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Perception of Teachers on Entrepreneurial Education Before and After the Implementation of a Pilot Program

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Abstract: Teachers' commitment to entrepreneurial education determines the effect of an intervention program. The objectives of the study, which was conducted in 2019, were both to explore seventy-five (75) teachers' perceptions on entrepreneurial education and ways of implementing it and record the differences through a questionnaire which was completed before and after the pilot program. According to the results, the teachers revealed higher mean values in the post-test, compared to the pre-test values, in all items of the questionnaire, except from the one that concerned their preparation during the university studies. More specifically, the pilot program seems to have broadened teachers' knowledge on entrepreneurial education and skills. They also recognized its value in learning engagement and commitment and selected teachers in elementary education and mathematicians in secondary education as the most appropriate professionals to teach entrepreneurship in school as part of all subjects through activities and Information and Communication Technologies (ICT). Finally, according to the findings, networking and cooperation with the headmaster, teachers' association members, entrepreneurs and parents' and guardians' association can have a positive impact on entrepreneurial education. This study highlights the necessity not only to enhance teachers' knowledge on entrepreneurial education by including it in their undergraduate studies, their in-service training, and the school curricula but also to foster entrepreneurial education at primary and secondary school level.

Keywords: entrepreneurship, entrepreneurial education, teachers, pilot program.

Introduction

Entrepreneurship education is a form of education for students, which aims at developing ideas and turning them into action as well as acquiring skills and abilities (e.g., creativity, innovation, risk-taking) that facilitate the implementation of these ideas (Lindner, 2019; Secundo et al., 2021). EntreComp, a framework launched by the European Commission in 2016, identifies three essential pillars that describe entrepreneurship: “Ideas and opportunities”, “Resources” and “Into action” (European Commission, 2021). The entrepreneurs of the future are at schools today and entrepreneurship education is pivotal in producing successful entrepreneurs.

Many researchers have investigated the focus that courses and programs on entrepreneurship should have, ranging from start-ups, venture creation and business operation (Kassean et al., 2015; Lackéus et al., 2016) until developing entrepreneurial life skills and abilities (Gibb, 2002; Jones et al., 2018). This range also accounts for the confusion that prevails in the literature regarding the variety and content of the terminology on the introduction of entrepreneurship in education, which includes learning *for* entrepreneurship (i.e., acquiring knowledge and competences to turn ideas into reality), learning *through* entrepreneurship (i.e., applying the methodology of entrepreneurial process to achieve learning goals) and learning *about* entrepreneurship (i.e., learning about theories and empirical findings about entrepreneurship and entrepreneurs) (Gibb, 2005). In this study, the term ‘entrepreneurial education’ suggested by Erkkilä (2000) is adopted, which refers not only to a start-up perspective (narrow view) but also to personal development, mindset, skills, and abilities (broad view).

The functionality of entrepreneurial education is better when it is integrated into schoolwork and daily school routine. Moreover, the importance of Information and Communication Technologies (ICT) in teaching entrepreneurial education and its combination with digital education is often highlighted in the literature (Seikkula-Leino et al., 2019).

Since 2015 all United Nations Member States struggle to achieve the 17 Sustainable Development Goals (SDGs) as described in the 2030 Agenda for Sustainable Development that are urgent for peace and prosperity for people and the planet (United Nations, 2015). In the Agenda, entrepreneurship is described as the driving force that can improve the world and the future and address the challenges of our time (Apostolopoulos et al., 2018). Especially, in the post- COVID-19 era all citizens should be equipped with entrepreneurial skills that foster creativity and innovation in problem-solving.

Research Problem

According to research (European Commission, 2021; Seikkula-Leino et al., 2019), teachers seem to lack the appropriate knowledge on entrepreneurial education and how it can be taught. Additionally, most teachers in the European Union lack entrepreneurial education competence due to lack of good-quality teacher training and support, that would develop their entrepreneurial skills and equip them with modern teaching methods and techniques (Hameed & Irfan, 2019). Even though research and literature review emphasize the importance of entrepreneurial education, teachers still miss information on the requirements and other context elements at the micro-level (e.g., pedagogy, didactics, assessment, students, educators, stakeholders and network, online setting, learning space, content) (Thomassen et al., 2020; Tsoli & Babalis, 2021a).

Moreover, according to the systematic review conducted by Jardim et al. (2021), most of the educational programs that study and practice entrepreneurship are implemented in universities, less in middle and high-schools, and even fewer in elementary schools and kindergartens. The research conducted in universities explore mainly social entrepreneurship competency (García-González & Ramírez-Montoya, 2023), the determinant factors of entrepreneurial intention (Fragoso et al., 2020),

challenges and opportunities due to the COVID-19 pandemic (Liguori & Winker, 2020), the impact of programs on entrepreneurial activity (Eesley & Lee, 2020).

Even though research highlights the role of entrepreneurial education in students' development, there is a gap in the context of primary and secondary education on teachers' knowledge, understanding, competencies and skills as well as their adequate preparation and training to apply entrepreneurial education (Colombelli et al., 2022). This study intends to investigate the knowledge and perceptions of teachers in three European countries (Greece, Spain, Portugal) based on 'teachers' voice' and focuses on factors that lead to a successful implementation of an entrepreneurial education.

Research Focus

Based on the above, the present study focuses on the differences between teachers' perceptions regarding entrepreneurial education before and after implementing the pilot program in Greece, Spain, and Portugal. It also examines the extent of teachers' knowledge of the content of entrepreneurial education and the factors that influence its implementation at macro (e.g., government policy, technological development), meso (e.g., discipline, digital tools, university) and micro level (e.g., educators, network, content). It also focuses on the possible enhancement of their knowledge after participating in an ERASMUS+ program, in the context of which a 6-month pilot program, entitled ETHICSBOARD, was designed, implemented, and evaluated in 2019, with the aim to teach entrepreneurship and its' relation to ethics to students between 10 and 15 years old in three European countries, i.e., Greece, Portugal and Spain. Therefore, the main variables of the study are entrepreneurial education and factors concerning its implementation and teachers' perceptions. The current study is of scientific interest, because: a) it suggests ways to implement entrepreneurial education at schools based on 'teachers' voice', b) it provides data that can be taken into account by educational policy and legislation, and c) it may increase awareness of universities to offer compulsory courses focusing on developing students' entrepreneurial competence.

Research Aim and Research Questions

In this quantitative study, pre-test and post-test perception surveys were administered to a group of 75 teachers of primary and secondary education in Greece, Spain, and Portugal to determine the effect of a pilot educational program, called ETHICSBOARD, on teachers' perceptions regarding teaching entrepreneurship in education. The aim of the research was to investigate the impact of the pilot program on teachers' knowledge and perceptions regarding entrepreneurial education (e.g., meaning, entrepreneurship skills, importance, requirements, ways of teaching) and record the differences in two times, before and after the intervention program. The research questions were:

- Which are teachers' knowledge and perceptions on entrepreneurial education with regards to

- 1) the meaning, 2) the entrepreneurial skills, 3) the importance, 4) the requirements, 5) the ways of teaching and 6) the specialties that should be teaching entrepreneurship in education before the implementation of the pilot course (pre-measure)?

- Which are teachers' knowledge and perceptions on entrepreneurial education with regards to

- 1) the meaning, 2) the entrepreneurial skills, 3) the importance, 4) the requirements, 5) the ways of teaching and 6) the specialties that should be teaching entrepreneurship in education after the implementation of the pilot course (post-measure)?

- Are there any differences among pre-measure and post-measure in all the above variables?

Research Methodology

General Background

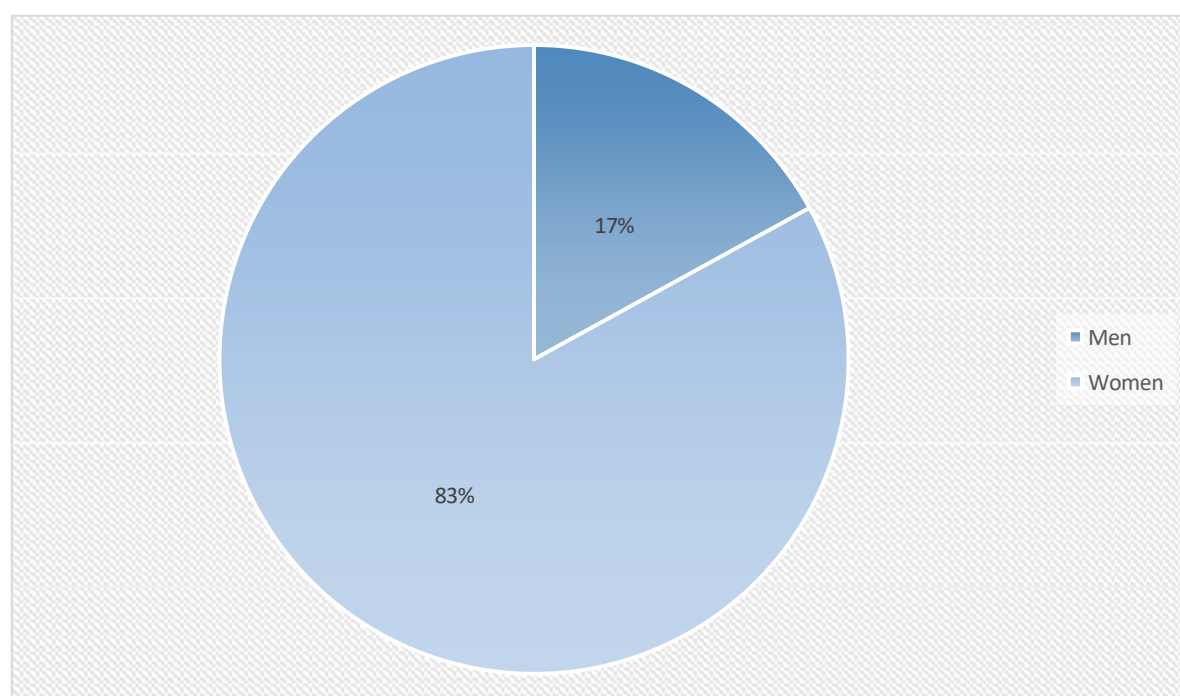
The aim of the present study was to investigate the impact of a pilot program on teachers' perceptions of the importance, the requirements, the appropriate ways to teach entrepreneurship in school and other context elements at the micro-level. A training curriculum on entrepreneurship was developed for primary and secondary school education based on modern and experiential pedagogical approaches, tools, and gamification practices. Moreover, ETHICSBOARD program envisaged two portfolios (teaching and learning), an eLearning platform accessible to students with special educational needs and/or disabilities, a good practice handbook and policy recommendations on teaching ethics and entrepreneurship in school education. Teachers from Greece, Spain and Portugal attended the 'Train-the-Trainer' event in Athens before implementing the pilot program, which gave them the opportunity to discuss and become familiar with the pilot program they eventually applied (Babalís & Tsoli, 2021). Pre-testing and post-testing data was collected after asking participants to complete a questionnaire, which was developed based on the state-of-the-art report, the user needs analysis and general literature review on ethics and entrepreneurship.

Sample / Participants / Group

Seventy-five (75) teachers who implemented the pilot program to school students aged 10 – 15 years old participated in the study.

Figure 1

Teachers' Percentage Based on Their Gender

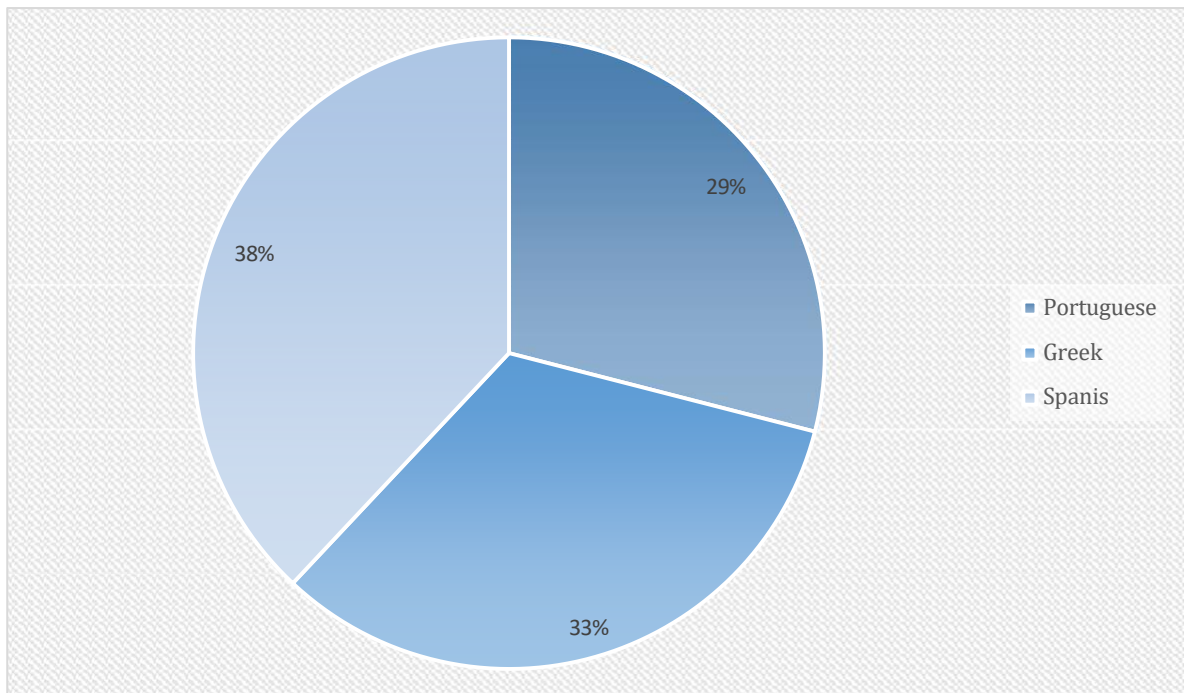


Source: author own development.

Most of the participants were women, i.e., sixty-two (62, 82.7%) and thirteen (13, 17.3%) were men (Figure 1).

Figure 2

Teachers' Percentage Based on Their Nationality

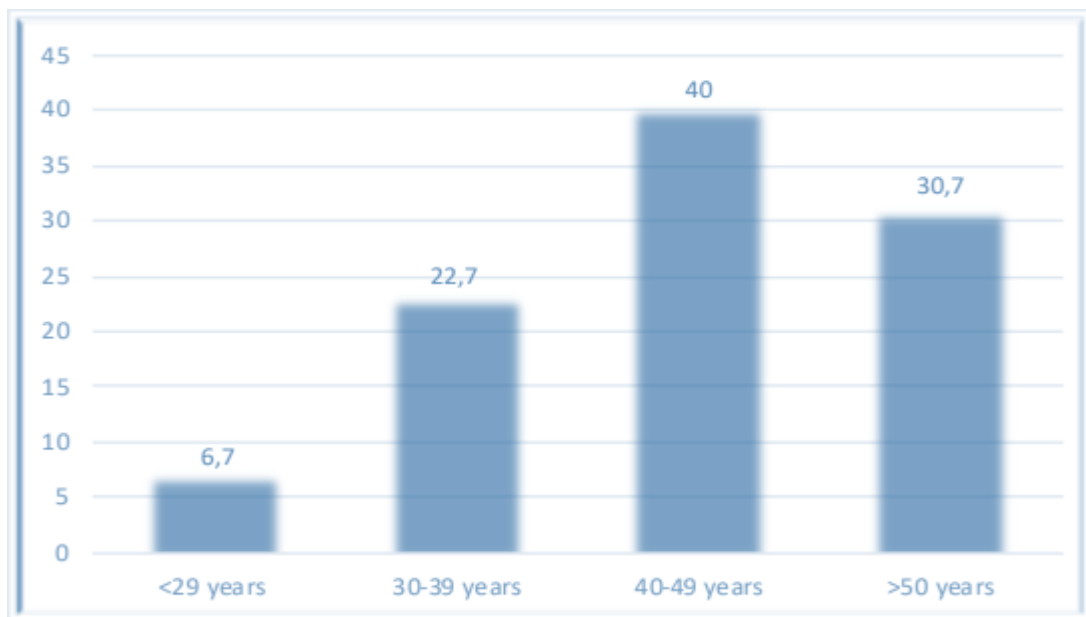


Source: author own development.

From the total sample, twenty-five (25, 33.3%) were from Greece, twenty-eight (28, 37.3%) were from Spain, and twenty-two (22, 29.3%) were coming from Portugal (Figure 2).

Figure 3

Teachers' Percentage Based on Their Age



Source: author own development.

Regarding teachers' age, five (5, 6.7%) were between 20 to 29 years old, seventeen (17, 22.7%) teachers were thirty (30) to thirty-nine (39) years old, thirty (30, 40.0%) teachers were forty (40) to forty-nine (49) years old, and finally twenty-three (23, 30.7%) teachers were above fifty (50) years old (Figure 3).

Instrument and Procedures

Teachers' perceptions were measured via a questionnaire, which was constructed based on the certain theoretical concepts and the empirical results from previous research (Babalís & Tsoli, 2021; Jardim et al., 2021; Kassean et al., 2015; Seikkula-Leino et al., 2019).

Three curricula designed for teachers, students and parents, a teaching and learning portfolio and an eLearning course on ethics and entrepreneurship were developed and implemented by the teachers in the three above-mentioned countries in the academic year 2019. The duration of the pilot testing of pilot program via face-to-face and virtual learning was six months, from February to July 2019. After completing the user needs' analysis, whose purpose was to identify the needs of teachers, parents and entrepreneurs using mixed methods, as well as gathering the expertise already practiced at the partner schools and surveying the state-of-the-art in this area, a questionnaire was constructed as part of the evaluation activity to identify any changes in teachers' perceptions and competencies in engaging with entrepreneurship. The questionnaire consisted of two parts; the first part was concerned with the demographical questions (e.g., gender, nationality, age, total teaching experience, etc.) and the second part was filled with a 10-items-set self-report scale answered through a 4-point Likert scale format ranging from "strongly agree" to "strongly disagree". Each items-set provided 5 to 7 answers that could correspond to teachers' perceptions. Examples of the items were: *Entrepreneurial skills in education are...*, *Education for Entrepreneurship is appropriate to be taught by ...*, etc. The questionnaire was translated into Greek, Spanish and Portuguese, and was distributed to teachers both electronically and printed to complete it in approximately thirty (30) minutes. All ethical principles in research were followed.

Data Analysis

The factor structure and reliability of the questionnaire was acceptable, according to the exploratory factor analysis. The examination of the significant differences between pre-test and post-test was conducted using univariate and multivariate statistical analyses (Wilks' Lambda, F -values, p -values, partial η^2). Follow-up ANOVAs were performed on the subscales where there were significant MANOVA effects (Tukey test). Bonferroni adjustment was applied to control for the inflation of Type I error (Tabachnick & Fidell, 2006). The means (M) and standard deviations (SD) were also examined.

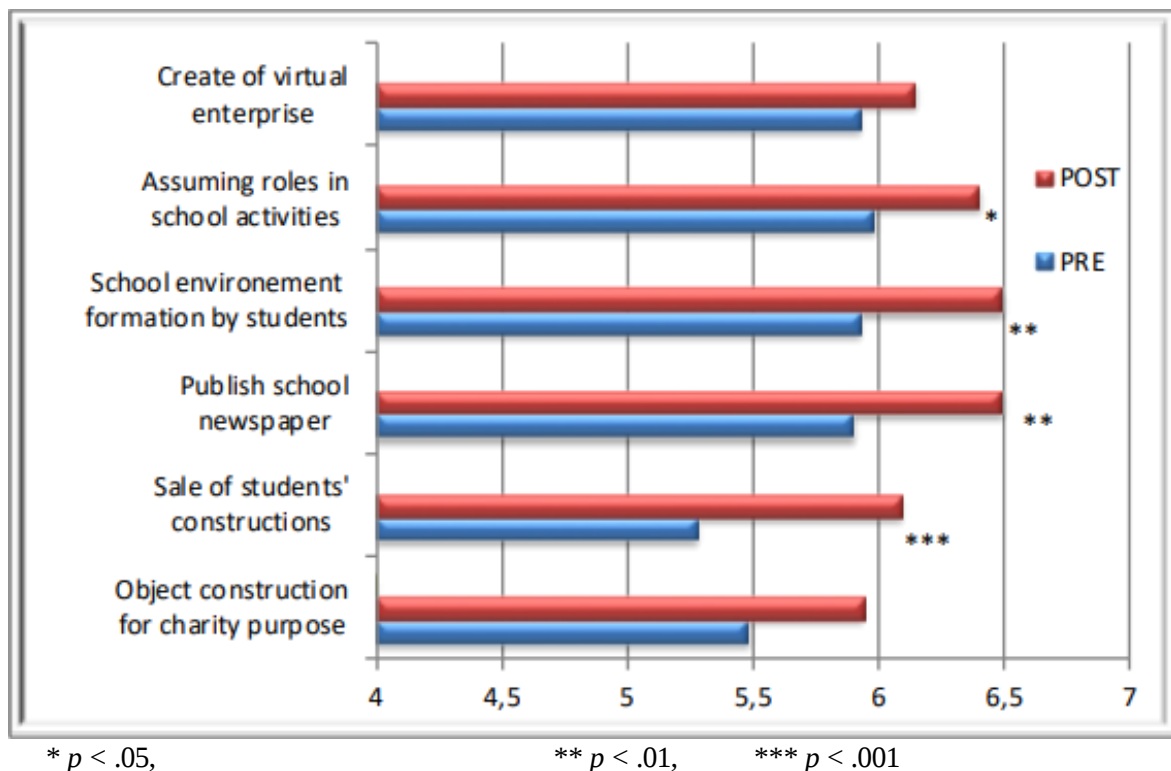
Research Results

Figures 4 to 10 present the differences in the two measures, i.e., before and after the implementation of the pilot program.

In particular, figure 4 presents the means (M), the standard deviations (SD) and the differences (F -values) among pre-measure (before the pilot program) and post-measure (after the pilot program) regarding the meaning of entrepreneurial education. Based on the teachers' responses, the results indicate that after the pilot program the teachers in total showed higher mean values in four (4) statements: 1) assuming roles in school activities, 2) school environment formation by students, 3) publish school newspaper, and 4) sale of students' constructions.

Figure 4

Means (M), Standard Deviations (SD) and Differences (F-values) Among Pre-measure and Post-measure in Teachers Regarding the Meaning of Entrepreneurial Education

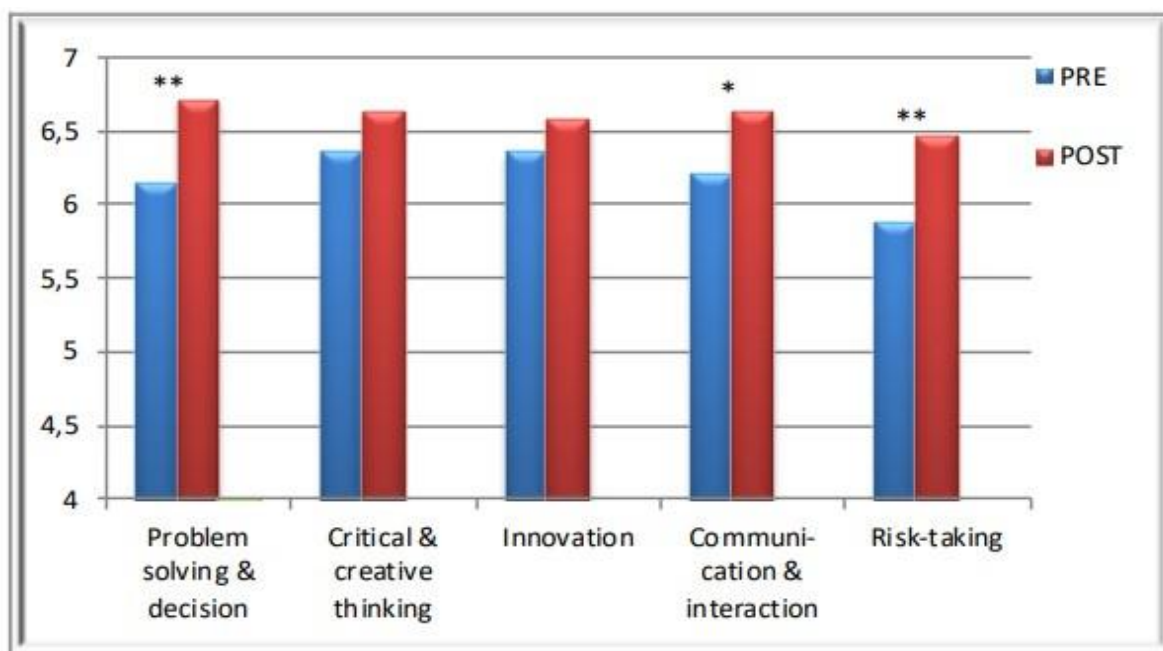


Source: author own development.

Figure 5 presents teachers' perceptions on the entrepreneurial skills in education among pre-measure and post-measure. In more detail, when comparing the post-measure to the pre-measures, it seems that teachers show higher mean values in the following three (3) skills: 1) problem solving and responsible decision making, 2) communication and interaction and 3) risk-taking.

Figure 5

Means (M), Standard Deviations (SD) and Differences (F-values) Among Pre-measure and Post-measure in Teachers Regarding the Entrepreneurial Skills in Education



* $p < .05$,

** $p < .01$,

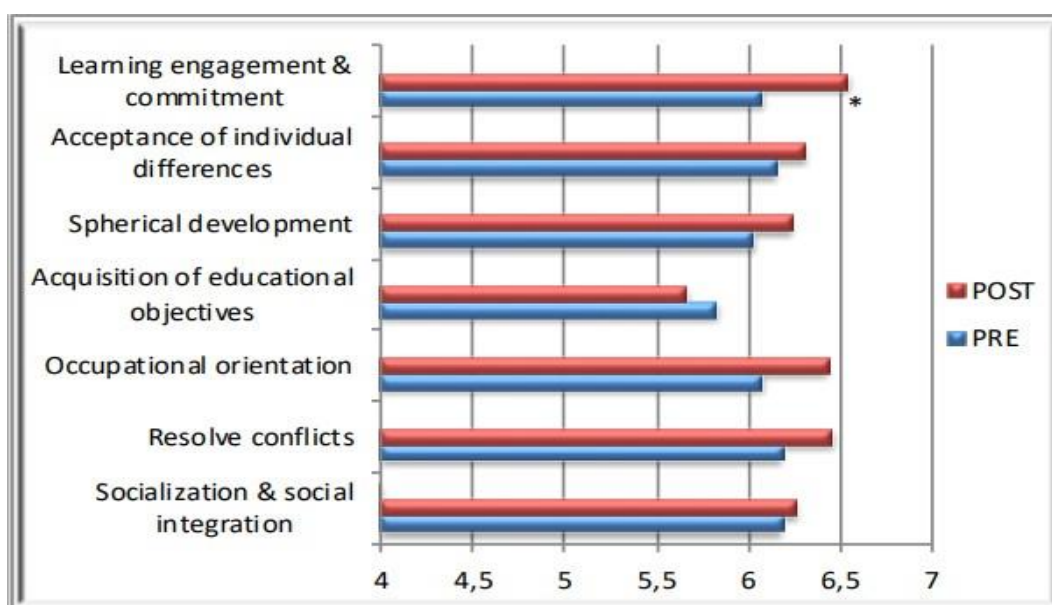
*** $p < .001$

Source: author's own development.

Figure 6 presents teachers' perceptions in Time 1 & 2 regarding the importance of entrepreneurial education. Results among the two measures (before and after the pilot program) showed statistically significant differences in students' learning engagement and commitment in the measure after the pilot program compared to the pre-measure. Nevertheless, all dimensions showed higher mean values as far as the importance of entrepreneurial education is concerned, even though not statistically significant different.

Figure 6

Means (M), Standard Deviations (SD) and Differences (F-values) Among Pre-measure and Post-measure in Teachers Regarding the Importance of Entrepreneurial Education



* $p < .05$,

** $p < .01$,

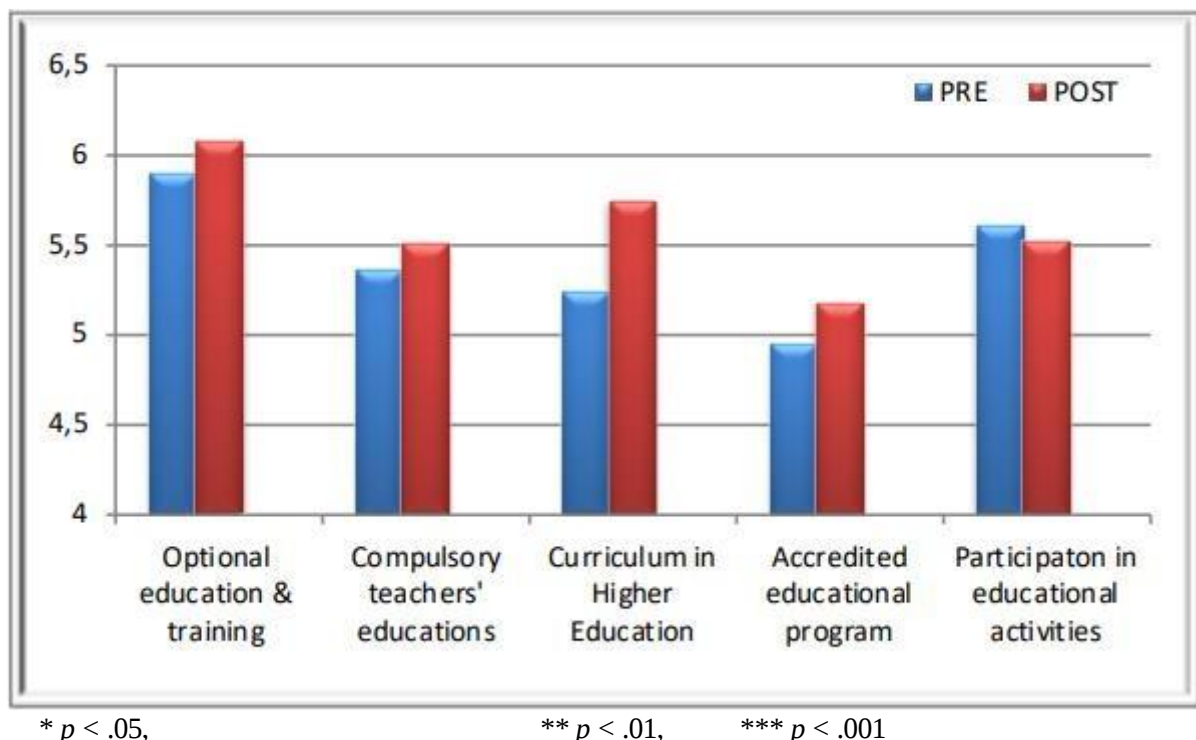
*** $p < .001$

Source: author's own development.

In Figure 7 teachers provided their perceptions with regard to the requirements of the entrepreneurial education. Findings didn't show any statistically significant differences among teachers' responses between pre-measure that took place before the pilot program and after that, in the post-measure.

Figure 7

Means (M), Standard Deviations (SD) and Differences (F-values) Among Pre-measure and Post-measure in Teachers Regarding the Requirements of the Entrepreneurial Education

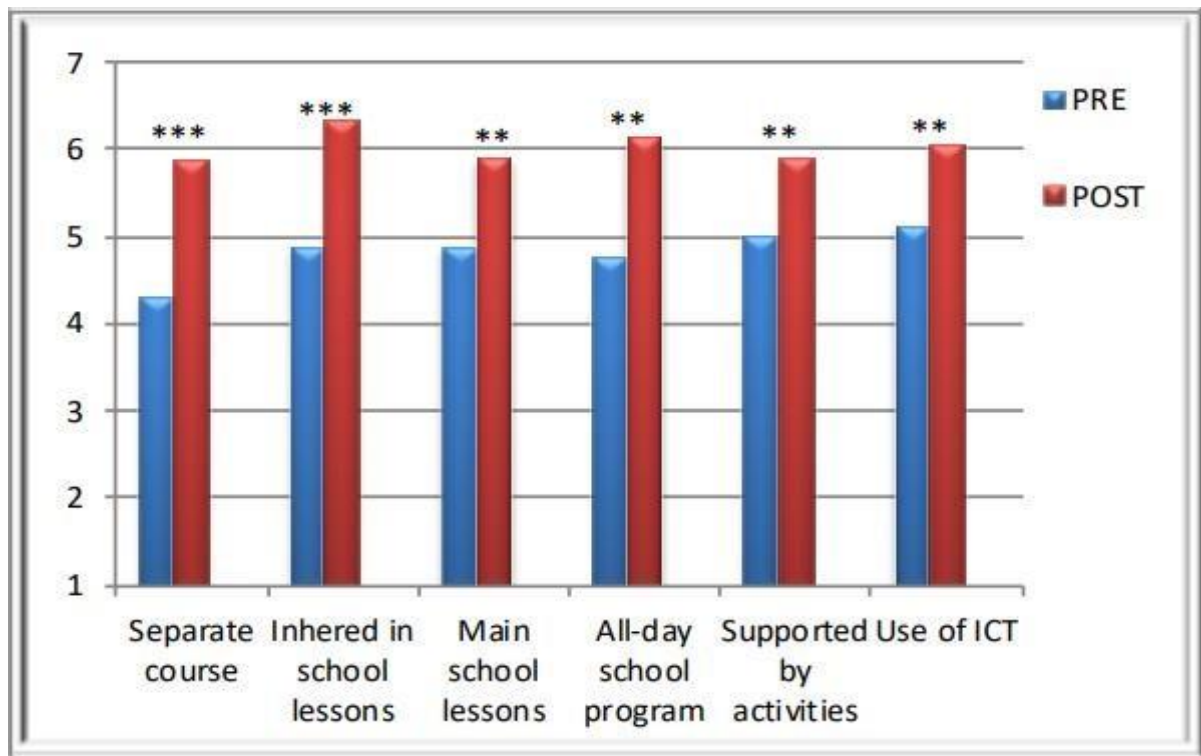


Source: author own development.

Figure 8 presents the differences between pre-measure and post-measure concerning the appropriate way to teach entrepreneurship. The results showed statistically significant differences between the two measures in all items, i.e., 1) teach entrepreneurship as a separate course, 2) inhere entrepreneurship in school lessons, 3) entrepreneurship as a main school lesson, 4) teach entrepreneurship in all-day school program, 5) entrepreneurship supported by activities, and 6) teach entrepreneurship with the use of Information and Communication Technology (ICT).

Figure 8

Means (M), Standard Deviations (SD) and Differences (F-values) Among Pre-measure and Post-measure in Teachers Regarding the Appropriate Way to Teach Entrepreneurship in School



* $p < .05$,

** $p < .01$,

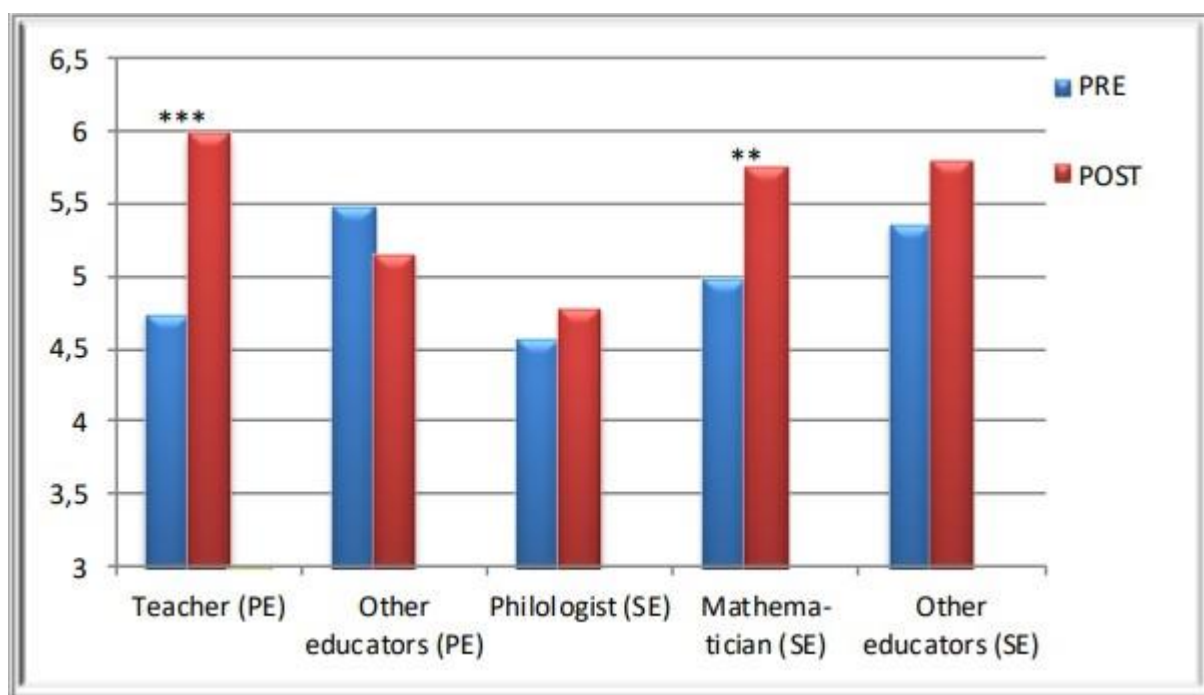
*** $p < .001$

Source: author's own development.

Another important issue regarding entrepreneurial education concerns who is the most appropriate professional to educate students. Figure 9 presents the results, where it seems that in the post measure compared to the pre-measure teachers choose teachers as appropriate to teach entrepreneurial education in primary education, and mathematicians in secondary education.

Figure 9

Means (M), Standard Deviations (SD) and Differences (F-values) Among Pre-measure and Post-measure in Teachers Regarding Who Should Teach Entrepreneurship in School



* $p < .05$,

** $p < .01$,

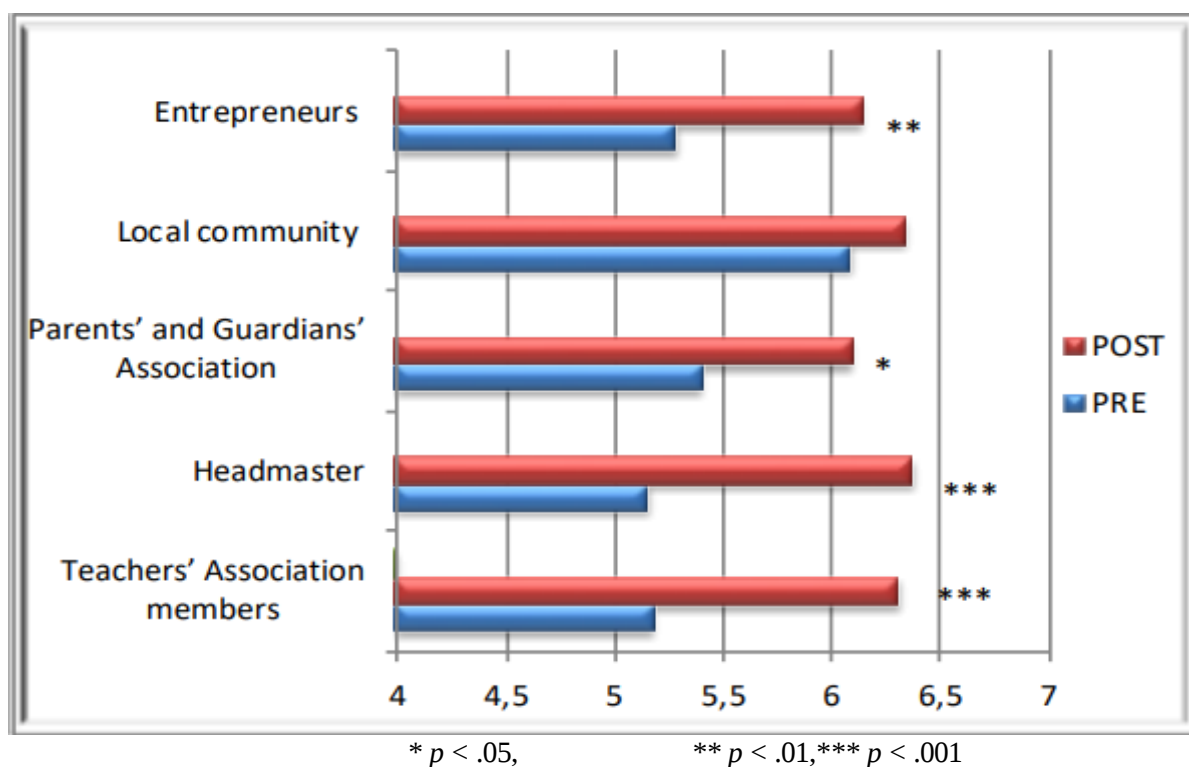
*** $p < .001$

Source: author own development.

Figure 10 presents teachers' perceptions on how to achieve entrepreneurial education improvement. The results showed significant differences between teacher responses before and after the pilot program. In more detail, all items except from local community showed statistically significant differences, indicating that teachers' collaboration with 1) entrepreneurs (e.g., site and school visits), 2) Parents' and Guardians' Association, 3) the Headmaster, and 4) the Teachers' Association members contributes to a quality application.

Figure 10

Means (M), Standard Deviations (SD) and Differences (F-values) Among Pre-measure and Post-measure in Teachers Regarding the Best Ways to Improve Entrepreneurial Education



Source: author own development.

Discussion

This study resulted in statistical significant differences among pre-measure and post-measure with respect to teachers' knowledge and perceptions on 1) the meaning, 2) the entrepreneurial skills,

3) the importance, 4) the requirements, 5) the ways of teaching, 6) the professionals that should be teaching entrepreneurship in schools and 7) the best ways to improve entrepreneurial education. Generally, in the post-measure teachers revealed higher mean values, compared to the pre-test values. More specifically:

It seems that teachers in our sample were not familiar with the width of the content and the range of activities entrepreneurial education may include. Indeed, according to Maritz and Brown (2013), the definitions of entrepreneurial education is not consistent and spans from venture creation to entrepreneurial behaviour. This finding applies for teachers across many other European countries, apart from Greece, Portugal and Spain (Tsoli & Babalis, 2021a). For example, teachers' understanding of entrepreneurial education in UK and Finland was found to be limited to enterprising behavior and did not include the entrepreneurial skills (Seikkula-Leino et al., 2019). Generally, the lack of experienced and qualified teachers who are not really aware of the content of entrepreneurial education is stated in the literature (Akpan, 2021; Garavan et al., 2010; Miço & Cungu, 2023). However, after the intervention program teachers expanded their view on entrepreneurial education and recognized activities, such as publication of a school newspaper or sale of students' construction, as part of this type of education.

Moreover, teachers' responses at post-test showed that they enhanced the list of entrepreneurial skills, including risk-taking, problem-solving, decision-making, communication, and interaction. In their pilot study, which was addressed to 60 students from 5 European countries, who had been attending entrepreneurial education courses, Luppi et al. (2019) also found that their research raised the awareness on communication and teamwork among both students and teachers.

Furthermore, in the post-measure compared to the pre-measure, teachers correlated entrepreneurial education with learning engagement and commitment. Shittu et al. (2021) in their research found that student engagement in entrepreneurial education programs has an effect on entrepreneurial skills growth.

Nevertheless, the pilot-program did not have an effect on teachers' perceptions on the requirements of entrepreneurial education (e.g., compulsory, or optional course in teacher education, design and implementation of a curriculum in higher education).

Moreover, according always to teachers' perceptions, the most appropriate way to teach entrepreneurship is not as a separate course but infused in school lessons as well as in the all-day school program, supported by activities and the use of Information and Communication Technologies (ICT). Other research points out the importance of considering entrepreneurial education as part of all subjects and not as a separated concept (Lindner, 2019). According to qualitative and quantitative data, ETHICSBOARD broadened teachers' knowledge and views, because they could select the appropriate didactic approach to develop students' entrepreneurial skills (Tsoli & Babalis, 2021b; Tsoli et al., 2021).

Teachers believe that the most appropriate professional to teach entrepreneurship is the teacher in primary education and the mathematician in secondary education. This finding reveals teachers' narrow view on entrepreneurship, since a mathematician could develop a good business plan and support the math behind the business (e.g., determine the cost, calculate break even and projected sales, develop pricing strategies, etc.).

Finally, teachers after the pilot program recognized that entrepreneurial education benefits from engaging the headmaster, teachers' association members, entrepreneurs and parents' and guardians' association. Students, teachers, social network and other external stakeholders (i.e., entrepreneurs) exert a strong influence on entrepreneurial education (Neumeyer & McKenna, 2016).

This study implies a need for further research. A more in-depth analysis on the infusion of entrepreneurial education could have value. Additionally, a meta-analysis selecting the studies about how entrepreneurial education is implemented in the educational systems worldwide could be of great importance. Sharing the lessons learned and best practices from these approaches would be valuable.

Conclusions and Implications

This study attempted to identify the differences on what teachers know and how they consider entrepreneurial education before and after implementing a relevant pilot-program in Europe (i.e., Greece, Spain, and Portugal). After conducting pre- and post-tests, the results yielded some interesting findings. Overall, the program had a positive effect on all examined variables. The teachers that formed our sample were not educated enough or at all in entrepreneurial education during their undergraduate studies or as part of their ongoing training. Nevertheless, through the implementation of the pilot-program, it seems that teachers acquired a broader view on the meaning and content of entrepreneurial education, which does not only refer to an enterprise or charity activities, but also to school activities in which students can participate (e.g., publication of a school newspaper, shaping the classroom and school space and physical environment, participating in musical and cultural activities, selling crafts and using the money for excursions, seminars, etc.). Moreover, the pilot program enhanced teachers' perceptions on life skills that are related to entrepreneurship, such as risk-taking, problem-solving, decision-making, communication, and interaction. An important result is that teachers associated entrepreneurial education to learning engagement and commitment. They also identified teachers at primary school level and the mathematicians at secondary school level as the most appropriate professionals to teach entrepreneurship, which should be infused in all school lessons, and not be taught

as a separate course, with the support of the new technologies.

Teacher training, both initial teacher education and continuous professional development, in entrepreneurial education is important, since it can help them better understand its importance, requirements and other practical issues concerning its implementation (Miço & Cungu, 2023; Penaluna et al., 2020).

This study has some limitations. The data was collected from a few schools in Greece, Spain, and Portugal and the number of participants is small; therefore, the results do not necessarily represent the situation and by no means can they be generalized. The questionnaire was self-report and could lead to some bias with teachers, either overestimating or underestimating themselves. Results based on gender, nationality, and age differences was not included in the objectives of this study.

Finally, based on the present study, we could introduce some other recommendations:

- Entrepreneurial education in Greece needs support and promotion by policy makers. It needs to be integrated in the curriculum of all levels of education (primary, secondary, tertiary).
- Students intended for practicing the teaching profession should learn about entrepreneurial education in the context of both teacher initial and continuing training.
- It is important for students, while being trained at entrepreneurial education, to interact with the material, their classmates and their teachers. A variety of methods and techniques are available to teachers to apply, such as experiments, case studies, games, projects, simulations, internships with start-ups, etc.

Suggestions for Future Research

The work reported in this paper provides a good starting point for discussion and opens new future research possibilities that could be beneficial to the field. As confirmed in this study, teachers were not familiar with entrepreneurial education, because either they had not received entrepreneurial education as students, nor had they been prepared during their studies to teach it. Therefore, policy makers should support efforts to increase entrepreneurial education in Greece. Further research on the number of schools and the level of education that entrepreneurial education is being applied, as well as the reasons why teachers promote it or not could help address the obstacles they encounter. Such research will shed light to the role of education in promoting entrepreneurial spirit.

Moreover, this study, as many empirical studies, showed that entrepreneurship can be taught, and relevant educational programs have the potential to develop knowledge, skills and abilities to students as well shift teachers' mindset. However, there is little discussion concerning the reasons why there is still such a residual implementation of entrepreneurial education in compulsory schooling, despite the fact that it is considered as a fundamental competence. In addition, studies investigating the requirements and other general information concerning 'what, who, when, why and how' should teach entrepreneurship are missing and such topics are still not clear to schools and universities. Such studies will help provide further details on questions such as:

- What is entrepreneurship, and what are its effects on personal growth?
- Who should teach it, according to the level of education and the specialty of the teacher?
- When is the most appropriate time for entrepreneurial education to start?
- How can it be integrated (e.g., deeply embedded into the curriculum or as a

stand-alone course)?

Another finding of this study was that the pilot program enhanced teachers' perceptions on life skills that are related to entrepreneurship. Intercorrelations between entrepreneurship and specific life skills (e.g., self-knowledge, empathy, emotion regulation, decision-making, problem-solving, critical and creative thinking) is a suggestion for further research. In this context, research identifying the common personality traits of a successful entrepreneur could enhance the list that has already been derived by the literature.

An important result of this study was that teachers associated entrepreneurial education to learning engagement and commitment. Future research, both quantitative and qualitative, with different or more robust methodology might address this topic more effectively.

Finally, other recommendations for future research, on the occasion of this research but also beyond and above it, could include:

- New Technologies and their implications for entrepreneurship.
- Good practices of entrepreneurial education in different countries.
- Support of entrepreneurial education by agencies and organizations, local or international, public, or private.
- Entrepreneurial education and its contribution to phenomena, such as bullying, violence, social exclusion.

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