

## The success of STEM graduates in entrepreneurship training: a European case study

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**Abstract:** Following the results of a two years ERASMUS+, KA2 project, called ‘SCIENT: a European university-business alliance aiming to foster young scientists’ entrepreneurial spirit’, we aim at shedding light on the success story of entrepreneurship training of STEM graduates. Our study research educational methodologies were applied in the project, which ran for 24 months until end of 2017 in seven European Union countries: Cyprus, Malta, Portugal, Lithuania, the UK, Spain and Italy. The project aim was to develop strong entrepreneurial skills for PhD STEM graduates in the quest for alternative professional careers apart from the academic one. The research shows varying feedback responses from three activities: *training*, *internship* and *mentoring* from participants, trainers, and guest speakers. The methodological tools employed are a set of online surveys on 98 participants and 34 trainers from the participating countries. Findings show different countries, presenters, participants, facilities and scheduling provided variable impressions regarding the programme and its specific training modules. There were, however, some wide-ranging agreements across countries and throughout all the programmes. The overall findings indicate a high importance for organised such training programs at STEM graduates level.

**Keywords:** entrepreneurship; start-ups; education; training; European project; knowledge alliance; knowledge transfer; STEM education.

**Reference** to this paper should be made as follows: Mihai-Yiannaki, S., Varnava-Marouchou, D., Konis, E. and Hadjichristodoulou, V. (2020) 'The success of STEM graduates in entrepreneurship training: a European case study', *Global Business and Economics Review*, Vol. 22, Nos. 1/2, pp.198–211.

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This paper is a revised and expanded version of a paper entitled 'Entrepreneurship untapped: testing training for startups by PhD stem graduates' presented at 10th Annual Conference of the EuroMed Academy of Business, Rome, Italy, 13–15 September 2017.

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## 1 Introduction

Our research presents the findings of the analysis of training methodologies used in the funded research: 'SCIENT: a European university-business alliance aiming to foster young scientists' entrepreneurial spirit' (SCIENT), an ERASMUS+, KA2 project that ran for 24 months until end of 2017 in seven European Union countries: Cyprus, Malta, Portugal, Lithuania, the UK, Spain and Italy.

SCIENT's practical aim after a thorough research on EU countries gap on STEM entrepreneurial needs and skills, was to develop an innovative Pan-European entrepreneurship program for PhD STEM students/graduates. Since scientific knowledge lies at the heart of the European knowledge economy, SCIENT focuses on developing successful scientific entrepreneurs by fine-tuning their transversal skills and providing them with a new professional path.

This study has identified both similarities and differences in terms of training content, participants, trainers and guest speakers, amongst the participating countries.

Eventually, the research aimed at making doctoral students and graduates aware of their career options and about the possibility of using their research findings to start their own company, exploiting their opportunities beyond an academic/researcher career.

Specific findings emerge from an online survey from the students who have participated in a pilot training course during 2016, designed for the STEM PhD students and graduates.

## 2 Literature review

Research on entrepreneurship education specifically for STEM seems to have been scarce, (Boocock and Frank, 2006). Nevertheless, there have been some useful contributions that have indicated substantial differences in practice, both, between different STEM programs, different European countries and institutions within them. In this literature review, we attempted to iron out some of these differences and also similarities first by establishing how entrepreneurship education is understood and defined and then by recognising and acknowledging the different approaches to it.

Much entrepreneurship education (EE) literature discusses the trend of the increasing number of EE programmes in universities, but also teaching associated to boosting creativity (Mihai-Yiannaki, 2011, 2012) and knowledge transfer, a major factor in supporting entrepreneurship and eventually learning. According to these traditional

models, students' ability to memorise the deposited information is the principal indicator in learning, via knowledge acquisition and academic success (Breunig, 2017).

The focus however needs to move towards the actual process and content of EE programmes (Vesper and Gartner, 1997) and on overcoming students' attitudes to entrepreneurship (Lackéus, 2015). Furthermore, more current works investigate the course content (Shepherd, 2004), on how external resources are deployed in bringing innovation (Ferraris et al., 2017), and on how SME's engage in open innovation (Santoro et al., 2018). Each of these authors, are making a serious attempt to combine practice with actual observation of what entrepreneurs do and how they learn, yet few consider entrepreneurship as pedagogy (Jones and Iredale, 2010). Also, Jones and Iredale (2010) suggest that entrepreneurship education requires experiential learning styles, creative problem solving and learning by doing in order to engage students.

Wahid et al. (2017) argue that there should be a shift from transmission models (learning 'about') to experiential learning (learning 'for') in order to provide learners with techniques that can be applied in the real world. As such, many institutions are moving towards problem-based learning as a solution for producing students who are creative, and think critically and analytically (Wahid et al., 2017). There is a need for more interactive learning approaches, whereby teachers should act as mentors in a cooperative and interdisciplinary learning process characterised by creativity, meaning making and interactivity (Lackéus, 2015), and where specific business skills and knowledge of how to start a company and run it are successfully transmitted (Wahid et al., 2017).

Since 2006, the European Parliament has recommended that 'entrepreneurship' should be one of the eight key competences for lifelong learning the understanding of the role of entrepreneurship education particularly for STEM is very important as it has a lasting impact on the student learning outcomes, hence the need to embed it in the higher education programmes curricula (European Commission, 2012)

The role entrepreneurship can play in taking on important societal challenges has also positioned entrepreneurial education as a means of empowering people and organisations to create social value for the public good (Volkmann and Tokarski, 2009).

What become key obstacles of STEM entrepreneurship education are also important in order to create measures to overcome them. There is a set of interesting questions to answer on the 'what' and 'how' of the EE. Regarding the 'what', Edelman et al. (2008) highlighted the existence of a gap between what we teach in entrepreneurship and what entrepreneurs do (Fayolle, 2013).

However, most obstacles to STEM entrepreneurship are summarised as: lack of finance (Schoof, 2006), unawareness of the availability of government programs specifically designed to support STEM students and help them in launching their new venture (Maas and Herrington, 2006) and lack of training reducing the managerial and entrepreneurial ability (Orford et al., 2003). Shortages of education is another barrier (Schoof, 2006). Furthermore, there is lack of an integrated approach to policy in this field of study, which also leads to the absence of regular and robust tools for strategic orientation and assessment as well as a lack of replicability (Schoof, 2006).

What is more often, scientists lack the ability to spot business opportunities and develop products that meet customer needs even though they can often explain the general applications of new technologies (Markham et al., 2002). Besides STEM has to move away from the long standing functional approach to business education to one that also embraces specific skills specially designed for STEM students while businesses

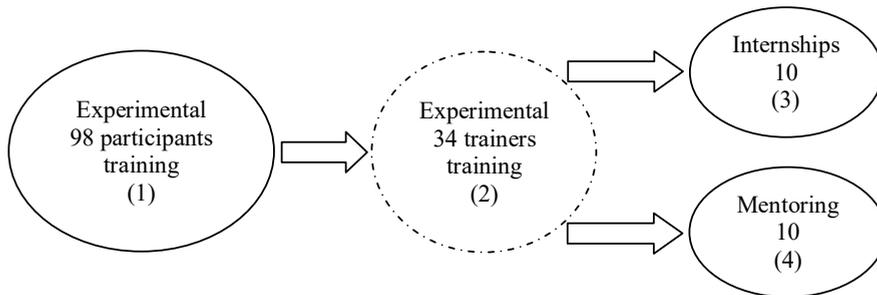
require sustainable innovation in order to trigger higher impact on business performance (Bresciani and Ferraris, 2016).

In summary, however Baumol (2005) emphasises the current view on STEM when he states that the linkages between education, innovation and entrepreneurship are still not well understood in terms of implementing a combined approach. The literature review suggests a combined approach between pedagogical training, leading by example and learning from mentor and experienced entrepreneurs, but also by adventuring into the abyss of each particular new startup and further challenging own's limits.

### 3 Methodology

Our study used online surveys for both participants and the trainers, that included open questions for obtaining qualitative feedback, closed questions for statistics purpose, with a Likert scale for several questions. A set of questions were developed following literature review findings, partner's experience in the field of training, and brainstorming techniques during the consortium meetings, and are presented in the Appendix.

**Figure 1** Project's methodology model



Regarding the participants the areas covered by the survey were: country of training, age group of participants, academic background, information about the project obtained through, prior experience, motivation for training, quality dimensions, interactivity and engagement, learning about company practices, usefulness of programme topics, comprehensiveness of programme, relative appreciation of individual modules, appreciation of individual programme elements and suggestions for changes, perceived effects of participation, overall testimonials by participants.

Regarding the trainers the areas covered by the survey were: country of training, prior experience of trainers, perception of student's interest, quality dimension choice of topics, quality dimension coverage of essentials of entrepreneurship, appreciation of merits of individual modules, verbal assessment of the programme, quality dimension mix of theory and practice, support for business creation, perception of student's reaction to the programme and perceived effects, overall assessment.

Following the answers obtained from all respondents, we performed an analysis on identifying the common findings and we drew relevant conclusions on the training performed.

After all participants attended the theoretical (class), as part of the SCIENT Entrepreneurship Programme, they had the opportunity to participate in an internship activity working in interdisciplinary teams alongside other research students and under the guidance of academic faculty, employers/managers, investors and entrepreneurs. Ten pilot participants from each country visited companies within their own country and another ten visited companies abroad. Specific instructions and guidance for all these stages have been provided in the train the trainers' handbook developed as part of the SCIENT Entrepreneurship Programme. All partners provided a list with key words of the research topic of each participant and they sent those lists among themselves, to find the most suitable company for each person. SPS from Germany was the partner responsible for the organisation of the Internship Activity for all partner countries. After the internship activity was completed, the hosting company and the intern had to complete an online evaluation questionnaire, giving feedback about the internship experience and suggesting ways of improvement. The questionnaire for the survey was developed by ISOB with the valuable contribution of GrantXpert, Fundeun and EUC. The survey was hosted on the Lime Survey-based online-survey system run by ISOB partner.

On the internship survey, the directions of analysis sought were: country of internship vs. country of origin, experience in prior internships, expectations before the internship, quality dimension meeting student's expectations, satisfaction quality dimensions of project, own achievements, most important positive aspects, suggestions for improvement, future contact with host company, and testimonials.

Last, but not least, on the mentorship survey, the directions of analysis were related to the degree of advancement in the business creation and product prototype, besides filling the gaps of the in-class and internship training.

Overall the findings are presented in synthesis in the following part, in a way that combines both quantitative and qualitative results.

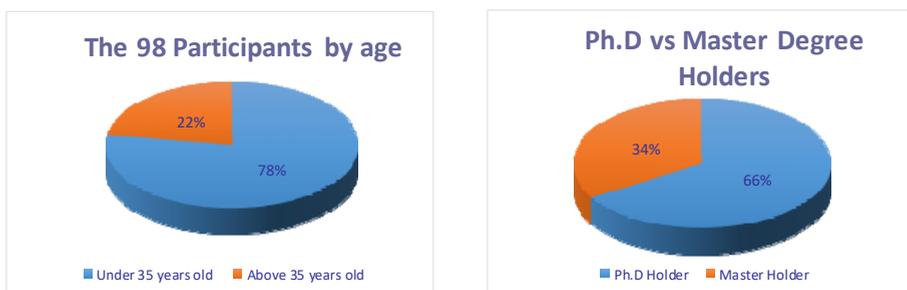
## 4 Research findings

Our findings include participants, trainers, internship and mentorship feedback results.

### 4.1 Participants results

A preliminary analysis of the main findings regarding 98 of the participants that took part in the pilot training program is outlined in Figure 2.

**Figure 2** Participants by age and by degree (survey data) (see online version for colours)



The participants' ages ranged from 35 years old and younger, which is typical for PhD and graduate students. In fact, 78% were 35 or younger, while also some more experienced graduates took part in the trainings. For example, Cyprus and Portugal attracted a significant group of younger participants, while all participants in Italy belonged to the 25/35 group.

Almost 2/3 of the participants either had a PhD or were PhD candidates. Three quarters of the participants had no prior experience with similar programs. The survey examined the following indicators in terms of quality and intensity of the training delivery: the motivation of the participants for their participation in the training program, the interactivity and engagement of the program, the usefulness of the program, the comprehensiveness of the content, which part of the program was more valuable. Also suggestions were made as to what other topics should be added for such training program.

Developing entrepreneurial competences was the main motivator for participation in the pilot training. Some of the participants intended at obtaining primarily knowledge, while others had already a business idea and were looking for ways to implement it in practice. Another reason was the possibility of networking and finding possible investors were also important motivators.

Interactivity and engagement was also used as an indicator of the quality of the program. Almost 70% of the participants agreed strongly that the program was both interactive and engaging with Cyprus, Spain and in the UK scoring the highest score.

Almost 60% of participants strongly agreed that the course managed to familiarise the students with actual practices of real companies. Again, Cyprus, Spain and the UK scored the highest score in this section.

About 75% of the participants found the actual topics chosen for the program to be very valuable while an additional 23.5% found them to be somewhat valuable. Furthermore, almost four out of ten participants felt that the content was comprehensive in the sense that all fundamentals were covered. The program attained a high level of quality throughout the program. All of the individual modules are rated on a level of eight or nine out of ten without much significant differentiation between them.

The topics that students found most valuable, in order of preference, were business model canvas/business modelling, pitching and guest speakers with, group dynamic.

Regarding extra components required, a broad range of suggestions were: to have more guest speakers, more practicing of pitching, organising an additional summer school, direct contact with investors and more time allocation for the program. This is consistent to the literature review findings in terms of combining theory with experimental scenarios and practice.

In terms of improvement of the program the vast majority of the participants did not suggest any changes apart from including more time to practice and shorter sessions over a longer duration. Almost 50% of the participants were inspired by the training to start their own business. For around 10% of students the training helped them to clarify that they do not want to start their own business. Again, the level of impact on the participants was the highest in Cyprus, Spain and the UK. Several reasons mentioned met those of the literature review findings, but the sample per country was not statistically relevant, reason for which we have employed qualitative analysis..

The preliminary conclusions' on participants' feedback on the training can be outlined as follows:

- The program was well received by the overall majority of the participants.
- Students evaluated the program as 'useful, comprehensive, interactive and engaging'. All modules included in the program received more than eight out of ten points.
- Some of the suggestions made by the students included the 'involvement of more business quest speakers, allocate more time for pitching skills, shorter modules over a longer time'.
- Almost half of the participants were inspired by the training to start their own business.

#### 4.2 Trainers results

There were 48 trainers who took part in the study; 71%, respectively 34 responded to the online survey, while 80 % of them agreed that the training material is ready for implementation, with several changes suggested. Their experience ranges from professional qualifications training, academic and business and start up incubators' training, besides being themselves entrepreneurs.

One major concern emerging from this survey was about the level of completion of the training material for future STEM entrepreneurs. The findings were positive, as presented in Table 1.

**Table 1** Training findings per country

<i>Do you think the training material developed is ready for implementation and dissemination?</i>	<i>Cyprus</i>	<i>Italy</i>	<i>Lithuania</i>	<i>Malta</i>	<i>Portugal</i>	<i>Spain</i>	<i>UK</i>	<i>Total</i>
Yes	4	1	0	1	4	3	0	13
	36.4%	20.0%	0.0%	33.3%	57.1%	100.0%	0.0%	38.2%
Rather yes than no	5	2	0	1	3	0	1	12
	45.5%	40.0%	0.0%	33.3%	42.9%	0.0%	25.0%	35.3%
Rather no than yes	2	2	1	1	0	0	2	8
	18.2%	40.0%	100.0%	33.3%	0.0%	0.0%	50.0%	23.5%
No	0	0	0	0	0	0	1	1
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	2.9%
Total respondents numbers and %	11	5	1	3	7	3	4	34
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

- Answers to question: Do you think the training material developed is ready for implementation and dissemination?

Several preliminary conclusions' on trainers' feedback on the training can be outlined as follows:

- The trainers affirmed the merit of the programme by more than 75% in all of the quality dimensions covered, according to the internal evaluation indicator system.
- The mostly quite experienced trainers assess the program as *useful*, *comprehensive*, *motivating* and *engaging*, while the programme was well received by the trainers who delivered it.
- No clear weaknesses or points for improvement stand out in the sense that they were mentioned by a majority of trainers. However, a minority of trainers claims that “the programme as a whole should be ‘fine-tuned’ concerning the technical aspects of the training material and a number of elements that should be expanded, as the involvement of business practitioners, time for practicing and training in pitching skills”.
- Suggestions for alternative structuring of the program (some suggested to use shorter modules over a longer period, while others appreciate the compact format) show that “delivering the course in various formats could further increase the outreach”.
- It was recommended that options for improvement should be discussed in each national pilot testing evaluation programme and that the synthesis pilot evaluation report should suggest a list of common points for final fine-tuning which should be discussed by the partnership as a whole.

The training material suggested in 12 modules indicated in general a good blend of theory and practice and appropriation, with over 70% interesting material and structure.

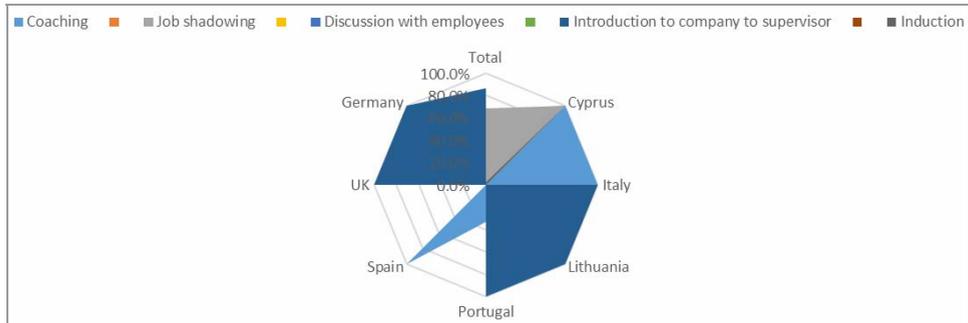
Obviously, several challenges in instructing regarded teaching slides produced by others, duration of the course in terms of keeping the participants engaged all through the day, here suggestions were offered for a lengthier program, adapt the knowledge to their mindsets, give opportunity to expand their knowledge, demonstrate relevance of personal attributes in startups, obtain feedback and engagement. The perception of the trainers about the participants was that “they were very enthusiastic, motivated, passionate and interested about the training, in a context of a comprehensive and dynamic training course, where participants had the opportunity to open their mind towards being able to start a business and improve skills in a professional way in order to become entrepreneurs”.

### 4.3 Internship results

Both the participants and the hosting companies perceived the internships positively. Both mentioned that “the overall quality of the internships has fulfilled the target values set in the evaluation concept” and they highlighted that they will “stay in touch after the end of the project”. Participants mentioned that “they had the opportunity to develop further their networking skills and be exposed on foreign business cultures having insights in new technologies”. Hosting companies highlighted their readiness to assist and mentor promising young graduates as well as networking and expanding their company's network. While the duration of the internships has been limited, many of those companies

who made suggestions for future internships stated that longer internships and a more detailed structure could further enhance the value for both company and intern. Regarding the evaluation of knowledge transfer, as a major element of success in such training, the surveyed showed a focus of high results in Cyprus, Italy, Lithuania and UK, with highly successful modules being presented in Figure 3.

**Figure 3** Methods of knowledge transfer, the following findings emerged per country (survey data) (see online version for colours)



All through the internship period the participants had “the opportunity to discuss and develop further their ideas, to network, to meet other people having the same interest with them, to develop their skills and their knowledge”. The organisation of the internships for the participants was the most challenging activity of the whole project as the majority of the PhD students and graduates were facing difficulties to participate in this activity either at local level or at EU level. Some mentioned that “it was really difficult for them to dedicate time from their studies or from their work for an internship activity”.

#### 4.4 Mentoring results

Each country conducted the mentoring activity more or less in its own way, with either the trainers of the course or with outside dedicated business people, each team benefiting of its own mentor or team of mentors.

One of the major challenge was “to keep the mentees interested, despite a tight working schedule, while another was to deliver the actual business case via a final pitching”.

The topics covered were in a way a review of the training material in the course, but filling in the gaps, especially related to the soft skills, business canvas, the pitching training, the marketing and commercialisation part, the company registration and IPR, and the financial skills, while some even simulated the business case competition.

Despite the described idea generation and refinement efforts, it seemed most students didn't progress to a degree of readiness for commercialisation. They were either entrenched in their ideas, or remained too far away from ideas they could trust to take to market. However, several groups considered seriously starting a company and presented in the local competition and then at the European level competition, which was held in September 2017 in Cyprus.

Gaps from the in-class and internship training were filled to a good degree, i.e., more was done on marketing, more on idea generation, actual brainstorming, company registration steps and documentation, IPR, more on finding investors.

The main challenge was *keeping participants enthusiastic and participative and to attend the regular mentoring hours.*

## 5 Conclusions

Overall, the training programme was highly appreciated by the participants and this is an important conclusion in itself, as it reveals that there is indeed an untapped high quality entrepreneurial resource in PhD STEM students and graduates. Although many of these individuals had little knowledge of business matters, they appreciated its usefulness and the opportunities it provides. The participants affirmed the merit of the programme in all of the dimensions covered. Indicatively, participants assessed it as useful, comprehensive, interactive and engaging. All individual programme modules received evaluations of more than eight out of ten points in all countries.

An important outcome of this study is that the qualitative feedback on this project (verbal comments in free format) validated the positive quantitative ratings. There were just a few clear points for improvement, however there were a number of suggestions that some elements should be expanded in order to further the involvement of business practitioners, and to provide time for practicing and training in pitching skills. Suggestions for alternative structuring of the programme (some suggested using shorter modules over a longer period, while others appreciate the compact format) show that delivering the course in various *customised formats* could further increase the outreach.

Among other general conclusions we have included the following:

- The best way to attract participation is through a blitz of communication techniques, including social media and traditional means. Moreover, contacting key influencers (e.g., professors, deans) helps as well. Most important is personal communication with candidates.
- Scheduling and other organisational details (e.g., breaks, duration of each session etc.) must be *customised*, according to the audience's preferences.
- The strengths of the trainers, guest speakers and the participants must be taken into consideration and utilised in the whole process.
- Local variations (e.g., specific industrial emphases) must not be ignored. In fact they should be used to strengthen the training programmes.
- The stage of development of participants' business ideas is very important and ideally similar; however, training, as it has been structured, can actually combine varying entry level development stages. Nonetheless, the resultant final outcome (i.e., how far each individual's or group's idea has progressed) will be affected.
- Group work should be encouraged further.
- The theory-practice combination is very important. Generally, students prefer the hands-on this-is-how-it's-done approach.

- Though mentoring and internships are key, it is a challenge to arrange scheduling and to find participating companies and individuals. Possibly the best way to approach this is to find tangible benefits for both sides. The team also concluded that internships, due to regulations, even legalities, need to be separate from such programmes. Mentoring should be embodied *within* the training sessions, even though there is an argument that mentoring needs to follow an incubation period, during which participants can better absorb taught material.
- An important objective must be to coordinate the theoretical class with the practical one and the visit of the guest speaker. This way, they all had a major impact in the attendants' comprehension of the project. But this is not always easy.
- The pitching unit needs a more solid foundation, with training in marketing, promotional and selling skills.
- PhD students in non-business areas can get excited about entrepreneurial projects, given the right training.
- Given the amount and diversity of new material, it is a challenge for the participants to absorb and then assimilate it all. Ideally, there should be an incubation period somewhere within the course.
- All modules should have the feel of workshops, with a very real result at the end.

A key conclusion was the necessity to close the gap between industry and academia. Trainers and guest speakers from the field of entrepreneurship should work together to plan and carry out the best learning experience for the participants.

## References

- Baumol, W.J. (2005) 'Education for innovation: entrepreneurial breakthroughs versus corporate incremental improvements', *NBER Innovation Policy and the Economy*, Vol. 5, Bi 1, pp.33–58.
- Boocock, G. and Frank, R. (2006) 'Technology evaluation and commercialization at Loughborough University', *Proceedings of Internationalizing Entrepreneurship Education and Training Conference*, Sao Paulo.
- Bresciani, S. and Ferraris, A. (2016) 'Innovation-receiving subsidiaries and dual embeddedness: impact on business performance', *Baltic Journal of Management*, Vol. 11, No. 1, pp.108–130.
- Breunig, M. (2017) 'Experientially learning and teaching in a student-directed classroom', *Journal of Experiential Education*, Vol. 40, No. 3, pp.213–230.
- Edelman, L.F., Manolova, T.S. and Brush, C.G. (2008) 'Entrepreneurship education: correspondence between practices of nascent entrepreneurs and textbook prescriptions for success', *Academy of Management Learning & Education*, Vol. 7, No. 1, pp.56–70.
- European Commission (2012) *Effects and Impact of Entrepreneurship Programmes in Higher Education*, March, p.87, DG for Enterprise and Industry, Entrepreneurship Unit, Brussels.
- Fayolle, A. (2013) 'Personal views on the future of entrepreneurship education', *Entrepreneurship & Regional Development*, Vol. 25, Nos. 7–8, pp.692–701.

- Ferraris, A., Santoro, G. and Dezi, L. (2017) 'How MNC's subsidiaries may improve their innovative performance? The role of external sources and knowledge management capabilities', *Journal of Knowledge Management*, Vol. 21, No. 3, pp.540–552.
- Jones, B. and Iredale, N. (2010) 'Enterprise education as pedagogy', *Education + Training*, Vol. 52, No. 1, pp.7–19.
- Lackéus, M. (2015) 'Entrepreneurship in education – what, why, when, how', *Entrepreneurship*, 360 Background paper, OECD, France.
- Maas, G. and Herrington, M. (2006) *Global Entrepreneurship Monitor (GEM) South African Report*, Global Entrepreneurship Monitor.
- Markham, S.K., Kingon, A.I., Lewis R.J. and Zapada, M. (2002) 'The university's role in creating radically new products', *International Journal of Technology Transfer and Commercialisation*, Vol. 1, Nos. 1/2, pp.163–172.
- Mihai-Yiannaki, S. (2011) 'Managing change: the private university sector in cyprus, operations within the European context. A case study', *Lex et scientia*, August, Vol. XVIII, No. 1, pp.191–207.
- Mihai-Yiannaki, S. (2012) 'Creativity in business schools – post financial crisis implications', *International Journal of Organizational Analysis*, Vol. 20, No. 2, pp.187–202.
- Orford, J., Herrington, M. and Wood, E. (2003) *Global Entrepreneurship Monitor, South African Report*, GEM [online] [http://www.gsb.uct.ac.za/\\$les/GEM2004.pdf](http://www.gsb.uct.ac.za/$les/GEM2004.pdf).
- Santoro, G., Ferraris, A., Giacosa, E. and Giovando, G. (2018) 'How SMEs engage in open innovation: a survey', *Journal of the Knowledge Economy*, Vol. 9, No. 2, pp.561–574.
- Schoof, U. (2006) *Stimulating Youth Entrepreneurship: Barriers and Incentives to Enterprise Start-Ups by Young People*, ILO, Geneva.
- Shepherd, D.A. (2004) 'Educating entrepreneurship students about emotion and learning from failure', *Academy of Management Learning & Education*, Vol. 3, No. 3, pp.274–287.
- Vesper, K.H. and Gartner, W.B. (1997) 'Measuring progress in entrepreneurship education', *Journal of Business Venturing*, Vol. 12, pp.403–421.
- Volkman, C.K. and Tokarski, K.O. (2009) 'Student attitudes to entrepreneurship', *Management & Marketing*, Vol. 4, No. 1, pp.17–38.
- Wahid, A., Amlus, I. and Norashidah, B.H. (2017) 'The review of teaching and learning on entrepreneurship education in institution of higher learning', *Journal on Technical and Vocational Education*, Vol. 1, No. 2, pp.82–88.

## Appendix

### *The questionnaires for the participants and the trainers*

<i>The qualitative questions for the participants</i>		<i>The qualitative questions for the trainers</i>	
1	Decision – why did you decide to participate to this training?	1	Do you have experience with organizing similar trainings? If yes, which ones? Please explain.
2	Which part of the training did you like the most? Please explain.	2	Which part of the training material (including the exercises) did you like the most? Please explain.
3	Which part of the training did you like the most?	3	What would you like to add to the present training programme?
4	What would like to add to the present training programme?	4	What would you like to add to the present training programme?
5	What would like to change to the present training programme?	5	What would you like to remove/change to the present training programme?
6	If this programme was structured differently, in terms of duration, training days/times, full time or part time, online or face-to-face, what suggestions would you make?	6	Suggestions if this programme could be structured differently, in terms of duration, training days/times, full time or part time, online or face-to-face, what suggestions would you make?
7	In which training topics/areas would you like to receive further training?	7	In which training topics/areas would you like to receive further information/material/additional support to develop your training better?
8	Which entrepreneurial skills do you feel you need to develop further?	8	Please describe the participants' reaction in a few words (enthusiastic, motivated, bored, passive etc.)
9	Testimonials.	9	Effects – what were the main effects that you identified on students during the course implementation?
		10	Suggestions and comments for the training as a whole.