The marginal effect is as well calculated by a command in STATA and will be presented in chapter 4.

In model 1, presented in chapter 4, the independent variables TimeAverageWorkinJE, NumProjectJE and LogRankingWorld, LogGDPByState, (which are variables created from the logarithm of RankingWorld⁴⁷ and GDPByState respectively), Volunteer and Abroad have been tested for their correlations between each other, for their statistical significance in the regression towards the future as dependent variable and for their marginal effect on the dependent variable Future and its different categories. Future is a categorical variable which describes the ambitions of the students after finishing their current degree. It has the values 1=starting a new master/MBA 2=employed in the private field 3=employed in a public institution 4=starting your own business and 5=other.

Model 2, following the removal of insignificant independent variables, is composed by Future as dependent variable and TimeInJE, AverageTimeWorkinJE, NumProjectsJE, LogRankingWorld as independent variables, Age and Gender are kept as control variables. Model 3 the residing model after removing TimeInJE due to the similarity to AverageTimeWorkinJE.

In this chapter, the actions taken in order to drive the research have been presented. First, a questionnaire has been sent out to the JE network, aiming at understanding the identity of the Junior Entrepreneur and his future career expectations. The received dataset has been cleaned and reworked, so it would be usable in the chosen data analysis software STATA. As a first step, two research hypotheses to be studied by the data analysis were defined. The use of the complex program and its

⁴⁷ This is done in order to put the variable on the same scale of magnitude as the other variables.

commands have been studied in order to subsequently drive the analysis of the obtained data. The variable future was defined as the dependent variable. Subsequently, for the analysis, the independent variables that are of interest have been defined and the regression models decided. As these global models are not giving enough information about the specific future outcomes, the marginal effects of each independent variable on each future outcome are analysed in the following paragraph.

4. Results

4.1 Analysis

In this paragraph, the interpretation of the results of the analyses is presented. First of all, model 1 is presented. It comprises all independent variables which were worked with, such as the GDP of the state of origin of the students (GDPByState), rank of university on the global ranking (RankingWorld), international propensity (Abroad) and the readiness to work in a non-profit approach (Volunteer). Subsequently two further models, model 2 and model 3 are shown. Model 2 has been created by removing statistically insignificant variables, so as to keep only significant variables of a higher significance level. In model 3, also TimeInJE has been taken out due to its lower significance level specifically for future outcomes 2 and 4 – which are focused on employability and entrepreneurship.

When interpreting the results of the analyses, it can be seen, that different independent variables are statistically significant for the dependent variable future. Outcome 1 has been selected as the baseline for the regression, as it is not in the center of attention of the analysis and thus can be taken as the normalization variable.

Prior to the regression analysis, the correlations of the independent variables have been tested (compare Table 3: Correlations found in mlogit regression analysis, 5 and 7) in order to ensure there are no correlated variables in the analysis, which would produce errors. This procedure applies to all the conducted models.

	Time Average Workin JE	Num Project JE	Log Rank ing World	Log GDP By State	Gender	Age	Volun- teer	Abroad
Time Average Workin JE	1.0000							
Num Project JE	0.3591	1.0000						
Log Ranking World	0.1264	-0.1943	1.0000					
LogGDP ByState	0.1016	0.3350	-0.6175	1.0000				
Gender	0.206	0.1057	-0.1245	0.0154	1.0000			
Age	0.1675	0.1491	0.0152	0.1154	0.2047	1.0000		
Volunteer	0.0440	-0.0719	0.0569	-0.1084	-0.0174	0.0190	1.0000	
Abroad	0.0558	0.2208	-0.1003	0.3455	0.0028	0.1403	0.0374	1.0000

Table 3: Correlations found in mlogit regression analysis Model 1

It can be seen, that the variables chosen for the analysis do not show correlations, the indicator for that are the coefficients which are below 0.5. Subsequently, the regression model can be applied to the given data and thus analyse the effects of the different independent variables on the dependent variable.

Table 4: Marginal effects found after mlogit Regression analysis shows the marginal effects of each independent variable on the different categories of the dependent variable future as the results of the regression analysis of the defined model. The columns stand for the described categories 1-5 as outcome of the future career expectations of the students. The rows stand for the independent variables. As explained below the table, values which have been found statistically significant (with p-value <0.1) in the regression analysis, are marked with *. In case a value is marked

with *, this value is the proven marginal effect of the concerned independent variable on the specific category of the future career expectations.

The following findings become clear: on Future outcome 2, TimeAverageWorkinJE has with -0.0152 and the value $p < 0.05$ a slightly negative marginal effect. Similar accounts for Volunteer: it has a slight negative marginal effect on Future outcome 2 of -0.147 and a p value that suggests statistical significance ($p < 0.1$). On the contrary, NumProjectJE has a positive marginal effect of 0.0287 with statistical significance ($p < 0.1$) on Future outcome 2. These findings show, that students who work many hours for a JE or who have a background with volunteering are less wishing to be employed in the private sector. Whereas, students who worked on a high number of projects during their time in a JE express more the desire to work in the private sector. Working for a JE is a kind of volunteering, as in most of the cases there is no salary paid directly to the students but the money earned in the projects is reinvested in trainings or events for the Junior Entrepreneurs. The fact, that students who work for many hours in a JE or volunteering experienced students are expressing less the wish to work in the private sector becomes therefore obvious, as these students assumingly do have a different set of values.

Looking at Future outcome 4, which stands for the entrepreneurial intentions of students, TimeAverageWorkinJE has been found with a statistically significant ($p < 0.05$) positive marginal effect of 0.00562. Also, LogRankingWorld has with 0.0217 and a p value below 0.1 a positive marginal effect on this category. On the contrary, LogGDPByState has with -0.0269 and $p < 0.1$ a negative marginal effect. The variables NumProjectJE, Volunteer and Abroad are statistically insignificant for this outcome. This means, that students who spend many hours working for their JE, express the wish to start their own business after graduation. Students who have worked for a longer period in a JE and are from a University of high global Rank are expressing more the wish to start their own business. This is an interesting observation, as it can be assumed that students would have a higher self-confidence when it comes to their academic background. This can facilitate entrepreneurial intentions, as mentioned in paragraph 1.4. Students who come from countries with a high GDP are expressing less the wish to become an entrepreneur. This can be explained by the intrinsic efforts for seeking opportunities of students from countries with low GDP and vice versa by the abundance of opportunities in countries with high GDP, where entrepreneurship is not a necessity for being successful.

Another interesting observation is, that NumProjectJE is statistically insignificant for Future outcome 4 but has a positive marginal effect on Future outcome 2. This means, students who have worked on a lot of Projects during the time in their JE are striving for an employment in the private sector, whereas no statement can be made towards their entrepreneurial intentions. The background for this effect lies in the system of Junior Enterprises, which is mostly divided between the project teams and the managing body of the JE. The project teams are the students mostly working on the projects which is a consultancy approach, these people mostly try to get a job at the big consultancy firms. On the contrary, the managing body are the ones with more entrepreneurial knowledge and therefore rather have intentions to start their own business.

VARIABLES	(1) Marginal Effects 1	(2) Marginal Effects 2	(3) Marginal Effects 3	(4) Marginal Effects 4	(5) Marginal Effects 5
TimeAverageWorkinJE	0.00507 (0.00706)	-0.0152** (0.00735)	0.00320 (0.00228)	0.00562** (0.00281)	0.00130 (0.00199)
NumProjectJE	-0.0173 (0.0158)	0.0287* (0.0160)	0.00519 (0.00459)	-0.0117 (0.00862)	-0.00491 (0.00573)
LogRankingWorld	-0.0368 (0.0273)	0.00562 (0.0278)	0.00630 (0.00929)	0.0217* (0.0123)	0.00314 (0.00803)
LogGDPByState	0.0266 (0.0349)	-0.00590 (0.0353)	0.0107 (0.0115)	-0.0269* (0.0157)	-0.00451 (0.0105)
1.Gender	0.0866 (0.0772)	-0.0847 (0.0790)	0.0212 (0.0303)	-0.00847 (0.0326)	-0.0146 (0.0223)
Age	-0.116*** (0.0269)	0.120*** (0.0270)	-0.00834 (0.0101)	0.0135 (0.0111)	-0.00877 (0.00757)
1.Volunteer	0.168** (0.0740)	-0.147* (0.0759)	-0.0173 (0.0280)	-0.0486 (0.0336)	0.0446 (0.0290)
1.Abroad	-0.00553 (0.0841)	0.0105 (0.0856)	-0.0218 (0.0284)	0.0144 (0.0396)	0.00240 (0.0263)
Observations	213	213	213	213	213

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 4: Marginal effects found after mlogit Regression analysis Model 1

In this paragraph, the correlation analysis and following the regression analysis are shown. In order to ensure an error-free regression analysis, first it has been ensured that there are no correlations between chosen independent variables. Different methods of

regression analysis have been tested, and the one delivering statistically better results, mlogit, has been chosen. The results of the regression analysis showed clearly that students who have worked for a long time in a JE express the wish to take entrepreneurial action. In *chapter 4.2* the above described model with removed insignificant independent variables is presented.

4.2 Further analyses

The following two analyses are showing the coherence of the found results. They also proof the validity of the model after iteratively removing independent variables with a lower significance level especially taking into consideration future outcomes 2 and 4 which are the ones in the centre of attention of the present analysis.

For the correlation analysis of the newly iterated model: besides one slight exception of 0.5467 for NumProjectJE, none of the tested variables show correlation between each other. Therefore, the chosen variables can be used for the regression analysis.

	TimeInJE	TimeAverage WorkinJE	NumProject JE	LogRanking World	Age	Gender
TimeInJE	1.0000					
TimeAverage WorkinJE	0.2169	1.0000				
NumProject JE	0.5467	0.3591	1.0000			
LogRanking World	-0.0717	0.1264	-0.1943	1.0000		
Age	0.2645	0.1675	0.1491	0.0152	1.0000	
Gender	0.0398	0.0206	0.1057	-0.1245	0.2017	1.0000

Table 5: Correlation analysis Model 2

The results of the regression analysis give proof about the positive influence of time spent in the JE on entrepreneurial intentions of the student, as both variables TimeInJE and TimeAverageWorkinJE have a positive marginal effect (0.00294 and 0.00435 respectively) on entrepreneurial intentions (Future 4). The rejection of hypothesis 2 is also confirmed, as the Number of Projects conducted in the JE has a

negative marginal effect of -0.02 on future 4. The result also confirms the positive marginal effect of LogRankingWorld on entrepreneurial intentions.

VARIABLES	(1) Marginal Effects 1	(2) Marginal Effects 2	(3) Marginal Effects 3	(4) Marginal Effects 4	(5) Marginal Effects 5
TimeInJE	-0.0115** (0.00464)	0.00569 (0.00429)	0.00119 (0.00135)	0.00294* (0.00166)	0.00167 (0.00127)
TimeAverageWorkinJE	0.00492 (0.00675)	-0.0141** (0.00702)	0.00346 (0.00222)	0.00435* (0.00260)	0.00134 (0.00211)
NumProjectJE	0.00786 (0.0173)	0.0188 (0.0177)	0.00437 (0.00506)	-0.0200** (0.00971)	-0.0110 (0.00736)
LogRankingWorld	-0.0442** (0.0209)	-0.000341 (0.0217)	0.00166 (0.00858)	0.0363*** (0.00974)	0.00655 (0.00702)
Age	-0.103*** (0.0255)	0.113*** (0.0258)	-0.00956 (0.0106)	0.00884 (0.0106)	-0.00921 (0.00862)
1.Gender	0.0783 (0.0757)	-0.0863 (0.0776)	0.0203 (0.0308)	-0.00112 (0.0315)	-0.0112 (0.0259)
Observations	215	215	215	215	215

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 6: Marginal effects Model 2

The last model is obtained by removing also TimeInJE due to its lower statistical significance compared to the other independent variables especially when focusing of future outcomes 2 and 4. It comprises the following independent variables: TimeAverageWorkinJE, NumProjectJE, LogRankingWorld, Age, Gender.

	TimeAverage WorkinJE	NumProject JE	LogRanking World	Age	Gender
TimeAverage WorkinJE	1.0000				
NumProject JE	0.3591	1.0000			
LogRanking World	0.1264	-0.1943	1.0000		
Age	0.1675	0.1491	0.0152	1.0000	
Gender	0.0206	0.1057	-0.1245	0.2047	1.0000

Table 7: Correlation analysis Model 3

This model presents the same base as the other two models and therefore also states the same outputs: The more time a student spends working for his JE, the higher are his intentions towards entrepreneurship. Furthermore, the higher his university is scoring in the global ranking, the more likely he desires to become an entrepreneur.

VARIABLES	(1) Marginal Effects 1	(2) Marginal Effects 2	(3) Marginal Effects 3	(4) Marginal Effects 4	(5) Marginal Effects 5
TimeAverageWorkinJE	0.00435 (0.00670)	-0.0137** (0.00696)	0.00346 (0.00220)	0.00450* (0.00268)	0.00141 (0.00224)
NumProjectJE	-0.0152 (0.0149)	0.0289* (0.0151)	0.00608 (0.00451)	-0.0131 (0.00837)	-0.00679 (0.00651)
LogRankingWorld	-0.0470** (0.0210)	0.00270 (0.0214)	0.00144 (0.00837)	0.0364*** (0.00953)	0.00642 (0.00709)
Age	-0.106*** (0.0252)	0.111*** (0.0252)	-0.00766 (0.0102)	0.0124 (0.0106)	-0.00904 (0.00889)
1.Gender	0.0895 (0.0749)	-0.0928 (0.0764)	0.0170 (0.0300)	0.000358 (0.0323)	-0.0140 (0.0267)
Observations	216	216	216	216	216

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.10

Table 8: Regression analysis Model 3

4.3 Interpretation

The hypothesis 1 could be accepted by all conducted regression analyses: there is a clear positive relation between the time spent working for a JE and the entrepreneurial intentions. The hypothesis could be proven by all driven analyses. Not only the hours spent working, but also the period length of an active membership in a JE have been found with a positive marginal effect on entrepreneurial intentions of students. The finding of the importance of non-formal education in the entrepreneurship field is supported by different academic papers, for example by Turker et. al (2009). This means in general, the longer the time period or higher involvement of student in his JE, the more the student has intentions to start his own business after graduation. So, these students have spent a lot of time learning, applying their knowledge and teaching new students joining the JE and therefore feel prepared

to cope with the entrepreneurial challenges. This conclusion is supported by many sources, among other by the NTL learning pyramid (National Teaching Laboratory Institute, 1960) stating that a practical application of the theoretically acquired knowledge and teaching it to others is the best way to learn and the exact approach on which the JE concept is based. The by-results of this hypothesis test were on the first sight quite surprising, as it can be seen, that the time spent working for a JE has a negative marginal effect on the student's intentions to be employed in the private sector. This phenomenon, however, can be easily explained looking at hypothesis 2.

Hypothesis 2 had to be rejected: no statistically significant proof has been found, that the number of projects elaborated has a positive effect on the intentions towards entrepreneurship. However, what has been found in the research, is that the more projects a student has been actively working on during the time in a JE, the more he or she desires to get an employment in the private sector. Thus he or she feels prepared for the corporate job market. Many consulting companies prefer to hire alumni from the JE network, which is also proven by the literature (Domsch & Hristozova, 2006). The unexpected result in the first hypothesis can subsequently be explained as follows: JEs are typically divided into the project teams and the administration and lead of the company. The students in the project teams are working in a consultancy approach on projects for clients (i.e. companies in the industry), these students typically aim for a job at the big consultancy firms after their graduation. The students who work in the administration and lead of the JE, however, are the ones with most entrepreneurial knowledge and experience and thus the ones who feel more prepared to face the challenges of entrepreneurship. In *APPENDIX 1: Support*, interviews of JE Alumni and their successful entrepreneurial career paths are shown, which give real world examples to prove these results.

As a conclusion, the acceptance of hypothesis 1 when interpreting the results of the driven analyses, shows that the activity in a JE does influence a student's individual intentions towards entrepreneurship positively. Even though hypothesis 2 had to be rejected due to the lack of statistically significant proof, another interesting by-effect has been detected: students who have been involved in many corporate projects express the desire to start a career in the private sector. This shows, that these students thanks to the practical experience, feel prepared for the job market. These

findings are also confirmed by the findings of a study about entrepreneurship education among alumni, conducted by the European Commission: JE alumni in general spend a very short time looking for employment after their graduation in comparison to other students (Gibcus, et al., 2012). This is an indicator for students' preparedness for the job market. The study also confirms the increased awareness and intentions towards entrepreneurship among JE alumni.

5. Limitations

As this analysis is based on the data collected by an online survey conducted by JADE, only intentions towards entrepreneurial action and future job perspectives could be measured. With the available data set, it was not possible to measure the real outcomes, i.e. the final creation of new enterprises or real type of job acquired by the student in the end, only their intentions and thereby self-efficacy and self-confidence influenced by their work in a JE for their future endeavours could be measured. A further limitation of the study is, that there are no empirical data of companies, tackling the readiness for the job market of Junior Entrepreneurs, but only some testimonials of single companies.

In order to measure the real impact, a large-scale alumni study should be conducted and compared, how big the real effect on entrepreneurship and job preparation is.

6. Conclusion & Future outlook

The major outcomes of the conducted study and the drawn conclusions will be illustrated in this paragraph. In the present work, a broad research of literature about the forms and contents of entrepreneurship education and its importance has been conducted. Entrepreneurial competences have been analysed and thanks to a study by the European Commission among entrepreneurship alumni, entrepreneurial propensity and intentions of those alumni compared to a control group of other alumni could be understood. It has been found out, that students either from an academic entrepreneurship program or an extra-curricular activity like a Junior Enterprise are significantly more entrepreneurially oriented and skilled than other students. Further analyses of the existing academic literature about entrepreneurship education brought the conclusion, that entrepreneurship education is not only important in terms of entrepreneurial skills development and capacity building but also for creating awareness and fomenting the ability of spotting business opportunities and the pursuing opportunity beliefs. *Chapter 2* gives profound insights into the JE concept and the importance of JADE in the European environment and its activities. The European Commission has put entrepreneurship education on its agenda as a key priority since the Oslo Agreement in 2006 (European Commission, 2006). Different initiatives to support this activity are existing on European level and the JE concept is one of them. The concept and work of JADE is largely recognized as a best practice for entrepreneurship in the higher education sector.⁴⁸ Indeed, through a complete learning by doing experience, students already manage a company and provide services to clients with the JE portfolio being embedded with the university curriculum. The Junior Enterprise concept serves not only to prepare students for the job market, to equip them with entrepreneurial thinking and skill but also as a tool for the personal development. The methodology of the research is explained in *chapter 3*. It is based on a questionnaire among students of the JE network, aiming at understanding the identity of the Junior Entrepreneur and his future career expectations. The received dataset has been cleaned and reworked, so it would be usable in the chosen data analysis software STATA. As a first step, two research hypotheses to be studied by the data analysis were defined. The use of the complex program and its commands have been studied in order to subsequently conduct the analysis of the obtained data. The variable future was

⁴⁸ Compare APPENDIX 1: Support.

defined as the dependent variable, then independent variables of interest for the analysis have been defined and the regression model decided. In order to ensure an error-free regression analysis, first it has been ensured that there are no correlations between chosen independent variables. Different methods of regression analysis have been tested, and the one delivering statistically better results, mlogit, has been chosen.

The results of the regression analysis explained in *chapter 4* showed clearly, that students who have worked for a long time in a JE express the wish to take entrepreneurial action. As a conclusion of the data analysis, the acceptance of hypothesis 1 shows that the activity in a JE does influence a student's individual intentions towards entrepreneurship positively. An interesting by-effect has been found, which is that students who have been involved in many company projects, express the desire to start a career in the private sector and thus shows, that these students thanks to the practical experience, feel prepared for the job market.

Due to the setting of the survey and a lack of data about the transformation of students' entrepreneurial intentions into entrepreneurial action, the study is limited to the entrepreneurial intentions, as explained in *chapter 5*. Summarizing the conducted research, it is becoming increasingly obvious that entrepreneurship education is an important factor to support and foster entrepreneurship not only in Europe but all over the world. The economic growth of a society depends highly on the ambitions of young and innovative entrepreneurs. Formal education in the entrepreneurship field has proven to equip students with the required knowledge, whereas it is criticized for the factors of fostering an entrepreneurial attitude and also skills due to the lack of orientation towards practice. The skills needed in order to become an entrepreneur can be learned much better in the way of non-formal education, as by experiential learning. The Junior Enterprise is a good possibility of skills and personal development where ideas can be tested in a low-risk environment. The surrounding of like-minded fellows in a local, national and European network gives further support of developing entrepreneurial attitudes. The data analysis conducted in the present work has shown that the Junior Enterprise concept is a valid concept to support non-formal entrepreneurship education and especially helps to foster the entrepreneurial attitude of students. The JE concept and movement, as well as JADE as an organization have found strong support from the European Commission, the President of the European

Parliament and many actors from the academia and corporate world, thanks to their good experiences with the reality of Junior Enterprises and their Alumni.⁴⁹ By working in a Junior Enterprise, students much rather develop the wish to become an entrepreneur and feel better prepared for the corporate job market than other students. As proven in the analysis of data of 261 Junior Entrepreneurs, working for a JE positively influences the propensity of becoming intrapreneurs in existing organizations or becoming entrepreneurs themselves. This is a clear advantage compared to other students who are less likely to challenge the status quo and develop into the direction of self-employment as they might not feel as prepared for this challenge as Junior Entrepreneurs.

Future outlook

The study on the basis of the current research will be repeated this year, taking into account several improvements in the questions, to obtain more meaningful results. Also the communication channel of the survey to reach Junior Entrepreneurs will be restructured in order to obtain more answers and thus make the study more representative. In the coming years, the collection of data about the network will be increasingly important as this is the only way for to ensure a sustainable growth and the recognition of the JE movement, which is growing every year around the globe. More and more universities understand the importance of learning-by-doing and putting into practice the mostly theoretically learned technical skills. For soft skills development, a non-formal learning approach is crucial (European Commission). Also more and more entrepreneurial programmes at Universities are being implemented. This is a promising development for fostering entrepreneurship in a sustainable way in order to ensure economic growth and the realization of innovation in our future society.

⁴⁹ Compare *APPENDIX 1: Support*.

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APPENDICES
APPENDIX 1: Support

1. Stories of Successful JE Alumni

In the following, two Junior Entrepreneur alumni who turned their entrepreneurial intentions into action and created their own business are presented. They have been interviewed to show how the JE experience and network helped them to become successful entrepreneurs.

Giorgio Azzurra, CEO at in-recruiting

In-recruiting is the web-based HR software that helps companies to streamline the recruitment and selection of candidates. It simplifies every stage of the process, job posting, organization of CVs up to interviews, to choose the right candidate. All in one place. The Applicant Tracking System is designed for Corporation, SME, Head Hunters and Employment Agencies.⁵⁰

How much were you involved in your J.E. / Confederation? What was the added value with respect to the university?

My experience in the J.E. movement changed my life and made it full of wonderful opportunities to learn and grow, as well as full of great people that are still part of my life today.

I've been involved both in my JE (JEME Bocconi) and in JADE Italia as Vice President and Responsible for Communication and International Relations, as well as project manager and team member: I really experienced all the best from the movement and it gave me the opportunity to face the real world and become a professional, even before finishing my studies. It was a boost for my career but, most of all, one of the deepest experiences I still bring with me in my heart. Still today, everyday, I benefit from what I've learnt in those great years.

How did you think about starting your own business? Why in this field?

I've always been a person who “does” and “makes things happen”: I love to create things from nothing and to make things real... but the J.E. experience made my entrepreneurial spirit living! Actually, everything started in a group of former J.E.

⁵⁰ <http://www.in-recruiting.com/en/>

colleagues: Matteo Cocciardo involved me in the project and, supported by other 4 J.E. friends, we built up the first release of the software and installed the business in the incubator of Turin Polytechnic University. Our interest in HR and recruiting came from the experience in our JEs: we all had organized career days and had contacts with HR managers from international top companies...we really were into the business!

What are the main issues you faced?

Of course, working every day for In-recruiting has been full of issues...sometimes I failed facing them, sometimes I was successful. But every time I gained more experience and learnt something new to go ahead. Maybe the most difficult issue was to stay strong and full of trust, positivity and faith: you need to have a good attitude, in good and in bad times, to keep on searching for success.

Do you think entrepreneurship is something we can learn in school, or is it in our blood, or it is something we should “learn-by-doing”?

I am convinced that entrepreneurial spirit is something that can be in your heart since you are a little girl or boy, but it can also arise from experiences you live and people you meet in your life, as it has happened to me. Spirit is a fundamental part of entrepreneurship but it is not everything: you also need competences and capabilities that can be built thanks to experiences “on the job”...but you also need to study! Regulations, business planning and accounting techniques, investors and market practices are part of the knowledge that entrepreneurs should own to be competitive: I am convinced that these can be subjects of university courses, especially if strongly linked to real cases presented to students.

How is digitalization changing the scene for entrepreneurs?

Digitalization means increasing opportunities everyday: opportunities to learn, to develop your products/ services, as well as to acquire customers and expand your business. Of course it also increases threats: your competitors will have the same opportunities and they will take a look at your business more easily.

Thomas Masek, CEO at crossvertise

Founded in 2011, crossvertise has developed a fully-automated media booking platform. This enables companies to easily plan and book cross-channel ad campaigns

from a single source. We operate the largest media database, including out-of-home, radio, print, online, mobile, TV, as well as cinema.⁵¹

How much were you involved in your JE? What did it teach with respect to your university?

I was really involved in my JE as a member of the management board and project manager of internal projects. I really helped to shape my JE during my time as active member. I worked on a lot on consulting projects and helped the board of BDSU (German Confederation of JEs) as member of the supervisory board. I learnt especially to act and take decisions on my own responsibility.

How did you think about starting your own business? Why in this field?

I had developed the basic idea during my JE-time, discussing and shaping and making it evolve with friends from other JEs (all my co-founders worked in JEs as well). Our approach was to solve the problem of a time- and cost- consuming media buying process due to the big diversity in types of media (TV, Radio, Print, Out-of-home, Cinema, Online, Mobile) and the high number of publishers combined with a lack of standards and lack of market transparency.

What's the difference between being your own boss and working for a company?

You work for yourself and the results are your own. In case of success it is very motivating, in case of failure it can be pretty harsh and existential.

That leads to a lot of working hours and a steep learning curve.

What are the main issues you faced?

One of our main challenges was fundraising. Especially due to a disruptive innovation and the goal of quick growth, we had a need for capital.

We had to put a lot of time and effort in fundraising and had more than one situation where we could not do the best for the company due to lack of liquidity.

What are your expectations about the evolution of your business?

Right now we are growing really fast and we are in a great position at the center of digitalization in the media-sector. In future we will further simplify and automate planning, booking and executing advertising campaigns and finding new customers.

Do you think entrepreneurship is something we can learn in school, is it in our blood, or is it something we should “learn-by-doing”?

⁵¹ <https://www.crossvertise.com/>

The most important “skills” are to take risks and make decisions even in case of a lack of information. Entrepreneurship courses help to execute the idea, so I do recommend to learn what you can in school. But you also have to be prepared to sacrifice a lot of free time and to take risks.

2. Testimonials of Support

To illustrate the appreciation of the concept not only from the students point of view but also from external stakeholders points of view, the following testimonials are presented. From the academic side, the corporate side, and the policy side, the JE concept is highly supported.

“I want to congratulate JADE for its involvement in encouraging entrepreneurial skills in Europe. (...) In addition to their studies, 22.000 students are practically involved into the running of non-profit SMEs in Europe: that is an impressive number of young Europeans learning how to become entrepreneurs, and moreover discovering social entrepreneurship”

Martin Schulz, President of the European Parliament

"JEs bring added value to both the university and the economic environment that surrounds it. As a teacher, I had the opportunity to work with JE for different projects. We have organized events and carried out studies on the national level. All of these experiments were done with great professionalism and seriousness. I can only recommend and support the students who are part of these associations and who stand out during their academic journey."

Vincent Pignon; PhD; Professor in Strategy and Entrepreneurship at University of Geneva.

"I believe, as a teacher and as a former Junior-Entrepreneur, that it is of paramount importance for students to take part in a Junior-Enterprise. This experience teaches them how to connect their theoretical knowledge, acquired during their studies, to real projects with companies. It also provides them with professional experience, and helps them develop their networks (companies, students of their national confederation and international confederations). This is why I strongly recommend my students to join a Junior-Enterprise for all the benefits it can provide them, not only on a professional level, but also as part of their personal development." Elyes Chaouch, English Professor, Erasmus coordinator, Information-Communication Department , IUT - University Paul Sabatier

“I believe, JEs are for companies a great addition to the classic consulting. The classic consulting is mostly about standard projects, there is also a bit of creativity in it, but Junior Entrepreneurs usually go a step further. They are more radical, innovative, creative then classic consultancy firms.

Prof. Gunther Friedl, Dean of TUM School of Management

“We are proud to encourage associative life in schools and universities by supporting JEs. We share the strong values and we are committed to quality and excellence, a sense of responsibility, rigor and a sense of teamwork. The collaboration with JEs is essential to us because it allows us to interact with many young dynamic students, with an interest in topics that we are close to.”

Jean-Pierre Letartre, President of EY France, CEO of EY France, Luxembourg and Morocco.

APPENDIX 2: STATA Learning Documents

<http://data.princeton.edu/wws509/stata/mlogit.html>, retrieved 20.12.2016

<http://www.ats.ucla.edu/stat/stata/dae/mlogit.htm>, retrieved 20.12.2016

STATA 13 manuals: Users guide, mprobit manual, mlogit manual retrieved from <http://www.stata.com/features/documentation/> on 20.12.2016

APPENDIX 3: Dataset

The entire dataset can be found in the separate Excel File:

Dataset.xlsx

APPENDIX 4: Financial Aspects

Due to the nature of this empirical study, mainly human resource cost have incurred. A detailed budget can be seen below. The computer usage cost are explained the purchase price of my personal computer over an estimation of total work-life hours of the computer. In this cost, also electricity usage is accounted.

Master of Science Thesis BUDGET

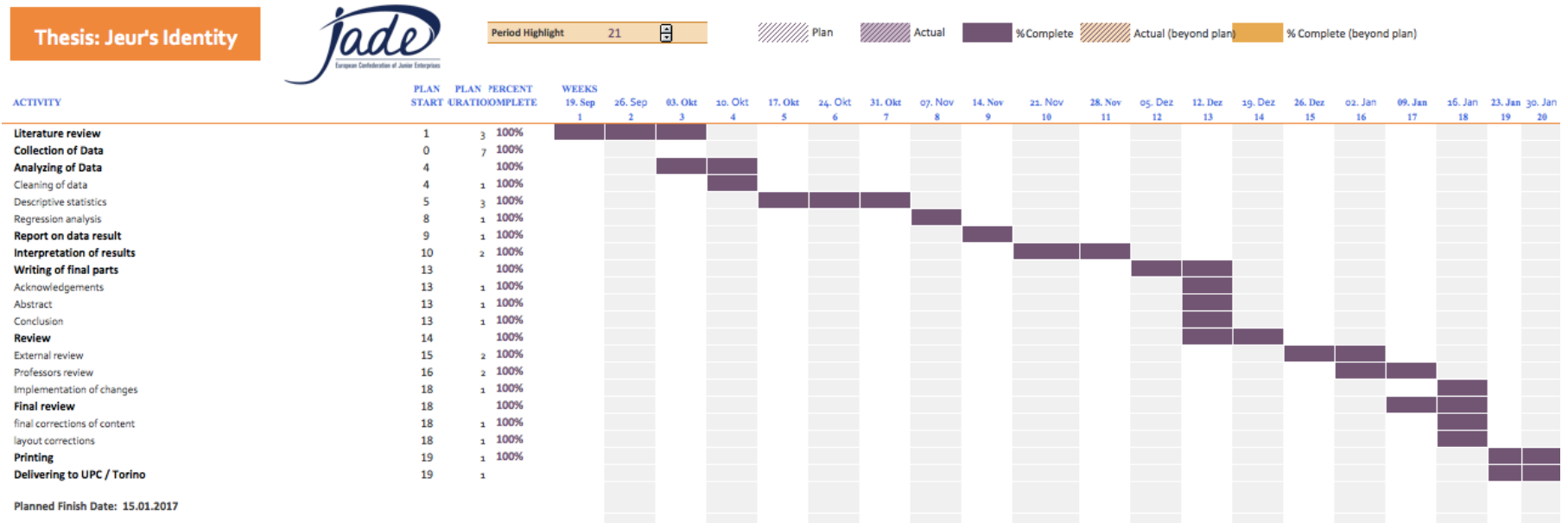
Details

Spending	Amount	Cost in € / unit	Total
Working hours junior engineer	410	20,00 €	8.200,00 €
Hours computer usage	410	0,09 €	35,53 €
License for statistic program STATA 13	1	656,00 €	656,00 €
Survey tool license (survey monkey)	1	0,00 €	0,00 €
External Memory for Data storage	1	49,99 €	49,99 €
Result			8.941,52 €

total life time of computer in hrs	18000
cost per hr computer usage	0,067
cost per hr electricity	0,020

APPENDIX 5: Time planning aspects

Upon the start of this Master's thesis, a Gantt time diagram has been done in order to plan the time until delivery. There have been some unforeseeable delays in the realized time compared to the planned time due to the alignment of requirements in my two universities: the home university UPC and host university Politecnico di Torino. This is because of the nature of the Master being a double degree. Both universities have different requirements concerning content and format, also the graduation periods are not equal. Therefore, a significant delay occurred. The gantt can be seen in the graphic below.



APPENDIX 6: environmental aspects

As this thesis was based on an empirical study and all the research work was done online, the environmental aspects have not been taken into consideration. The organization JADE, however works completely paperless so really the only environmental impact of this work is limited to the use of electricity and the emission of CO₂, which is connected to it.