ICEE RESEARCH PROJECT ON THE IMPACT OF ENTREPRENEURSHIP EDUCATION

ICEE

Innovation & Research
Entrepreneurship Education

Innovation Cluster for Entrepreneurship Education

ICEE PROJECT PARTNERS:

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Innovation Cluster for Entrepreneurship Education

by

Vegard Johansen

PREFACE

The Innovation Cluster for Entrepreneurship Education (ICEE) project started in January 2015 and ran until January 2018. The project was co-funded by the European Commission through the Erasmus+ programme. The leading partner in the consortium, with responsibility for the implementation, was Junior Achievement Europe (JA Europe). The Eastern Norway Research Institute (ENRI) was leading the research. 14 organisations took part in ICEE:

- the Ministries of Education in Estonia, Finland, Italy and Latvia plus Flanders Innovation and Entrepreneurship (Enterprise Flanders, ministry of Economy, Belgium);
- three research institutes (Eastern Norway Research Institute, The Foundation for Entrepreneurship - Young Enterprise Denmark, Faculty of Economics in Osijek, J.J. Strossmayer University);
- five national JA organisations (in Belgium, Finland, Italy, Estonia, and Latvia).

The ICEE project was a policy experiment. To move towards the European goal that every young person should have a practical entrepreneurial experience before they leave school, the consortium tested what the scenario would look like if 50% of students between 15 and 20 years old had such an experience.

20 upper secondary schools in Belgium, Estonia, Finland, Italy and Latvia participated in a 27-month field trial using mini-companies as the practical entrepreneurial experience. These schools were compared with the situation at five control schools. The research in ICEE was based on a combination of qualitative and quantitative methods. Survey data was gathered pre/post with 12000 respondents (students, teachers, parents, and business people). A total of 150 people was interviewed individually or in groups. In addition to the research, all the ICEE partners worked together in four "cluster areas" to identify good practices on: national strategies; content and tools; teacher training; and assessment.

This research report summarizes some of the results from the research including findings in the ICEE clusters where relevant for the research. The leading partner in the research was Eastern Norway Research Institute with Professor Vegard Johansen as the researcher

in charge. Contributing partners were The Foundation for Entrepreneurship – Young Enterprise Denmark, Josip Juraj Strossmayer University and JA Europe.

We hope that people will read the full report and not just the summary. The main aim of the mini-companies is to enable students to establish their own real enterprise and discover first-hand how a company functions. Mini-companies seem to be a positive experience for most students, while for some it is less so. In a school context, it is important to take into consideration the many and diverse aspects of mini-company participation. Considering the many potential positive effects of participation in mini-companies, the most important lessons from this education policy experiments are:

- Schools must allow for «enough» time to work on the mini-company, and students themselves must be willing to make an extra effort after school.
- A deep dive is much better than a light touch. 100 hours or more of training in mini-companies give better results.

Lillehammer, January 2018
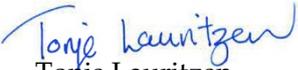
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Administrative Director
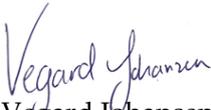
Vegard Johansen
Project manager

CONTENT

SUMMARY OF THE KEY FINDINGS

The Innovation Cluster for Entrepreneurship Education (ICEE) is a policy experiment in five countries and 25 schools. At the centre of it was a mini-company scheme called the JA Company Programme (CP). The data collection in ICEE came mainly through two sources:

- A quantitative study with surveys to students, teachers, parents and business people in Belgium (Flanders), Estonia, Finland, Italy and Latvia. 25 schools participated in the study. The net samples were 7000 students, 3500 parents, 1000 teachers and 400 business people. The data was collected during two school years.
- A qualitative study where 150 people from ten of the participating schools were interviewed in addition to head teachers and representatives from JA and the ministries. The researchers used semi-structured interview guides to both individual interviews and focus groups. Results from the qualitative studies at five schools carried out in 2016 were published in a report in March 2017. Results from qualitative studies at five schools carried out in 2017 were published in a report in February 2018.

Data from ICEE will be used for publishing articles and books, for advising policy makers on how to implement entrepreneurship education, and for improving the mini-company method. The main target group for dissemination are policy makers at the national level (ministries, regional authorities) and those in charge of continuous professional development for teachers and the initial teacher training institutions. The knowledge from the field trials can be used for further implementation of entrepreneurship education in schools; the analyses and models may facilitate the implementation process for those who are playing operational roles (school directors, teachers, NGO partners) and those who are playing supporting roles (parents, private sector partners, members of the local community, media). Finally, and more broadly, we are also concerned with European policy-makers, stakeholders and the public at large.

The research design in ICEE has several advantages compared to previous impact studies on entrepreneurship education (EE) and mini-companies. Some of these are the ability to compare mandatory CP-participants with non-participants, high CP activity to low CP activity, to control for competing explanations of impact, together with large samples with good representativeness for the schools involved. ICEE measures the influence of CP using a pre-post-test design. To document the significance of CP, three groups of respondents are compared: students at test schools participating in CP and their teachers and parents;

students at test schools not participating in the CP and their teachers and parents; and students and their teachers and parents not participating in the CP in control schools and, therefore, not influenced by the project.

It was expected that there would be vast differences between the students in the time spent on CP. CP-students spent an average of 160 hours on CP over approximately 25 weeks (the sum of time spent at school and after school), and this average was about the same in all the countries in the study. 70% of the CP-students spent more than 100 hours working on the CP (high CP activity) and 30% of the students spent 99 hours or less (low CP activity). Thus, we decided to divide the test groups according to time spent working on the CP. One would expect better learning outcomes for those with high CP activity, and we did indeed find that this group was positively influenced by the programme on many dimensions. Those with low CP activity, on the other hand, had no positive significant findings.

The data also allowed us to distinguish between students who take part in the CP as a mandatory activity (83% of CP-participants) and those who take part in it as an optional activity (17% of CP-participants). There were very few differences between these two groups as regards the influence of CP, and therefore it was unnecessary to divide them in the presentation of results. Still, analyses differenciating between the two groups have been conducted as tests of sensitivity of the results.

As regards students in the control group, we expected that there would be some differences between non-participants at test schools and non-participants at control schools. When analysing the data, we found that there were only small differences between these two control groups on learning outcomes. To simplify the analysis, we decided to merge the two control groups into one control group. Thus, in all the analyses of the significance of CP for students, three groups of respondents are compared: students with high CP activity (100 hours or more, 35% of the total sample); students with low CP activity (99 hours or less, 15% of the total sample); and students with no CP activity (50% of the sample). The analyses also checked for the impact of independent variables such as age, gender, immigrant background, parents' background and previous entrepreneurial experiences. The main results for these groups have been reported here. Analyses of ICEE data has also been done at the country level, but to simplify the presentation, this report presents main findings for an aggregated sample. Results for the countries are presented in five separate country reports.

1. Quantity is essential, if practical entrepreneurship projects like mini-companies are to make an impact for the individual and society. 70% of the CP-students spent more than 100 hours working on the CP (high CP activity) and 30% of the students spent 99 hours or less (low CP activity). *Students using more than 100 hours in the CP seem to be positively influenced by this participation, while students using fewer than 100 hours do not seem to be influenced by the participation.* The main aim of CP is to enable students to form their own real enterprise and discover first-hand how a company functions, but students with high

CP activity also seem to be positively influenced in other areas as well. The analyses show that those with high CP activity had significantly higher scores compared to students with no CP or low CP activity on: perceived feasibility for self-employment; project management; sense of initiative and entrepreneurship; and school performance. These results were found both in the mandatory and the optional group. At the same time, those with low CP activity were not influenced by the participation, and were negatively influenced on a few dimensions (e.g. school motivation). There are, thus, two important implications considering the effects. First, schools must allow for «enough» time to work on the mini-company, and students themselves must make an effort to work on their company after school. Second, a deep dive is better than a light touch: working 100 hours or more in the mini-company give better results.

2. There are no negative findings for students with high CP activity. One often-heard concern towards introducing EE in schools is that it may "steal" time from other important work at school. Neither in the qualitative research, nor in the quantitative research, did we find any indications or findings to support this concern for the high CP activity group. In fact, students spending more than 100 hours on the CP seem to improve their performance in other subjects (measured by the Grade Point Average for one school year). They become more knowledgeable about team work, in addition to becoming more entrepreneurial. The report indicates several positive findings for the high CP activity group as compared to non-participants, and it also demonstrates many non-significant relations for those with high CP activity compared to non-participants. It is important that there is not a single negative and significant correlation for this group. The group with low CP activity was not positively influenced on any of the dimensions in the survey.

3. Students provide positive feedback on the CP-method and the learning outcomes.
Focus group interviews with more than a hundred students, teachers and parents provided an opportunity to explore CP and learning outcomes in-depth. First, students appreciated the project time span (one academic year) and the complexity of the work. The students underlined that it takes passion, hard work and long hours to carry out their initial idea, and their level of engagement is high. Second, their autonomy of decision-making developed their teamwork skills, and the fact that the project involved much trial and error made the experience more real. Through their mini-companies, students have responsibility not only to themselves and the teacher, but also to customers, business people and their fellow students. It was regarded as positive by some that the assessment is not necessarily done through grades, but also through competitions, customers, self-assessment and money. Third, teachers, students and parents in all the countries mentioned a wide range of learning outcomes, such as knowledge (how to start and run a company); generic skills (creativity, conflict solving and presentations), and attitudes (school motivation, responsibility, self-efficacy and self-confidence). Both students and teachers mentioned that a by-product of this process, was more students coming to understand the usefulness of the other subjects that they were being taught.

4. Tests of statistical significance show that high CP activity also has a positive effect on variables in other areas than the core purpose, but tests of effect size show that most of these unintended effects are small. This study has a multinational and high-quality research design, and conclusions on CP and its impact on various learning outcomes are based on analyses where we control for relevant competing explanations. Moreover, we use a conservative criterion for statistical significance (0.01-level), and some of the positive effects found for students in this study have also been reported in previous studies of CP using test and control groups. Thus, we are reasonably certain when we conclude that the variables are related. Yet, when the sample is including thousands of students, the difference between the test group and control group can be very small and still significant. In addition to tests of statistical significance, "effect size" is an important tool in reporting and interpreting effectiveness. Having established that 'CP works' (there is an effect), we can ask 'how well does CP work' (what is the effect?) regarding its core purpose and other impacted areas. Cohen's d indicates the standardized difference between two means, and it is reported in all tables as a supplement to tests of statistical significance. The study compares the high CP activity group with the non-CP group, and the calculation of Cohen's d varies between 0.0 and 0.3. These scores were expected since we investigate many variables in other areas than the core purpose. Moreover, ICEE is a large-scale and complex educational intervention, and the combination with a research design carefully controlling for other variables and pre-test results makes it more difficult to get high scores on effect sizes.

5. Most teachers find EE and mini-companies very relevant. The majority of the teachers underline the necessity to focus on methods based on real experience, such as mini-companies. Enthusiastic and competent teachers play a crucial role in the implementation and upscaling of EE. A challenge for upscaling of EE is that most non-mini-company teachers are not familiar enough with the different concepts and working methods related to EE. Teachers require more training to feel competent teaching entrepreneurship, both in the pedagogical process and in the academic content of EE/CP. The majority of the mini-company teachers observed that many students showed noticeable improvement in terms of handling the many project challenges. Teamwork and cooperation skills were among the most important assets, in addition to knowledge on how to start and run a company, and subject-specific learning. In interviews, some teachers pointed out that more girls participated in EE and became the CEO of their mini-company. Still, teachers also pointed out the persistence of traditional gender roles, both in the choice of what the companies produced or sold and the way companies were presented.

6. The relationship between teacher and student seems to shift in positive ways.
According to teachers in group interviews, many teachers and students found themselves on more equal terms through their work with CP, with relationships that are more informal and cooperative in nature. As a consequence of gaining a closer relationship with the students and following their learning processes up close, some of the teachers related to the students in a more respectful way. Some teachers also highlighted the pedagogical

advantages of this way of learning, saying they felt they gained a greater understanding of their students and that it changed the quality of their relationship. Based on observations and meetings with the teachers in the project, the teacher retention rate seems to be high.

7. Most business people and entrepreneurs believe in the importance of EE, and the business sector wants to be more involved in EE. Currently, institutional cooperation between the formal education system and the labour market is weak, and this needs to change. Most of the business people pointed out that schools do too little to ensure access to business people and entrepreneurs who can provide training and support in EE. At the same time, more than half of the teachers argued that business people and entrepreneurs are seldom available as volunteers for training and support. Both teachers and business people recognized that business people and entrepreneurs have adequate competence in EE, while most teachers are less competent. Business people and entrepreneurs have a lot to offer schools regarding EE, especially if they get pedagogical advice on how to approach the students.

8. Most parents have a positive attitude to EE and practical entrepreneurship projects such as mini-companies. The parents of students participating in CP were satisfied with the practical and non-theoretical way of learning that CP represented, but they also reported that they wanted more information about the learning process and the assessment. The parents' generation is often less familiar with the CP's learning-by-doing approach, and they need more information about these principles of teaching. We also learned that parents are not very involved in EE. They could, however, play a much larger role and could become positive drivers for EE in schools.

9. Government priority, curriculum, teacher training and school/business-cooperation are key areas for increasing uptake of EE. Teachers, parents and business people reported that more support from the national government and from teacher education (universities/university colleges) is needed for EE. Moreover, there must be funding to support EE, and EE must be better integrated in the curriculum/subjects. The most important driver is, perhaps, that the majority of all the relevant groups (teachers, students, parents, and business people) believes in the importance of EE. The table illustrates the continuum between drivers and hindrances.

Topic	Driver	Hindrance
Government priority	Some governments (national, local) have made EE a priority, and many school leaders prioritize EE.	Some governments (national, local) have neither made EE a priority, nor provided any funding.
Curriculum	EE is embedded in school documents/curricula in many countries.	EE is not well integrated in the curriculum/subjects, and many teachers find it hard to make enough time for EE.
Teacher training	EE teaching methods are considered effective and academically credible; there is an increasing focus on providing adequate teacher training.	A lack of good-quality teacher training, means most teachers have inadequate competence in EE.
Cooperation between school and business	Business people/entrepreneurs want to bring real-world experience and expertise into the classroom; they can provide competences for EE that many teachers do not have.	Institutional cooperation between the education system and the labour market is weak. Businesses and schools struggle to collaborate effectively.

10. The ICEE project made a substantial impact on the schools` organization and changed teachers` attitudes in some areas. In the project description, the main goal of the ICEE project was formulated like this: "To move towards the European goal that every young person should have a practical entrepreneurial experience before they leave school, the consortium will test what the scenario would look like, if 50% of students between 15 and 20 years old had such an experience". First, the project had a substantial impact on the schools. After ICEE, most teachers at the test schools (both mini-company teachers and non-mini-company teachers) agreed that their school "had a plan for EE", that "EE was an integral part of the school`s ethos and culture", that "there was a leading team that sustained the promotion of EE", that "the school collaborated with local businesses and/or organisations in the delivery of EE", and that "content and methods related to EE were a priority". For all these dimensions, there was a significant change from the pre-results to the post-results for the test group. Teachers at the control schools scored much lower. Secondly, through their role as a CP-teacher, teachers became more positive to EE in some areas. More often than the non-CP-teachers, the CP-teachers agree that EE should be a mandatory part of teacher education, that advanced training in EE should be offered to teachers who have completed their education, that EE is relevant to primary school, that EE should be embedded as a subject in compulsory education, and that EE should be based on real experience. In other areas, there are not significant differences between CP-teachers and the control group, such as: relevance and priority in secondary school; use of EE as an explicit goal in curricula; and integration into existing subjects and interdisciplinary projects. Both teachers in the field trial and teachers in control group have the same opinion on the usefulness of EE in ten different subjects before and after the field trial.

1 RESEARCH QUESTIONS FOR ICEE

The last few decades have seen an increase in entrepreneurship education (EE) at schools, colleges and universities across Europe. A widespread typology distinguishes between three approaches to entrepreneurship education (Scott et al. 1998; Johansen & Schanke 2013). First, *education about entrepreneurship* investigates entrepreneurship as a societal phenomenon. Relating to economy and innovation, this theoretical approach investigates who becomes an entrepreneur, what motivates entrepreneurs, and it analyses the factors influencing entrepreneurial processes. Second, *education for entrepreneurship* is about the acquisition of skills and knowledge of relevance when starting up a new enterprise. Central elements in such teaching include knowledge and training in setting up a budget, a business plan, a strategy for marketing, a plan for organization, as well as reflection on the motives for setting up a business. The third approach, *education through entrepreneurship*, uses the entrepreneurial process as a method or tool to achieve a specific set of learning objectives. These processes vary from concrete entrepreneurship processes aimed at developing an enterprise or working on a case, or participation in activities combining practical and theoretical learning and/or collaboration between schools and working life. The first two approaches (about and for) acknowledge the close connection between entrepreneurship and theories of economic development. The third approach (through) is broader, and it encompasses the competence to perceive new opportunities and making them work in several social areas. The focus of the ICEE project is on the secondary schools, and all three approaches to EE are relevant at this stage of education.

Moreover, EE can be implemented in different ways. It can be taught as a separate subject (compulsory or optional), a part of or a topic within other subjects, and EE can be a cross-curricular approach. Both the ICEE-mapping (ICEE 2017) and the last Eurydice-mapping (Eurydice 2016) demonstrate that the cross-curricular approach is most common in secondary schools in Europe, and here EE-objectives are being transversal and horizontal across different subjects. EE is often integrated by the use of practical entrepreneurial experiences. Such experiences are associated with active learning, experiential learning, activities linking students with the local community or businesses (students going outside the classroom/school or inviting business into the classroom), and project-based learning.

In the initial discussions around the ICEE project, various forms and approaches to EE were analysed. It was decided to focus on mini-companies for several reasons. First, all three approaches to EE (about, for, through) are relevant for mini-companies. Second, the mini-company is already a widespread method, running in most European countries and

has 350,000 students participating annually (JA Europe 2017). Some European countries include mini-companies as an option in their school curricula, and in other countries mini-companies are offered through extra-curricular activities, national programmes or in specific schools. Third, previous impact research has indicated that there are positive indications of the successful achievement of short-term outcomes in attitudes towards entrepreneurship (Peterman & Kennedy 2003; do Paço et al. 2011; Johansen & Clausen 2011; Moberg 2014; Johansen 2016; 2017) and long-term outcomes such as higher start-up rates after participation in mini-companies (Johansen 2010; 2013; Elert et al. 2015). Fourth, the EU goal is that all young people should have at least one practical entrepreneurial experience before leaving compulsory education, and setting up a 'mini-company' is regarded as one of the most effective practical entrepreneurial experiences available for the schools (European Commission 2012; 2014).

Mini-companies combine practical and theoretical learning and stimulate collaboration between school and working life. The largest mini-company scheme is provided by JA Europe (JA Company Programme (CP)). In the CP, students create their own venture following an idea from conception to reality. Working as a team, managing all aspects of the business including raising capital, production, marketing and finance, they culminate the year by participating in regional, national and international competitions. Since there are many guidelines and procedures to the different phases of CP, there is not that much variation in the organization, length and quality of CPs in different schools and between countries.

The ICEE-project includes both qualitative and quantitative research methods; 12,000 people have participated in surveys, 150 people have been interviewed individually or in groups, an unknown number of students have been observed while practicing working on their mini-companies, and several teachers from the field trial schools have participated in workshops. These data enable many different types of analyses, and, hopefully, we can make an important contribution to research on EE and mini-companies.

The main purpose of the ICEE project was to test 50% penetration of a practical entrepreneurial experience in several different schools and in several countries. We wanted to learn what drivers and hindrances impact the achievement of the stated European policy goal, which is that every young person should have a practical entrepreneurial experience before they leave school. The summarizing report will provide short answers to all the research questions raised in the application. The questions are presented in Table 1.1.

Table 1.1: Questions focused upon in the summarizing report

Drivers and hindrances to EE (Chapter 3.1)	Learning outcomes for students (Chapter 3.2)	Effects on the community (Chapter 3.3)
Can we identify in this field experiment important drivers and obstacles in reaching the goal that every young person should have a practical entrepreneurial experience before they leave school? Can we identify important support structures needed to achieve higher penetration of entrepreneurship education in schools? What motivates school owners, teachers and volunteers to join entrepreneurship education objectives and to continue to embrace them? What kind of training and follow up is need for support to teachers? What kind of tools and methods will teachers find useful during the implementation?	Will participating in a mini company in school in the age group between 15 and 20 increase the potential of being an entrepreneur later in life? Will students who participated in a mini company have more knowledge and competences regarding establishing their own company? Will students who participated in a mini company have higher entrepreneurial ambitions? Will students who participated in a mini company have better academic self-confidence? Will participation in an entrepreneurship activity like the mini-company influence on learning in other subjects? Can we find a connection between students participating in the trial and motivation for school? Regarding the mini company experience, can we find connections between the depth (number of hours) of the experience and the learning outcomes?	Can we identify any change in the relationship between the school and the local community among those participating in the field trial? What is the role of the JA organisations' as seen from the school perspective? What were the main drivers / obstacles in reaching 50% penetration as seen from the perspective of the ministry, the headmasters, the teachers and representatives from JA? What are the knowledge and importance of national strategic plans in the school environment and the community connected to the schools?

2 METHODS IN THE ICEE PROJECT

The research included a quantitative study (25 schools) and a qualitative study (10 schools) in Belgium, Estonia, Finland, Italy and Latvia. 12,000 people answered surveys (quantitative research) and 150 people were interviewed individually or in groups (qualitative research).

2.1 Quantitative research

2.1.1 Survey development

Students, teachers, parents and business people participated in the ICEE-surveys. We did 96 surveys ((4 pre-test + 4 post-test) * 2 school years * 6 languages) from 2015 to 2017. The responses to these surveys were eventually combined into 4 datasets (student, teacher, parent, business person).

The questionnaires for students, teachers, parents and business people were developed specifically for this research project. Professor Johansen was responsible for the questionnaires, but many different sources provided input. The questionnaires were developed from February 2015 to August 2015. The students and teachers responded online and during school time. Most parents and business people responded online, but those that did not have the opportunity to participate online could fill out the questionnaire on paper.

In the period February-April, three drafts of the questionnaires were discussed with JA Europe (the lead partner in ICEE). In May, all other ICEE consortium partners gave their input (The Foundation for Entrepreneurship - Young Enterprise Denmark, J.J. Strossmayer University and the five national JA organizations). In May/June, teachers, head teachers and volunteers gave input to some parts of the questionnaires. In June 2015, all questionnaires were pre-tested on the relevant groups (students between 16-19 years of age, teachers, parents and business people). This was to secure that all questions were relevant and understandable. Final adjustments were made, and in July we had an English version of the questionnaire. This version was professionally translated into Finnish, Italian, Latvian, Flemish (Belgium), Estonian and Russian (a second language in Estonia). In early August, all the questionnaires were completed in Opinio (the online survey

programme), and the online questionnaires were tested by academics, teachers, and students in all the countries. Based on their feedback and advice, the researchers adjusted the online questionnaires to achieve the highest possible correspondence between the English version of the questionnaire and the translated versions.

Information letters were sent to students, parents, teachers and business people, and they were also translated to six languages. These letters explained the main purpose of the study, and they also included contact information for the project leader, including an e-mail address and telephone number. It was voluntary to answer the survey, and students who did not participate in the survey, did other school work.

The study was ethically approved by the Norwegian Social Science Data Services (NSD). The study was also cleared with the educational ministries in the five countries and with the management of the schools where it took place. The students, parents and business people gave an active consent by filling out the questionnaire and submitting answers. Parents were informed about the project in writing (information letter) and verbally (school meetings). When the pre-test and post-test surveys were done, and the data was merged into complete datasets, direct personal information was deleted. In all reports and articles from the project, the respondents are anonymous.

2.1.2   Research challenges and solutions

An experiment compares the results obtained from experimental samples against control samples. In a controlled design, the experimental samples and control samples are practically identical except for the one aspect whose effect is being tested. A field experiment applies the scientific method to examine an intervention in "the real world" and thus has the advantage that outcomes are observed in a natural setting. However, field experiments suffer from the possibility of contamination (less control over experimental conditions). Field experiments are increasingly used in studies of education interventions, and this study of the impact of CP endeavours to approximate a field experiment.

Assessments of the effects of education initiatives aim to unravel the counterfactual question: what would have happened to the participants had they not participated in the initiative? A common solution, which we adopted, is to use a control-group design, where a certain number of participants (test group) are compared to non-participants (control group), and this latter group is used as an estimate of the counterfactual situation (Mohr 1995). Accordingly, to limit uncertainty about the potential impact of the CP, the participant test group was divided into low CP activity (30% engaged 99 hours or less in the CP) and high CP activity (70% engaged 100 hours or more in the CP). If the CP has the intended impact on various outcomes, one would expect better learning outcomes for those with high CP activity as compared to those with low CP activity. The control group was

also divided; one group of non-participants came from the test schools, and one group of non-participants came from the non-intervention schools.

In a study of whether or not a given education initiative has effects, there is a risk that self-selection bias could affect the results (Kolvereid & Moen 1997). If students themselves choose whether to participate in the CP, interpreting the direction of the relationship may be problematic: did a previous interest in entrepreneurship result in participation in mini-companies or did participation in mini-companies result in an interest in entrepreneurship? Thus, the ideal plan was to have only mandatory CP-participants and no volunteers. Most of the schools managed to fulfil this criterion, but not all of the schools. However, the data collected in surveys still allowed for a distinction to be made between the students whose CP participation was mandatory (83% of the CP participants) and voluntary (17% of CP-participants).

Even though we managed to "isolate" the impact of participating in the CP and (to some extent) control for self-selection, estimates about the influence of CP participation would still be uncertain if the distribution of students, teachers, parents in the test group and in the control group were skewed. The main problem would be the possible existence of a correlation between factors that resulted in the assignment to either the test or control group and the dependent variable (Wooldridge 2006). Thus, the study controlled for other variables that could influence school performance, by the use of multivariate analyses. Important background variables for the student survey were gender, age, migratory status, parents' education, parents' experience with entrepreneurship, education programme and country. Observations of students from the same school might be dependent, and multilevel regression models have been applied as a sensitivity analysis to account for differences at the school level (Goldstein 2003).

2.1.3   Data collection and sample size

The selection process of the schools was led by the five Ministries in cooperation with the five national JA organizations. The selection of participating schools was based on having a diverse distribution of the following criteria: education programmes (vocational and academic schools), size (small and large schools) and geography (schools in cities and non-urban areas). Some schools had prior experience with CP, and some had not. The test schools also had to commit to increasing the number of students participating in the CP to 50% of a year of students in the school (e.g. if a school had 200 students in each year, 100 students should participate in the CP, and 100 should not participate).

The pre-test surveys began in September and data collection was finished in October. The business people surveys went on for a longer period, as it takes time to recruit volunteers to CP. The data collection for post-test surveys was conducted in May and June. The survey was administered in five schools in each country, and 25 schools in total. Each school

appointed one or two contact persons who were responsible for following up on the surveys. There was a three-step procedure for the data collection. Step 1: The school contact person received an email with an information letter and a "link" to the surveys. Step 2: The school contact person forwarded the e-mail with the information letter and the "link" to the potential participants. Step 3: Potential participants that did not answer the survey received gentle reminders during the data collection period.

Table 2.1: Gross sample, net samples and response rates.

	Gross sample	Pre-test		Post-test		Total response rate
		Net sample	Response rate	Net sample	Response rate	
STUDENTS						
Belgium	1050	987	94	740	75	71
Estonia	800	751	94	565	75	71
Finland	1320	1255	95	790	63	60
Italy	1830	1718	94	1007	59	55
Latvia	2500	2297	96	1900	83	76
All countries	7500	7008	94	5002	71	67
TEACHERS						
Belgium	200	178	89	172	97	86
Estonia	160	142	89	119	84	74
Finland	200	182	91	134	74	67
Italy	420	393	94	303	77	72
Latvia	120	108	90	94	87	78
All countries	1100	1003	91	822	82	75
BUSINESS VOLUNTEERS						
Belgium	100	47	47	27	57	27
Estonia	130	100	77	67	67	52
Finland	200	164	82	64	39	32
Italy	70	58	82	41	71	59
Latvia	100	55	55	32	58	32
All countries	600	424	71	231	54	39
PARENTS						
Belgium	550	427	78	309	72	56
Estonia	300	200	67	99	50	33
Finland	750	599	80	261	44	35
Italy	1300	1140	88	682	60	52
Latvia	1500	1152	77	889	77	59
All countries	4400	3518	80	2240	64	51

The response to the pre-test survey to students was impressive with 7008 students of a gross sample of 7500 students. The response rate at 94% was a credit to the national JA organizations and the school contact persons that managed to include the filling out of questionnaires at schools and during the school time. The post-test also went quite well. We were capable to combine the responses from 5002 students that participated in both the pre-test and post-test. Overall, we are satisfied with a total response rate at 67% (pre-test*post-test). Latvia had the highest total response rate (76%), and Italy had the lowest (55%).

Equal to the student survey, the response to the pre-test survey to teachers was impressive with 1003 teachers of a gross sample of 1100 teachers. The response rate at 91% was a credit to the national JA organizations and the school contact persons. We were capable to combine the responses from 822 teachers that participated in the pre-test and post-test. Overall, we are very satisfied with a total response rate at 75% (pre-test*post-test). The highest total response rate was found in Belgium (86%), and Finland had the lowest (67%).

For the business people survey, the response rate for the pre-test was good with 71%. The gross sample of business people was 600 and 424 of these responded to the survey. We were capable to combine the responses from 231 business people that participated in the pre-test and the post-test. Overall, the total response rate 39% was quite low (pre-test*post-test). The highest total response rate was found in Italy (59%), while Finland and Latvia had very low response rates (32%).

The response rate for the pre-test of the parent survey was very good with 80%. The gross sample of parents was 4400 and 3518 of these responded to the survey. We were capable to combine the responses from 2240 parents that participated in both rounds of the survey. That gives a decent total response rate at 51% (pre-test*post-test). The highest total response rates were in Belgium (56%) and Latvia (59%, whilst the response rates in Estonia (33%) and Finland (35%) were very low.

The next table (2.2) presents some key characteristics of the different samples.

Table 2.2: Key characteristics of the samples (students, teachers, business people, parents), % or mean.

	Students	Teachers	Business people	Parents
Mean age	17	47	42	47
Female	50	72	38	70
Male	50	28	62	30
(Parents) With entrepreneurial experience	32	23		29
(Parents) Without entrepreneurial experience	68	77		71
Vocational programme	35			
Technical/other programme	20			
Academic programme	45			
Non-immigrant	90			76
Immigrant	10			24
High educated (parents)	42			39
Low educated	58			61
High CP activity (100+ hours)	35			
Low CP activity (-99 hours)	15			
No CP activity	50			
Mini-company teacher/volunteer (test group)		22	43	
Teacher/business people with prior experience with EE but not practicing this year (control group 1)		13	15	
Teacher/business people with no experience with EE (control group 2)		65	42	

2.1.4   Types of analyses

Different types of analyses were carried out for the results presented in this report. These include: Principal Component Analysis (finds the underlying structure in the data and reduces the number of variables by lumping together highly correlated variables); Cronbach's alpha (a measure of scale reliability which shows how closely related a set of items are as a group); ANCOVA (assesses whether the means of a dependent variable are equal across levels of a categorical independent variable, while statistically controlling for the effects of other continuous variables (covariates); Cohen's d (the standardised difference between two means); and multivariate regression analysis (used to predict the value of a dependent variable based on the value of two or more other variables). In most cases, the dependent variables are continuous (numeric data on an interval or ratio scale). Linear regressions are used to calculate differences in regression coefficients between the high, low and no CP activity groups. In some cases, the dependent variables are dichotomous (two values). Binomial logistic regression is suitable for predicting the outcome of a categorical criterion variable that can take on only two possible outcomes, and in those cases adjusted odds ratio values (OR) are displayed (when OR is close to 1

there is no specific effect; the higher it is over 1 (e.g. 3), the stronger the positive effect; and the closer it is to 0, the stronger the negative effect). There are many good books and journal articles on methods in the social sciences that cover all (or most) of the techniques used in this research report (e.g. Field 2013).

Most of the tables in chapter 3 present mean results in the post-test, after control for relevant variables such as age, gender, education programme, migratory status, parents` education, parents' entrepreneurial experiences and pre-results. They are rounded to the closest decimal for the sake of simplicity. Differences between the high/low/no CP activity groups are only accepted as probable when results are significant at 0.01-level. Results are "statistically significant" when the probability (p) value is 0.01 or lower, and then there is only a 1% chance of no relationship between CP activity and the dimensions investigated.

Many tables in chapter 3 also present calculations of effect sizes (Cohen's d) after control for relevant variables such as age, gender, education programme, migratory status, parents' education, parents' entrepreneurial experiences, and pre-result. The study compares the high CP activity group with the non-CP group, and the calculation of Cohen's d varies between 0.0 and 0.3. Cohen's d has criteria for 'small', 'medium' and 'large' effects, but findings need to be interpreted by their practical significance, the quality of the study, the uncertainty of the estimate, and results from previous work in the field. With a Cohen's d of 0, 50% of the test group will be above the mean of the control group, and there is a 50% chance that a person picked at random from the test group will have a higher score than a person picked at random from the control group. With a Cohen's d of 0.2, 58% of the test group will be above the mean of the control group, and there is a 56% chance that a person picked at random from the test group will have a higher score than a person picked at random from the control group. It can be noted that ICEE is a large-scale and complex educational intervention, and the combination of a research design carefully controlling for other variables and pre-test results makes it more difficult to get high scores on effect sizes.

2.2   Qualitative research

The qualitative studies in 2016 and 2017 included interviews with students, teachers, head teachers, parents, volunteers, JA representatives, and government representatives. The study in 2016 covered topics such as: hindrances and drivers for EE, preparation and training for the CP, assessment of the CP as a working method, the learning process for students, the relationship between teachers and volunteers, and learning outcomes. In the 2017-study we selected a few areas of interest that we wanted to learn more about and had a special focus on three research questions: Which reflections do teachers have on their role as mini-company teachers? How can mini-company participation increase students' self-efficacy? Are mini-companies a suitable working method for students with special needs?

2.2.1   The informants

The qualitative studies covered half of the test schools. The researchers visited five schools in 2016 and five new schools in 2017. In each country one general/academic school and one vocational school were visited throughout the study. Most of the field trips were done in three days, and they comprised interviews, observations and informal talks. The beginning of the visits would often include a walk around the school premises and informal talks with the school contact person, and at times also the headmaster and the JA coordinator. At some schools, the researchers were welcome to visit the students and observe their mini-company work in action. These observations varied in length, and they were done to get an impression of the location for mini-company work and how the students worked together. Then the researchers would proceed with interviews.

Each school had a contact person that arranged for the interviews. All group interviews were done in a separate room (meeting room), and most often within the school premises. Most of the group interviews included five to six students from different mini-companies. There were also five participants in most of the group interviews with teachers, and we met teachers from various education programmes (vocational, technical, academic) and subjects (economy/business and non-economy/business). The volunteer and parent group interviews were done with three to five participants, and we had the opportunity to talk to parents whose sons/daughters were in different mini-companies. We also did individual interviews with various informants: two students with special needs, five headmasters, five ministry representatives and five JA representatives. In total, we interviewed 150 people.

It must be noted that informants who participated in this study were selected by the schools (and their contact person). The possibility of biased, unrepresentative selections must be considered. In qualitative research, we talk about getting an informative sample of informants (and not a representative sample).

Table 2.3 Overview of the qualitative interviews for both years.

	Informants
Interviews students	55
Interviews teachers	40
Interviews parents	20
Interviews volunteers	20
Interviews headmaster	5
Interviews ministries	5
Interviews JA representatives	5
Sum	150

2.2.2   The interviews

The findings from individual interviews and group interviews will depend, amongst other things, on how the interview is constructed and the questions are designed. A semi-structured interview guide was used for all the interviews. The researchers emphasised open questions and questions that lead to reflection. They also stressed the researchers' external role in the ICEE project and assured our informants that all data would be treated anonymously.

Both group interviews and the individual interviews lasted for approximately 1-1.5 hours, and all the interviews were recorded. There were two researchers in most of the group interviews, and then one researcher led the conversation and the other researcher took detailed notes. There was only one researcher in the individual interviews and for some of the group interviews, and then the researcher focused on leading the conversation.

In-depth interviews were done with various informants, and an in-depth interview is one of the most common methods of data collection in qualitative research.

The focus group method combines elements of interviewing and participant observation. The interview is carried out as a discussion of some questions between the participants, and the moderator is there to help encourage a good discussion. It is a prerequisite that the participants share some mutual understanding of the topic being discussed and, therefore, have something in common. One benefit is that focus groups can uncover the complexity of various situations. Participants are invited to converse around a topic, so that underlying norms, rules, individual attitudes and values come to the surface. Another benefit is that focus group interviews can contribute to increased consciousness and the development of critical reflection around the participants' own practices. A third benefit of the focus group method when doing cross-cultural studies, is the cultural sensitivity it facilitates. It is usually called an 'empowering method' in which the informants have the power to define and explain phenomena, incidents or specific experiences (Vaughn et al. 1996; Wibeck 2007; Massey 2011).

Limitations for both individual interviews and focus groups are the following: the quality of the interview is limited by the recall of the participants, the ability of the participants to articulate their experiences within the timeframe of the interview, and the ability of the researcher to ask the "right" questions to prompt more detailed discussion. An extra challenge in focus groups is that unequal amounts of information will be gained from each informant.

In terms of the students who have mastered mini-companies and their teachers, we have reached a saturation point during the two years of study. Students in the various countries have expressed quite similar experiences and opinions. On a critical note, we could have obtained even more comprehensive data, if we had spoken with more students who did

not master mini-companies very well. The quantitative data tells us that some students (a minority) do not master it well nor like this working-method very much.

The working language in the interviews was English, a second language for both the researchers and the informants. In some of the interviews we used an interpreter, while in other interviews interpretation was unnecessary, since the informants spoke English fluently. The interpreters that we worked with were bilingual and played an intermediary role in the interviews; translating questions in English to the mother tongue and translating responses from non-English speaking participants to English. In the first field trip, we learned that it was an advantage if the interpreter also had in-depth knowledge of EE. In this study, all interpreters had a very good knowledge of EE.

3 EMPIRICAL FINDINGS FROM ICEE

This chapter presents a selection of the findings from the quantitative studies, the qualitative studies and the innovation clusters. The focus is on the statistics. It is divided into three subchapters: drivers and hindrances to EE; learning outcomes (impact of mini-company participation for students); and community effects (impact of participation in ICEE for schools, experiences of teachers, experiences of business people).

3.1 Drivers and hindrances to entrepreneurship education

EE is regarded as an important means for promoting a stronger entrepreneurship culture amongst young people. Both the OECD (1989) and the EU (2014) argue that EE should be included in the educational policies of all countries. Most European countries have some focus on EE and have integrated EE in primary and secondary school, but it is a long way before the EU reaches its goal that all students should have a practical entrepreneurial experience (Eurydice 2016). What is the situation in the five countries taking part in ICEE?

Belgium and Finland have supported EE in national policy documents and have comparatively high proportions of students involved in EE activities. In Flanders, Belgium EE has been addressed in their strategy plan 'Entrepreneurship Education Action Plan' that ran from 2011 to 2014, followed by an updated action plan for 2015-2019. In these plans, EE is explicitly recognized as a cross-curricular objective for secondary schools and embedded as an optional separate subject. Finland had a specific national strategy from 2009 to 2015, the 'Guidelines for entrepreneurship education,' addressing all levels from pre-school to higher education, and EE is also a central topic in many subject courses (Eurydice 2016; ICEE 2017).

Based on information collected in the project, the position of EE in Italy and Latvia is not as strong, but both countries have included EE in their curricula for initial teacher education and for secondary schools. There is no national strategy related to EE in Italy, but the proportion of students involved in EE has increased with the implementation of the "alternanza scuola-lavoro" programme in secondary education. The ongoing strategy for EE in Latvia is set out within the 'Education Development Guidelines,' a general education strategy for 2014-2020. EE is thus integrated into the social sciences and some other

subjects, and an increasing proportion of schools and students participate in mini-company projects (Eurydice 2016; ICEE 2017).

Estonia seems to be situated between Belgium/Finland and Italy/Latvia. They have a specific strategy on EE linked to the national lifelong learning strategy. The EE-strategy covers curricula, learning outcomes, practical entrepreneurial experiences, teacher education and teaching methods. An increasing proportion of schools and students participate in practical entrepreneurship projects such as mini-companies (Eurydice 2016; ICEE 2017).

One of the aims of the ICEE project is to analyse what is needed to increase the penetration of EE in European schools. To do this, we began with an analysis of existing national strategies and identifying various institutions and actors of relevance, as well as central resources and support structures to increase the distribution of EE. This was followed by the survey asking teachers, parents and business people about their views on drivers and hindrances to EE. This type of multinational analysis has not been done before. It should, however, be mentioned that Global Entrepreneurship Monitor annually presents national experts' assessments about entrepreneurship conditions and institutional quality.

Subchapter 3.1 will focus on these research questions

- Can we identify in this field experiment important drivers and obstacles in reaching a goal that every young person should have a practical entrepreneurial experience before they leave school?
- Can we identify important support structures needed to achieve higher penetration of entrepreneurship education in schools?
- What motivates school owners, teachers and volunteers to join entrepreneurship education objectives and to continue to embrace them?
- What kind of training and follow up is need for support to teachers?
- What kind of tools and methods will teachers find useful during the implementation?

3.1.1   Quantitative studies on support structures to increase EE participation

The teachers, parents and business people were presented with this question: What would you say are the three main bottlenecks to increase the uptake of EE in compulsory school? The findings can be sorted into "resources" and "institutions".

Table 3.1: Top three bottlenecks for EE divided by country and survey group - Resources. Teachers (n=1003), business people (n=421) and parents (n=3518). %.

	B	E	F	I	L	All
Teachers						
Lack of time	52	41	46	27	40	41
Lack of funding	35	29	28	46	42	36
Lack of integration in the curriculum/subjects	32	46	29	22	25	31
Business people						
Lack of funding	30	25	40	40	25	32
Lack of integration in the curriculum/subjects	23	34	27	26	29	28
Lack of time	28	17	44	19	24	27
Parents						
Lack of funding	27	45	51	46	48	43
Lack of integration in the curriculum/subjects	22	35	28	28	20	27
Lack of qualified staff	12	15	26	23	23	24

One set of support structures for EE is the available resources. Teachers, parents and business people agree that "lack of funding" is an important hindrance. All three groups also report "lack of integration in the curriculum/subjects" relatively often. Teachers report that "lack of time" is a major obstacle. While business people agree that lack of time is important, while parents place "lack of qualified staff" higher up on the list.

There are also notable cross-country variations. Lack of time was more important in Finland and Belgium than the other countries. Lack of funding was more important in Finland, Italy and Latvia than the other countries. Lack of integration in the curriculum/subjects was more important in Estonia than the other countries.

Table 3.2: Top three bottlenecks for EE divided by country and survey group - Institutions. Teachers (n=1003), business people (n=421) and parents (n=3518). %.

	B	E	F	I	L	All
Teachers						
Lack of support from the national government	16	17	7	28	46	23
Lack of good-quality teacher training in EE at HEIs	23	33	33	15	11	23
Lack of support from the local community (business, NGOs)	16	20	8	26	15	17
Business people						
Lack of support from the national government	23	39	19	45	55	36
Lack of good-quality teacher training in EE at HEIs	21	40	32	26	22	28
Lack of support from the school management	21	36	7	31	26	24
Parents						
Lack of support from the national government	47	54	26	53	62	48
Lack of support from the local government/municipality	42	24	22	33	17	28
Lack of support from the local community (business, NGOs)	10	14	34	34	24	23

The other set of support structures for EE are the relevant institutions involved in EE. The government formulates the national EE policy, and the teachers and students put EE into practice. Teachers, parents and business people agree that "lack of support from the national government" is a major bottleneck for EE. Teachers and business people consider "lack of good quality teacher training at universities and colleges" to be an important bottleneck. Teachers and parents consider "lack of support from the local community (business, NGOs)" to be an important bottleneck. Parents consider "lack of support from the local government/municipality" important, while business people consider "lack of support from the school management" an important bottleneck.

There are also notable cross-country variations. Lack of support from the national government is considered particularly important in Latvia (and Italy and Estonia). Lack of good-quality teacher training in EE at higher education institutions (HEIs) is considered more important in Estonia and Finland than the other countries. Lack of support from the business community was considered more important in Italy than the other countries. Lack of support from the school management was considered more important in Estonia and Italy than the other countries. Lack of support from the local government/municipality was considered more important in Belgium than the other countries.

Moreover, we have also done additional analyses to test whether teachers who had been self-employed had different views than other teachers. 29 tests showed no difference between the two groups. Thus, we can assume that teachers' work-experience as self-employed does not influence their views about support structures for EE.

A final set of analyses investigated whether teachers with long EE experience (4 or more years) had different views on support structures than teachers with no or less experience. On most of the tests (21 of 29 tests), differences were insignificant. The analyses indicated differences in views on support structures between teachers with long experience and those with no experience on eight of the tests. Those with long experience agreed less often that: information about EE is poorly disseminated to schools; EE is not very well integrated in the curriculum; there is a lack of good-quality EE material (practices, guidance, teaching instruments, and methods); the ministry of education does not endorse EE; the local government/municipality has not made EE a priority; most business people and entrepreneurs do not believe in the importance of EE; there is a lack of good-quality teacher training in EE; and schools do too little to ensure access to business people and entrepreneurs who can provide training and support.

3.1.2   Quantitative studies on drivers and obstacles for EE

We wanted to know more about obstacles and drivers to EE in compulsory school, and made a long list of statements in the survey (approximately 30 variables) covering dimensions such as: policy priorities; competence, interest/importance and time for EE among relevant actors; barriers in policy or the law; credibility; challenges to increasing competence. The question was formulated like this: "Please indicate the extent to which you agree or disagree with these statements about obstacles to entrepreneurship education in compulsory school".

About students: Most teachers find that most students are positive towards EE.

About teachers: Most of the teachers and volunteers agreed that *"most teachers have inadequate competence in EE"* and that *"most teachers do not have enough time to engage in EE"*. On the positive side, both volunteers and teachers find that most teachers are supportive and believe in the importance of EE.

About parents: More than half of teachers and parents agreed that *"most parents do not have enough time to engage in EE"* and that *"most parents have inadequate competence in EE"*. On the positive side, both parents and teachers find that most parents are supportive and believe in the importance of EE.

About business people: About half of the teachers and business people agreed that *"most business people and entrepreneurs do not have enough time to engage in EE"* and that *"business people and entrepreneurs are seldom available as volunteers for training and support"*. On the positive side, both teachers and business people find that most business people are competent and supportive to EE.

About school managers: Most business people agreed that *"most school managers have inadequate competence in EE"*, but most teachers disagreed.

About cooperation between schools and businesses: Most teachers, business people and parents agreed that *"institutional cooperation between the formal education system and the labour market is weak"*, and most business people agreed that *"schools do too little to ensure access to business people and entrepreneurs who can provide training and support"*.

About political support: Most of the business people, half of the parents and not very many parents agreed that *"the government has not made EE a priority"* and that *"the local government/municipality has not made EE a priority"*. Most teachers felt, however, that *"there is little funding available for EE"*.

About higher education institutions: Half of the teachers agreed that *"there is a lack of good-quality teacher training in EE"* and that *"there is a lack of good-quality EE material"*.

About EE and school curricula: Half of the teachers agreed that *"EE is not very well integrated in the curriculum"*. On the positive side, only a few teachers agreed that "*there are legislative and/or bureaucratic barriers to make EE widely available"*, *"that EE teaching methods are generally not considered effective"* and that *"there is no academic credibility in EE"*.

3.1.3   Qualitative findings about drivers and hindrances

The qualitative research also investigated obstacles and drivers for increasing uptake of EE in compulsory school. An important point is that factors identified as drivers were often simply the reverse of hindrances.

National governments and their strategies: Several informants mentioned that having a national EE strategy was a main driver for the integration of EE and the CP into the curriculum. Moreover, when EE is a part of the school curriculum, it is much easier for the teachers to implement EE and CP in their respective schools. The actors responsible for these processes are the national governments and national education centres.

Head teachers: The head teachers play an important role in promoting and implementing EE and CP in their schools. Much has already been accomplished, if school leaders understand the importance of EE/CP, and how it can play a role in contributing to a new way of learning. Head teachers serve as important door openers for introducing EE.

Teachers: The teachers play a crucial role in the implementation and upscaling of EE and the CP. Many informants pinpointed that if some teachers at a school are enthusiastic about EE, their interest could spread to the other teachers and the parents. Furthermore, having access to good teacher training is important. Both JA and HEIs play an important role in

educating and supporting teachers. If the teachers lack sufficient EE-training and knowledge, and, in addition, claim that the time allotted for the CP is too limited, the teachers may become major hindrances for EE.

Students: If student experiences are positive, and the teachers and the parents see that EE stimulates young people's knowledge, skills and personal growth, that is also very positive for increasing uptake of EE. Students participating in CP and EE may play the role of ambassadors in relation to the head teacher, the teaching staff and other students. Their enthusiasm depends crucially on whether they get sufficient time for learning and the dedicated support they need.

Volunteers: In some of the countries there are regional business networks, like the YES networks in Finland, the regional development centres in Estonia, and the work-exchange networks in Italy. These networks may serve as drivers to introduce and support EE in the school system. Establishing links between volunteers, schools and providers like JA also seems crucial for successfully implementing EE in the school system.

Parents: Although parents felt very satisfied with the practical and non-theoretical way of learning that EE and the CP represent, they also felt uninformed about the big picture. This includes the learning process and the (presumed lack of) individual assessment. Parents need more information about the CP and the pedagogical platform on which it rests.

3.1.4 Drivers and hindrances identified by the working group on National strategies

The working group (cluster) on National Strategies in the ICEE project was given the task to gather and share information about national plans supporting EE; analyse systemic issues that drive or hinder the success of a plan; and come up with suggestions on how to develop and implement a strategy, and how to review and improve it on a regular basis. The countries involved were Belgium (Flanders), Estonia, Finland, Italy, Latvia, and, in addition, Norway, Croatia and Denmark (ICEE 2017).

A high emphasis on the EE agenda from the policy level and establishing a policy platform are fundamental for creating a strategy on entrepreneurship education. Governments provide the steering documents, recommendations and/or guidelines and thus establish the basic central- or top-level framework to govern the development and the activities. Without such official decisions/structure from the top level, it will be very difficult to establish a unified approach and to have an impact.

All countries highlighted that the collaboration at ministerial level should constantly seek an intensive engagement from the business community and other organisations that can support and strengthen dimensions in EE. Other key players are educational institutions, businesses and private organisations, as well as local and regional authorities.

Across the eight countries, the main implementers of the policies are usually the JA organisations who have an active role in engaging as many schools as possible and linking the activities with the local community. This applies to the eight countries involved in the analysis, but it is also valid in other situations. This network is the largest provider of education programmes for entrepreneurship, work readiness and financial literacy in Europe.

The following dimensions have been identified by the ICEE cluster on National Strategies as being important in any country's efforts to move ahead with entrepreneurship education in a structural and efficient way:

- Provide a broad policy platform for the work and cross-ministerial collaboration
- Agree on a joint and broad vision of entrepreneurship.
- Have strong involvement from the education and business sectors and seek intensive engagement from organisations such as employers' organisations, unions and other national organisations.
- Maintain strong stakeholder relations; create win-win situations, involve stakeholders in designing, planning, implementing and evaluating policy and activity.
- Understand and recognise the key role NGOs such as Junior Achievement can play as entities responsible for implementation and national support.
- Respect the autonomy of educational institutions as long as they comply with national qualification frameworks or steering documents.
- Work from top to bottom (macro) as well as from bottom up (micro), and remember the level in-between (meso), which is constituted by such stakeholders as school principals and school management.
- Implement initiatives at all education levels and in all educational fields through a progression model.
- Acknowledge the teachers' role to function as facilitators.
- Cover entrepreneurship in initial teacher training as well as in continuous professional development.
- Map the spread and measure the impact of entrepreneurship education.
- Build in measures to evaluate and monitor the strategy initiatives and link the strategy to an evaluation plan.
- Create visibility and raise awareness about entrepreneurship education.
- Ensure career guidance for young people who want to realise their entrepreneurial ideas/make start-ups during and after their education.

Based on the experiences from the eight countries involved in the analysis, the development and implementation of national strategies on entrepreneurship education is often a long and slow process. Several challenges lie in their design and implementation, but a deeper understanding about success factors and key elements to consider may help new countries moving into this area.

3.1.5   Attitudes to EE and training in EE

Table 3.3 presents attitudes to different types of EE. Education about entrepreneurship aims at providing knowledge about entrepreneurship as a social phenomenon. Education for entrepreneurship aims at providing knowledge on how to establish a business. Education through entrepreneurship uses entrepreneurial projects as a pedagogical method for teaching and learning. Most of the teachers, parents and business people in the study find all types of EE important (74-81%). Generally, all groups and countries favour EE, but there are some groups that find EE less important than the others: parents in Belgium and Latvia; business people in Latvia; and teachers in Italy.

Table 3.3: Percentages reporting that various types of EE are important. Teachers (n=989), business people (n=419) and parents (n=3418).

	B	E	F	I	L	All
Teachers						
Education about entrepreneurship	77	77	83	59	79	75
Education for entrepreneurship	72	82	74	62	83	75
Education through entrepreneurship	74	82	76	57	86	75
Business people						
Education about entrepreneurship	79	83	89	75	65	79
Education for entrepreneurship	82	74	83	90	70	80
Education through entrepreneurship	74	87	82	84	76	81
Parents						
Education about entrepreneurship	60	81	89	75	65	74
Education for entrepreneurship	66	83	90	80	72	78
Education through entrepreneurship	58	79	81	78	69	73

In the sample of mini-company teachers, 32% had no teacher training in EE. 44% of the mini-company teachers had received training by JA for the CP, 25% had received training by JA for EE in general, 20% had received training by a university, and 14% had received other training. In the control sample, 70% had no teacher training in EE. 4% of the non-mini-company teachers had received training by JA for the CP, 4% had received training by JA for EE in general, 11% had received training by a university, and 15% had received other training.

3.1.6   Assessment of the JA Company Programme

About 90% of business volunteers would be pleased to volunteer for CP again, and about 80% of CP-teachers would like to teach CP again. Moreover, more than 80% of volunteers would be likely to recommend the CP to other business people, and more than 60% of teachers would be likely to recommend the CP to colleagues. To understand what

motivates teachers and volunteers to continue with CP, we asked a series of questions on how they assessed CP and how it can be improved.

Both business people and teachers were also asked about their opinion on the students and their participation in CP. Most business people and teachers found that the students "enjoyed combining theoretical and practical work", "found the mini company project challenging", "enjoyed the tasks they did in the mini-company", "worked extra hours on their mini companies", and "enjoyed working on the mini-company."

Most of the CP-teachers and volunteers reported that the CP is an effective teaching tool, and that they were satisfied with CP as an educational method. Most teachers and volunteers found that the goals of CP are well defined and articulated, and that concepts are explained clearly and effectively.

Working with the CP, most teachers and half of the volunteers were satisfied with what JA organisation had to offer (trade fairs, competitions, website, guidance from JA throughout the programme implementation, and the role as an intermediary between schools and businesses).

About half of the teachers and business people experienced that the volunteer role is well defined, that the teaching material was of high quality, and they were satisfied with the teacher/volunteer training before the programme implementation. While most teachers found the teacher role well defined, only half of the business people found it well defined.

In the qualitative research, we were interested in discussing some of the experiences and challenges with CP, and the following areas were highlighted; training, time, relations, reflection on practice, the role of the school administration, and communication.

Training: Among the teachers there is a wide range of experience with regard to preparation and training for EE and the CP. Teachers with long practical experience that had studied EE at university and also received basic CP-training (and follow-up courses) from the JA organisation, were particularly confident. The newcomers to the field felt they had inadequate training for the responsibility of leading their students in the CP. They called for more training to be able to feel competent both in the pedagogical process and in the academic content of the CP.

Time: CP is a time-intensive working method, and teachers and students have worked much more than the time allotted by the CP. One thing is that this requires them to use their free time. Another thing is that the time set aside to integrate CP into the various subjects at school has in some cases been too limited. It is important to discuss and eventually expand the timeframe for CP, and to connect CPs even closer to competence aims in specific subjects.

Relations as seen from the students: The success of the CP partly depends on a good relationship between the students and the teacher and/or the volunteer. In cases where the teachers lack skills and experience, the volunteers assume a more important position. The teacher and the volunteer both seemed to play the role of tutor and helper, and there was little contact between them. If the teachers are less involved than the volunteers, there may be challenges for the teachers in assessing and monitoring the students' learning process.

Relations as seen from the teachers: Several teachers expressed that they find it meaningful to be on an equal footing with their students in the cooperative nature of mini-companies. They enjoy learning together with and from their students. In addition, teachers describe that the students can better show their individual strengths through CP, when the teacher acknowledges and sees the individual.

Reflection-on and in-action: Organized knowledge-sharing can enhance teachers' awareness about why students succeed or are challenged by CP work. The teachers recount that they find it useful to share positive and challenging practical experiences with other teachers and to have time to reflect upon it. In some of the countries, the teachers worked in teams and felt that the support they got from this teamwork was a big asset.

School administration: It is important that teachers experience the school administration as supportive, because teachers have different backgrounds and motivations for working with CP. Several teachers describe how they experience increased motivation and mastery by having appropriate areas of responsibility when working with CP.

Communication with parents: It is important to communicate the educational principles that underlie the CP's learning-by-doing method and the assessment system. Some parents call for clearer learning goals and assessment criteria. They feel they have little control over what their children must learn, how they learn it and when, and they ask for more information about these principles of teaching.

3.1.7   Replies to research questions

Can we identify in this field experiment important drivers and obstacles in reaching a goal that every young person should have a practical entrepreneurial experience before they leave school? Several drivers and hindrances were identified in the Innovation Cluster on Entrepreneurship Education. Some of the drivers and hindrances were specific for each country, but there were also similarities between the countries investigated. Some of the success factors for countries with a strategy on EE implemented over some time were:

- Close cross-ministerial cooperation and a specific focus on EE
- Strong cooperation between the education and business sector

- Engagement from employers' organisations, unions and other national entities
- Key role of NGOs like Junior Achievement

The surveys to teachers, parents and business people highlighted these <u>obstacles</u> to increasing uptake of EE in compulsory school?

- Most teachers have inadequate competence in EE, and there is a lack of good-quality teacher training in EE.
- Most teachers do not have enough time to engage in EE.
- Institutional cooperation between the formal education system and the labour market is weak, and business people and entrepreneurs are seldom available as volunteers for training and support.
- Lack of funding, and that governments (national, local) in some countries have not made EE a priority.

The surveys to teachers, parents and business people highlighted these <u>drivers</u> to the increasing uptake of EE in compulsory school?

- Most of all relevant groups (students, teachers, business people and parents) believe in the importance of EE.
- EE is embedded in school policies/curricula, and EE teaching methods are considered effective and academically credible.
- Business people/entrepreneurs are considered as competent in EE, and some of them want to push for greater access to schools, so they can provide training and support.
- Governments (national, local) have made EE a priority, and many school managers seem to prioritize EE.

Can we identify important support structures needed to achieve higher penetration of entrepreneurship education in schools? From the point of view of teachers, parents and business people, more support from the national government and from teacher education (universities/colleges) is needed. Moreover, there must be funding to support the uptake of EE, and EE must be integrated into the curriculum/subjects. Work-experience outside the education system did not matter to teachers views on support structures, but teachers with long experience in EE had different views than those with no experience on some dimensions. It must also be noted that there are cross-country variations: some countries point to lack of good-quality teacher training; other countries pinpoint lack of support from the business community or from the school management; and some report lack of support from the local government/municipality.

What motivates school owners, teachers and volunteers to join entrepreneurship education objectives and to continue to embrace them? From the ministries' point of view, EE is regarded as an important means for promoting a stronger entrepreneurship culture amongst young people. The implementation of EE must be understood in light of

high unemployment among young people and structural changes in professions and economic frameworks. In addition, ministry representatives see an impact from EE with respect to the students' generic skills and attitudes. Some of them believe that EE can be a means to improve collaboration between schools and local communities, and that local businesses and other organisations can contribute more to schools and community activities.

If the headmasters are dedicated to EE, the incentives are strong to get it implemented. Headmasters that are positive to EE pinpoint various motives for their attitude. Some headmasters point to learning outcomes for students, such as teamwork or personal growth. Other headmasters find that many teachers are enthusiastic and that student-teacher relations may improve. Some headmasters argue that students need to know more about their community, their region and their country and what challenges are ahead, and that EE and CP is one way to provide such information.

The CP-teachers and volunteers report that CP is an effective teaching tool with clearly defined goals, and they consider that CP is a good educational method. CP-teachers and volunteers with a positive view on CP, find that most students enjoy working with the CP, and they are motivated by the learning outcomes for students. Most teachers report that CP improves skills and competencies, such as decision-making skills, negotiation skills, commitment competencies, ability to coordinate activities, presentation skills, sense of initiative, creativity, problem-solving skills, team work skills, and planning skills. Most of the business volunteers also report that it is important for compulsory education to help students develop skills and approaches that foster entrepreneurship, innovative thinking and economic/financial understanding.

What kind of training and follow up is needed for support to teachers? Most of the mini-company teachers had received training in EE/CP before they were to implement CP, while most of the non-mini-company teachers had not received such training. Teachers with EE-training and long practical experience were confident, whilst the newcomers called for more training both in the pedagogical process and the academic content of EE/CP. Considering the latter, it seems that teacher training in education about, for and through entrepreneurship are equally important, as the same proportion of teachers find the various types of EE important.

Throughout the CP-implementation, it is important that the JA organisations support the teachers and guide them through the process. JA also plays an important role as an intermediary between schools and businesses volunteers, and the results indicate that it is important for teachers to better understand the role of the volunteers and vice versa. Some teachers want to link the CP closer to competence aims in the subjects. Finally, many teachers in the qualitative interviews called for more cooperation and knowledge- sharing between teachers. Such organized knowledge-sharing can enhance teachers' awareness about why students succeed or are challenged by CP work.

What kind of tools and methods will teachers find useful during the implementation?
The survey results told us that most CP-teachers would like to do the CP again and to recommend it to colleagues. The survey also demonstrated that most teachers report that it is an important task for compulsory education to help students develop their creativity, problem-solving skills, power of initiative, and planning skills. Five of six teachers also find it important for students to gain knowledge about the labour market and employment, and three of four teachers find it important for students to gain knowledge about how to start and run a company. These findings give some further indications about what training and skills to be aware of in teacher training.

Moreover, the innovation cluster on Content and Tools recommended the implementation of a progression model on EE, and they also delivered a How-to Manual for Teachers. This is a document that educators can use to better understand how to implement entrepreneurship education programmes in the classroom. Among other things, the cluster group recommended that:

- EE-tools available for teachers should be easy to implement and be accompanied by quality assurance instruments.
- EE should be focused on learning-by-doing, be practical and linked to the world of work, and the business community should offer volunteers.
- The use of blended learning (combining face-to-face and online learning) can help to increase student motivation and to simulate real-life situations.
- A space where teachers can access new tools and programmes, share their experience and learn from their peers from across Europe is highly recommended.

3.2   Learning outcomes (CP and students)

A key aspect of previous research into mini-companies is studies that investigate young people's intention to become entrepreneurs, their knowledge about business development and the establishment of businesses. Some policy documents and journal articles present suppositions about the advantages of EE that have not been the subject of much research, such as educational motivation and performance (e.g. Volkman & Tokarski 2009; European Commission 2010). The ICEE project looks at possible connections both between mini-companies and generic competencies and more specific entrepreneurial competencies.

Students with high CP activity (100+ hours, 35% of the sample) are compared with students with low CP activity (-99 hours, 15% of the sample), and students with no CP activity (50% of the sample). Please note that there were no significant differences between the two control groups (students with no activity in the test schools and control schools), and therefore these two groups have been merged to one group called "No CP activity". Moreover, there were few (and small) differences between mandatory CP-participants and voluntary participants, and, thus, a distinction between the groups is not needed in the

presentation. The differences in scores (coefficients) between high, low and no CP activity, controlled for other relevant variables, are used to estimate the effect of CP.

As mentioned in the methods section, this project covers 25 schools in five countries over two years, and that points to a lot of possible variability in the analysis. There are bound to be differences between countries, schools, time-points and even classes and teachers, but to make the report more readable, the analyses presented are on the aggregated sample. Subchapter 3.2 will focus on these research questions:

- Will participating in a mini company at school in the age group between 15 and 20 increase the potential of being an entrepreneur later in life?
- Will students who participated in a mini company have more knowledge and competences regarding establishing their own company?
- Will students who participated in a mini company have higher entrepreneurial ambitions?
- Will participation in an entrepreneurship activity like the mini-company influence learning in other subjects?
- Can we find a connection between students participating in the field trial and motivation for school?
- Will students who participated in a mini company have better academic self-confidence?
- Regarding the mini company experience, can we find connections between the depth (number of hours) of the experience and the learning outcomes?

3.2.1   Self-employment

There is a quite rich and unwieldy amount of literature regarding self-perception, attitudes and behaviours tied to entrepreneurship. A series of different measurements exist, and it is common to distinguish between perceived wish, feasibility, capacity, intentions, etc (Lautenschläger & Haase 2011). Some previous studies have focused on the short-term effects of CP related to self-employment. An Australian study with 224 students concluded that CP-participation increased the perceived desirability and feasibility of entrepreneurship for participants (Peterman and Kennedy 2003). A Portuguese study with 74 respondents argued that CP contributed to the development of entrepreneurial competences and start-up activity (do Paço et al. 2011). A study from Norway with 1400 students concluded that CP stimulated start-up intentions (Johansen and Clausen 2011). Another survey conducted in Norway with 1,160 students (17-18 years of age) indicated differences between young men and women: CP positively influenced skills and knowledge and the perceived feasibility of self-employment for men and women; but CP did not influence preference for self-employment or the perceived desirability of self-employment among men, only women (Johansen 2016; 2017). Moreover, in a study of 250

students in the Netherlands, the expected influence on students' entrepreneurial skills and entrepreneurial intentions failed to appear (Oosterbeek et al. 2010).

Table 3.4 Comparing High-CP (100+ hours), Low-CP (-99 hours) and Non-CP (0 hours) and self-employment, using Cohen`s d and ANCOVA. The analyses control for age, gender, education programme, migratory status, parents` education, parents` entrepreneurial experiences, and pre-result (*<0.01-level). Scales from 1 (low) to 5 (high).

	Cohen`s d	ANCOVA		
	High-Non	No CP	Low CP	High CP
*Perceived desirability for self-employment	<0.1	3.3	3.3	3.4
*Perceived feasibility for self-employment	0.28	3.1	3.1	3.3
Entrepreneurial intention	<0.1	3.0	3.0	3.0

* = significant correlation at 0.01-level

High = 100+ hours CP, Low = -99 hours CP, Non = No CP activity

Previous studies have confirmed that perceived feasibility and perceived desirability are some of the main factors explaining entrepreneurial intention (Krueger 1993). Various indicators have been used in empirical studies of perceived desirability, feasibility and intention. The indicators used in this study are inspired from studies by Krueger (1993), Krueger et al. (2000), Kickul and Krueger (2004), and Liñán et al. (2011).

Perceived desirability refers to the degree to which one feels attraction for a given behaviour, and it is assessed by four items: "I want to be my own boss"; "I like the idea of having my own company"; "I can't imagine working for somebody else"; "Running my own company would be personally satisfying". When the alpha is higher than 0.7 it is usually considered acceptable, and the scale structure is satisfactory (alpha=0.76). *The mean score on perceived desirability for self-employment for students with high CP activity was significantly higher than the mean score for those with no CP or low CP activity.*

Perceived feasibility is defined as the degree to which people consider themselves personally able to carry out certain behaviour. Three items are used to measure feasibility: "I know what it takes to start my own company"; "If I started my own company I am sure it would be successful"; "I have enough self-confidence to start my own company". The scale structure is satisfactory (alpha=0.77). *The mean score on perceived feasibility for self-employment for students with high CP activity was significantly higher than the mean score for those with no CP or low CP activity.*

Entrepreneurial intention is a significant predictor of someone becoming an entrepreneur. Four items are included in our measure of entrepreneurial intention: "I am determined to create a company in the future"; "I have very seriously thought about starting a company"; "I intend to start a company someday"; and "I will make every effort to start and run my

own company" (alpha=0.86). *Differences between the three groups (high, low, no) were insignificant with regard to entrepreneurial intention.*

Table 3.5: Post-test results for students on knowledge and preference for self-employment, percentages adjusted for baseline (pre-test results)

	NO CP	Low CP	High CP
Possess the skills and the knowledge necessary to start a new company	35	39	44
Prefer self-employment rather than being an employee	57	57	62
Initiated or started an activity or project	39	39	42

In addition, to measurements based on multiple items (desirability, feasibility, intention), we also measured three single item questions on self-employment. The indicator of business skills was the question: 'Do you have the necessary knowledge and skills to start a new business?' After baseline adjustment a higher proportion of those with high CP activity reported that they had the necessary knowledge and skills. The indicator of career preferences was the following question: 'If you could choose between being self-employed and being an employee, what would you prefer?' After baseline adjustment a somewhat higher proportion of those with high CP activity reported that they had the necessary knowledge and skills. A third question was: `Have you initiated or started on your own, or in collaboration with others, an activity or a project outside school, which lasted over some time (e.g. sport club, music, theatre group, youth NGO, political organisation, children activity clubs, environment activities etc.)? After baseline adjustment differences between the groups were small.

We also did logistic regressions controlling for other relevant factors. Compared to those with no CP, a significantly higher proportion of those with high CP activity reported that they had business skills (OR = 1.7). High CP-participants are 1.7 times more likely to perceive that they have knowledge and skills related to how to start a business compared to non-participants. Compared to those with no CP, a significantly higher proportion of those with high CP activity reported that they preferred self-employment (OR = 1.4). Moreover, it seems that the perceived effect of CP on skills and knowledge and preference for self-employment is somewhat stronger among young women than men. This is consistent with the previous study (Johansen 2016; 2017).

The analyses controlled for age, gender, education programme, migratory status, parents' education, parents' entrepreneurial experiences, and results on desirability, feasibility and intention in the pre-test. Boys and students with parents with entrepreneurial experiences had higher entrepreneurial ambitions, as compared to girls and students whose parents did not have entrepreneurial experiences.

It is also interesting to see what the other groups think regarding the CP and its possible impact on boys` and girls` entrepreneurship ambitions. The threshold asked in the question is "increase the proportion…". Please note that parents were not asked about the division between boys and girls.

Table 3.6: Percentages reporting that the CP increases the proportion of boys and girls with ambitions as regards entrepreneurship. Teachers (n=181), business people (n=125) and parents (n=988).

	Teachers	Business people	Parents
Boys			
Possess the skills and the knowledge necessary to start a new company	65	75	71
Prefer self-employment to being an employee	41	58	56
Intend to start a voluntary organization /social enterprise	27	36	38
Girls			
Possess the skills and the knowledge necessary to start a new company	68	69	
Prefer self-employment to being an employee	42	59	
Intend to start a voluntary organization /social enterprise	31	45	

About 70% of teachers, business people and parents believe the CP increases the proportion of students that possess the skills and the knowledge necessary to start a new company. Close to 60% of business people and parents believe the CP increases the proportion of students that prefer self-employment rather than being an employee, and 40% of teachers agree to this. About 30% of teachers and 40% of business people and parents believe the CP increases the proportion of students that intend to start a voluntary organization /social enterprise.

3.2.2   Reply to research questions on entrepreneurial ambitions

Will students who participated in a mini company have more knowledge and competences regarding establishing their own company? Yes, the results are positive. High CP activity seems to have a positive influence on perceived feasibility for self-employment, and high CP activity also seems to have appositive influence on skills and knowledge necessary to start a new company. The findings are consistent with prior research, and they are consistent with the positive assessment from teachers, business people and parents in the surveys. Also in the qualitative interviews both the teachers and

the students pointed out that the students gained considerable knowledge about starting and running a company, not only in theory, but in practice. This implies concrete knowledge about the different phases of a business, from having an idea to producing, marketing and selling it.

Will students who participated in a mini company have higher entrepreneurial ambitions? It seems that they do to some degree. A higher proportion of those with high CP activity reported that they preferred self-employment, but the influence on entrepreneurial intentions and desirability for self-employment was weak. These findings are consistent with prior research using indicators on entrepreneurial ambitions. More than half of business people and parents agree that the CP can increase the proportion of students that prefer self-employment, while less than half of teachers agree with this.

Will participating in a mini company at school in the age group between 15 and 20 increase the potential of being an entrepreneur later in life? Participation in mini-companies is a long-term means to promote entrepreneurship. The participants in the study are 16-19 years of age, so it is not to be expected that they create a business immediately after the mini-company is completed. However, participation in mini-companies could increase the chance of individuals attempting to start a business at a later point in their lives, since the experience seems to infuse knowledge and skills related to how to start and run a business, and to some degree raise interest in self-employment. A few former long-term studies have investigated start-up frequency among former participants in mini-companies. These studies indicate that former CP-participants are more likely than non-participants to start a new company (Wennberg 2010; Johansen 2013).

3.2.3   Motivation and performance

This part of the study investigates whether participation in mini-companies can increase school motivation, attendance and performance. Although some policy documents present the assumption that EE can have a positive effect on motivation and attendance, research in the field is divided. The few studies that have been done previously, show little or no correlation between mini-company participation and motivation, effort and attendance (Johansen 2014; 2014b; Somby & Johansen 2017).

However, three Norwegian studies have investigated mini-companies and school performance. The first study indicated that entrepreneurship projects had neither a positive nor negative impact on school performance among students 17-19 years of age (Johansen 2014). A second study confirmed that mini-companies had no influence on school performance among students 17-18 years of age, but it also indicated that mini-companies had a positive impact among students 15-16 years of age (Johansen & Schanke 2014). The final study compared students with special needs who participated in mini-companies and students with special needs who did not participate in mini-companies, found that

participating in mini-companies had a positive influence on the students' grades in Norwegian and Mathematics, but not in English (Johansen & Somby, 2016).

Table 3.7 Comparing High-CP (100+ hours), Low-CP (-99 hours) and Non-CP (0 hours) and motivation, effort and performance using Cohen`s d and ANCOVA. The analyses control for age, gender, education programme, migratory status, parents` education, parents` entrepreneurial experiences, and pre-result (*<0.01-level). Scales from 1 (low) to 5 (high) on motivation and effort, and 1 to 6 on performance.

	Cohen`s d	ANCOVA		
	High-Non	No CP	Low CP	High CP
*School motivation	<0.1	3.3	3.1	3.3
*School effort	<0.1	3.4	3.3	3.5
*School performance	0.25	3.7	3.7	3.9

* = significant correlation at 0.01-level

High = 100+ hours CP, Low = -99 hours CP, Non = No CP activity

Motivation is an important driving force for learning and has an impact on behaviour in school. Within the psychological field, it is common to differentiate between intrinsic and extrinsic motivation (Deci & Ryan 2000), and our scale was connected to intrinsic motivation. Four items were included: 'I like to do schoolwork', 'I have great interest in what we learn in school', 'I enjoy going to school' and 'I like to work with most of the subjects'. The scale structure is satisfactory (alpha=0.83). *Those with high CP activity had significantly higher scores on intrinsic motivation compared to those with low CP activity. But those with low CP activity had also lower scores on intrinsic motivation compared to those with no CP activity.*

There are various approaches to measure school effort, and one point of view is that a high degree of school effort is about being committed to school tasks and working hard at various subjects. The effort-scale was related to the process of achieving certain goals and the students' priorities at school, and how hard they were willing to work. Four items were included: "I prioritise schoolwork", "I always do my homework", "I work as hard as I can at the subjects", and "I keep working at subjects even if they are difficult". The scale structure is satisfactory (alpha=0.73). *Those with high CP activity had significantly higher scores on school effort compared to those with low CP activity. But those with low CP activity had also lower scores on school effort compared to those with no CP activity.*

The indicator used for school performance is the students' Grade Point Average (GPA) for one school year. GPA is calculated by adding the grade points a student earned and dividing the sum by the total number of subjects taken. GPA was measured both before the CP started and afterwards. *The GPA of students with high CP activity was significantly higher than the GPA of non-participants.* A further cross-country analysis of this result shows that school performance as measured by the GPA improves in Finland, Italy and Latvia, but not in Belgium.

In addition, we also looked at school absence and sickness presence. Absence from work/school can be based on an excused leave (due to civic duties, children's sickness, medical appointments, etc), sickness absence (due to disease, injuries, or illness), or absenteeism (unexcused absence due to truancy, shirking, lateness, etc). Regarding *absence, there were no significant differences between those with high, low and no CP activity.* Sickness presence (SP) refers to going to work despite illness. Several studies in different countries and among different occupational groups have shown that large shares of employees have gone to work, when they ought to stay at home due to health reasons. One study has also investigated SP in secondary school (Johansen 2015). The indicator used here is: "During the last school year, did you go to school even when feeling so ill that you should have taken sick leave?" *Students with high CP activity reported significantly higher SP than those with low CP activity.* The most common motives for SP was school attendance requirements and that crucial material/syllabus was presented at school. Some students with high CP activity reported SP because they enjoyed participating in the CP, or that they did not want to burden the other students in their mini-company.

The analyses controlled for age, gender, education programme, migratory status, parents' education, parents' entrepreneurial experiences, and results on key competences in the pre-test. It is worth noting that females and students with high educated parents had higher scores on these dimensions, as compared to males and students whose parents were less educated.

Table 3.8: Percentages of teachers reporting that they agree that the CP improves students` motivation, effort and attendance. Teachers (n=181)

	%
School motivation	57
School effort	55
School performance	49
School attendance	53

As table 3.8 indicates, more than half of the mini-company teachers agree that mini-company participation improves school motivation and school effort for most students. These findings nuance the results for the students on school motivation and effort. Also, about half of the teachers agree that mini-company participation improves school performance and attendance. The impression reported by teachers on school performance fits well with the results for the effect study among students.

The impressions from parents on behalf of their son/daughter are positive regarding the mini-company participation. About 70% agree that their child enjoyed the tasks they did in the mini-company, the combination of theoretical and practical work, and working with

other students. About 60% agree that their child is passionate about the mini-company, work extra hours, and find the mini-company challenging.

More about students with low CP activity and motivation
Students with low CP activity had lower scores on motivation compared to students with no CP activity and those with high CP activity. One could ask whether low motivation causes low CP activity or low CP activity causes low motivation. We have done several analyses using split data techniques to better understand the findings for motivation.

First, we analysed scores on each of the items in the scale variable for intrinsic motivation. When we investigate adjusted post-results (controlled for pre-test results and other relevant variables), we find that those with low CP activity have lower scores than the other groups on all four items: 'I have great interest in what we learn in school', 'I like to do schoolwork', 'I enjoy going to school', and 'I like to work with most of the subjects'.

A second set of analyses was to investigate results for the low CP activity group country by country. Then we find that the mean score on intrinsic motivation for the low activity group is about the same in the pre-test and post-test in Finland (3.3) and Italy (3.1), but the score declines in Latvia and Estonia (3.2 to 3.1) and Belgium (2.8 to 2.7). For the other groups (no CP activity or high CP activity), the mean results are the same or increasing from pre-test to post-test. Another way to compare countries is to investigate adjusted post-results by country (controlled for pre-test results and other relevant variables). Then we find that the low CP activity group have lower scores in Belgium, Estonia and Latvia, but this is not the case in Finland and Italy. Thus, there are some country differences.

A third analysis was to compare results on intrinsic motivation for those with mandatory participation and those with voluntary participation among students in the low CP activity group. Investigating adjusted post-test results (controlled for pre-test results and other relevant variables), we find that students with low CP activity and with mandatory and voluntary participation have the same score (3.0)

A final set of quantitative analyses combined scores on post-test motivation with the evaluation of the mini-company programme. Whilst most of the students recommend mini-companies and have positive experiences, some students are less satisfied with the mini-company. We can analyse whether there is a correlation between scores on intrinsic motivation and scores on the mini-company evaluation for those in the low activity group. Students reporting lower scores on the mini-company assessment also report lower scores on post-test intrinsic motivation; and students reporting higher scores on the mini-company assessment also report higher scores on post-test intrinsic motivation. The most notable of these correlations can be found for: combining theoretical and practical work; the tasks they did in the mini-company; working with the other students; and working with the mini company. The students with low scores on post-test motivation also scored

lower on satisfaction with the support and assistance from the teacher(s) and satisfaction with the mini company as an educational method.

From the qualitative interviews we learnt that mini-companies have the potential to create environments in which all the students can participate and gain a sense of accomplishment, thus creating an inclusive learning experience. A mini-company experience can enable an increased sense of mastery, but it can also hinder it. There are three aspects that may promote or hinder students` expectation of mastery; the risk associated with starting a CP; whether or not the experience feels realistic and meaningful; and the requirements towards self-regulated learning. First, the initial starting period may be critical in terms of all students having an expectation of successfully mastering the work of the CP. The teachers must be aware of students who need additional support and the nature of their needs. Second, the effort put in by the students is affected by how meaningful they perceive working with mini-company to be. Most students find the CP very motivating, but some students will perceive the work as not very motivating. Third, both the students and the teachers point out that this work requires the students to regulate their learning process on their own, while the teachers function more as advisors. Self-regulated learning contains many elements that need to be learned, and this learning must be in proportion to the student's maturity and development levels. The teacher should be actively observing and adjusting to the situation, so that all the students have activities they can expect to master.

The interviews also highlighted that learning outcomes for students depend on the cooperation with the teacher. When teachers cooperated with and monitored their students closely, the learning process was better. Some teachers highlighted the pedagogical advantages of this way of learning. They pointed out that the most important success factor for CP is the opportunity it provides for the individual student. Teachers (and students) describe how mini-companies provide opportunities for personal growth through practical knowledge; opportunities that the school otherwise does not provide.

3.2.4   Reply to research questions on performance and motivation

Will participation in an entrepreneurship activity like the mini-company influence on learning in other subjects? Yes, the mini-company seems to have a positive influence on learning in other subjects. The GPA of students with high CP activity was significantly higher than the GPA of non-participants. Moreover, half of the mini-company teachers agreed that CP could improve school performance. Considering earlier research in the field, the ICEE-results are more positive. The previous large-scale studies from Norway indicated that mini-companies had neither a positive nor negative impact on school performance among students in upper secondary school (17-19 years of age), but that mini-companies had a positive impact in lower secondary school (Johansen 2014; Johansen & Schanke 2014; Johansen & Somby 2016).

Can we find a connection between students participating in the field trial and motivation for school? Yes, we find a connection according to time and effort put into the mini company and intrinsic school motivation: the students with high CP activity have a significantly higher score on intrinsic motivation and effort than the students in the low CP activity group. There is also a negative correlation for students with low CP activity and intrinsic motivation, as the student with low CP activity score significantly lower than those with no CP activity. Previous articles have shown no correlations between mini-company participation and motivation and effort (Johansen 2014; 2014b; Somby & Johansen 2017), and these results show the importance of time spent in CP. Moreover, more than half of the mini-company teachers agree that mini-company participation improves school motivation and school effort for most students, and most parents find that their child has had many positive experiences in the mini-company.

In trying to understand the results, several additional analyses on intrinsic motivation were conducted. There are two main findings from the additional analyses. First, there were some country differences regarding correlations between low CP activity and intrinsic motivation. Second, it seems that satisfaction with the participation in the mini-company correlates with post-test intrinsic motivation. Most students find the CP very motivating, but some students will perceive the mini company work as not very motivating and/or difficult to master, and then (the extra) work with mini-companies can contribute to lower motivation for school.

3.2.5   Key competences

The development of the entrepreneurial competencies of European citizens and organisations has been one of the key policy objectives of EU for many years. The EU framework defines key competences as a combination of knowledge, skills and attitudes which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment. For young people, key competences should be acquired by the end of their compulsory education and training, equipping them for adult life, particularly for working life, while forming a basis for further learning. The transversal nature of key competences makes them essential. Please note that key competences are measured by the students (self-perception) and with single items, and these two aspects represent limitations to this part of the study. Development of key competences is not the main aim of CP, and, therefore, it is expected that the influence will be limited.

Table 3.9 Comparing High-CP (100+ hours), Low-CP (-99 hours) and Non-CP (0 hours) and key competences, Cohen`s d and ANCOVA. The analyses control for age, gender, education programme, migratory status, parents` education, parents` entrepreneurial experiences, and pre-result (*<0.01-level). Scales from 1 (low) to 5 (high)

	Cohen`s d	ANCOVA		
	High-Non	No CP	Low CP	High CP
*Sense of initiative and entrepreneurship	0.15	3.4	3.4	3.6
*Civic competence	0.11	3.3	3.3	3.4
*Mathematical competence	<0.1	3.3	3.3	3.4
*Oral communication in the mother tongue	<0.1	3.8	3.7	3.9
*Digital competence	<0.1	3.5	3.5	3.6
Cultural awareness and expression	<0.1	3.6	3.5	3.6
Written communication in the mother tongue	<0.1	3.7	3.7	3.8
Learning to learn	<0.1	3.6	3.6	3.7
Social competence	<0.1	3.6	3.6	3.7
Competence in science and technology	<0.1	3.4	3.3	3.4
*Communication in foreign languages	<0.1	3.5	3.4	3.5

* = significant correlation at 0.01-level

High = 100+ hours CP, Low = -99 hours CP, Non = No CP activity

Table 3.10: Percentages of teachers reporting that they find CP effective in increasing students` key competences effort and attendance. Teachers (n=181)

	%
Sense of initiative and entrepreneurship	78
Social competence	72
Digital competence	68
Oral communication in the mother tongue	60
Cultural awareness and expression	59
Learning to learn	56
Civic competence	54
Written communication in the mother tongue	50
Communication in foreign languages	46
Competence in science and technology	39
Mathematical competence	39

Those with high CP activity had significantly higher scores than those with no CP or low CP activity on "sense of initiative and entrepreneurship". It can also be mentioned that there was a positive result for "civic competence" for the high CP activity group. With regard to the development of the other key competencies, the influence is limited.

We also asked teachers about their observations in this area. 78% of mini company teachers found CP effective in increasing students` sense of initiative and entrepreneurship, and about 70% found it effective in increasing students` social competences and digital competence. Approximately all of the teachers also found CP effective in increasing students` oral communication in the mother tongue and cultural awareness. Thus, most of the mini-company teachers are very positive to the effectiveness of the programme.

In the qualitative interviews the students, teachers and parents pointed out that students had learnt generic skills and that CP stimulated key competences. Teachers, parents and students all mentioned such skills as how to communicate and resolve conflicts within a group, how to present a product (native language and English), and how to handle company finances. For some students, their understanding of how useful other subjects were increased, and they started to pay more attention to those subjects. Moreover, the students mentioned new attitudes towards themselves and the other students, regarding responsibility, courage, patience, pro-activity and independence. The teachers mentioned personal gains such as improved confidence and competence as some of the most valuable CP learning outcomes. The parents also witnessed these changes.

3.2.6   Transversal competences

On the one hand, entrepreneurial competencies can be understood as a specific group of competencies relevant to the exercise of successful entrepreneurship. Bird (1995) suggested that entrepreneurial competencies are underlying characteristics such as specific knowledge, motives, traits, self -image, social roles and skills which result in venture birth, survival and/or growth. Man et al. (2002) saw entrepreneurial competencies as the total ability of the entrepreneur to perform a job role successfully. Entrepreneurial competencies have also been understood in terms of traits, skills and knowledge (Lau et al. 1999) and there has been an interest in how these skills are applied in different contexts (Hunger & Wheelen, 1996).

Entrepreneurial competencies can also be understood as transversal and applied to all spheres of life. Entrepreneurship can be defined as acting upon opportunities and ideas and transforming them into economic, cultural, or social value for others (Bacigalupo et al. 2017). This definition embraces various types of entrepreneurship and applies to both individuals and groups, and is domain neutral in the sense that one can act upon ideas and opportunities to generate value for others in any domain and with possible value chain. In this perspective, entrepreneurial competencies include personal development, actively participating in society, entering the job market as an employee or as a self-employed person, including starting up ventures (whether they are cultural, social or commercial). And within the EntreComp-framework, competencies such as project management, creativity, teamwork and self-efficacy are considered as valuable to entrepreneurship (and other spheres in life) (Bacigalupo et al. 2017).

Table 3.11 Comparing High-CP (100+ hours), Low-CP (-99 hours) and Non-CP (0 hours) and transversal competences, Cohen`s d and ANCOVA. The analyses control for age, gender, education programme, migratory status, parents` education, parents` entrepreneurial experiences, and pre-result (*<0.01-level). Scales from 1 (low) to 5 (high)

	Cohen`s d	ANCOVA		
	High-Non	No CP	Low CP	High CP
*Project management	0.24	3.5	3.5	3.7
*Team work	0.18	3.9	3.9	4.0
*Creativity	0.15	3.5	3.5	3.6
*Self-efficacy	0.14	3.6	3.6	3.7

The first scale is "project management". Project management is assessed by four items, starting with "I am able to": "create a project plan"; "set project goals", "structure tasks in a project"; and "delegate various tasks/activities". The scale structure is satisfactory (alpha=0.85). *Those with high CP activity had significantly higher scores compared to those with no CP or low CP activity on project management.*

The second scale is "team work". A team is two or more individuals who must interact to achieve one or more common goals, and the competency to work in a team is central to CP. Team work is assessed by five items: "I am able to work together with other people"; "I am able to actively participate in team work"; "I am good at promoting my own ideas and opinions when working in a group"; "I am good at giving positive feedback when working in a group"; and "I am able to listen to what the others are saying when working in a group". The scale structure is satisfactory (alpha=0.81). *Those with high CP activity had significantly higher scores compared to those with low CP activity on team work.*

The third scale is "creativity", and the scale used is inspired by Marsh & O'Neill (1984). Creativity is assessed by five items: "I am good at combining ideas in new ways"; "My thoughts, ideas and actions are often original/new"; "I am good at making routine tasks exciting"; and "I like trying new things and activities"; and "I am often able to come up with answers to difficult problems". The scale structure is satisfactory (alpha=0.76). *Those with high CP activity had significantly higher scores compared to those with low CP activity on creativity.*

The final scale is "self-efficacy". Various indicators have been used in empirical studies of perceived self-efficacy, and the scale used is inspired by Schwarzer & Jerusalem (1995). The original scale consisted of ten items and was designed for the general adult population (12+ years) to predict coping with daily hassles and adaptation after stressful life events. The authors have reasoned that the scale is suitable for a broad range of applications, and we found five of the items to be suitable: "I can deal efficiently with unexpected events"; "Thanks to my resourcefulness, I know how to handle unforeseen situations"; "I can solve most problems if I invest the necessary effort"; "I remain calm when facing difficulties

because I can rely on my coping abilities"; and "I can usually handle whatever comes my way". The scale structure is satisfactory (alpha=0.81). *Those with high CP activity had significantly higher scores compared to those with low CP activity on perceived self-efficacy.*

The analyses controlled for age, gender, education programme, migratory status, parents' education, parents' entrepreneurial experiences, and results on management, self-efficacy, creativity and team work in the pre-test. It is worth noting that students with highly educated parents had higher scores on these dimensions, as compared to students whose parents had less education.

Table 3.12 Comparing High-CP (100+ hours), Low-CP (-99 hours) and Non-CP (0 hours) and assessment of single item transversal competences, Cohen`s d and ANCOVA. The analyses control for age, gender, education programme, migratory status, parents` education, parents` entrepreneurial experiences, and pre-result (*<0.01-level). Scales from 1 (very poor) to 5 (very good)

	Cohen`s d	ANCOVA		
	High-Non	No CP	Low CP	High CP
Commitment competencies	0.20	3.7	3.6	3.9
Presentation skills	0.16	3.4	3.4	3.6
Deal-making/negotiation skills	0.13	3.5	3.5	3.6
Managing timelines and projects	0.13	3.4	3.3	3.5
Ability to coordinate activities	0.12	3.6	3.5	3.7
Decision making skills	<0.1	3.6	3.5	3.6
Taking initiative	<0.1	3.5	3.5	3.6
Leadership skills	<0.1	3.5	3.4	3.6
Ability to motivate others	<0.1	3.7	3.6	3.7
Managing risk	<0.1	3.4	3.3	3.4
Punctuality	<0.1	3.8	3.7	3.8
Network	<0.1	3.5	3.4	3.5
Perseverance	<0.1	3.7	3.6	3.7

Those with high CP activity had significantly higher scores than those with no CP or low CP activity on commitment competencies and presentation skills. There was also a positive correlation for high CP-activity and deal-making/negotiation skills, managing timelines and projects, and ability to coordinate activities. With regard to the other competencies, the influence seems to be limited.

We also asked teachers about their observations in this area. 80% or more of the mini company teachers agreed that CP improved presentation skills, sense of initiative, decision making skills, ability to coordinate activities, commitment competencies, managing timelines and projects, deal-making/negotiation skills, and leadership skills. Thus, most of the mini-company teachers think highly of the student impact of the programme.

Table 3.13: Percentages of teachers that agree that CP improves the following skills and competencies among students. Teachers (n=181)

	%
Presentation skills	88
Sense of initiative	85
Decision making skills	84
Ability to coordinate activities	84
Commitment competencies	83
Managing timelines and projects	81
Deal-making/negotiation skills	80
Leadership skills	80
Perseverance	75
Ability to motivate others	75
Network	73
Punctuality	68
Risk management	66

In the *qualitative interviews* the students talked about the group process, responsibility and management. The students participating in the CP found that they were taking part in a group process in which they learnt to work in a democratic way with all group members exerting influence. Consequently, they learnt valuable communication skills, conflict solving and decision making, and that they had to work hard for their company to succeed. Moreover, the students were content with working independently and taking responsibility, and they claimed they learnt more that way. The teachers, volunteers and parents had the same opinion. The students described the CP as more 'real' than any other projects they had been a part of, due to the programme's length and time requirements, which enhanced the authenticity of the experience and provided opportunities for trial and error. They learnt to take responsibility both for the student company and for their own learning process.

3.2.7   Reply to research questions on self-confidence and depth of experience

Will students who participated in a mini company have better academic self-confidence?
High CP-activity has a positive influence on various transversal competences and key competences. Those with high CP activity had significantly higher scores than those with no CP or low CP activity on: sense of initiative and entrepreneurship, project management, teamwork, creativity, self-efficacy, commitment competencies and presentation skills. Many mini-company teachers also observed that students developed key competences and transversal competences through their participation. Especially, the teachers pinpointed that CP improved presentation skills, sense of initiative, decision making skills, ability to

coordinate activities, commitment competencies, managing timelines and projects, deal-making/negotiation skills, and leadership skills.

Regarding the mini company experience, can we find connections between the depth (number of hours) of the experience and the learning outcomes? The results show that quantity is essential, if practical entrepreneurship projects like mini-companies are to make an impact for the individual and society. 70% of the CP-students spent more than 100 hours working on the CP (high CP activity) and 30% of the students spent 99 hours or less (low CP activity). Students using more than 100 hours in the CP seem to be positively influenced by this participation, while students using fewer than 100 hours do not seem to be influenced by the participation. The main aim of CP is to enable students to establish their own real enterprise and discover first-hand how a company functions, but students with high CP activity also seem to be positively influenced in other areas. Among other things, the analyses show that those with high CP activity had significantly higher scores compared to students with no CP or low CP activity on: perceived feasibility for self-employment; project management; team-work; sense of initiative and entrepreneurship; and school performance.

3.3   Community effects (CP and schools, teachers and business people)

The ICEE study also investigated the potential organizational impact at schools and possible changes in attitudes for both teachers and business people. With regard to attitudes, little research has been carried out on the impact of participation in EE and a possible change in attitudes towards the use of EE in school.

Subchapter 3.3 will focus on these research questions:
- Can we identify any change in the relationship between the school and the local community among those participating in the field trial?
- The role of the JA organisations' as seen from the school perspective?
- What were the main drivers / obstacles in reaching 50% penetration as seen from the ministry, the headmasters, the teachers and representatives from JA?
- The knowledge and importance of national strategic plans in the school environment and the community connected to the schools?

3.3.1   Entrepreneurship education at the school

With regard to organizational impact, we have compared the situation on a number of dimensions at test schools and control schools in the post-test.

Table 3.14: Please indicate the extent to which you agree (5) or disagree (1) with statements about your school and its focus on entrepreneurship education in the previous school year. Mean post-test results for teachers (n=803), divided by type of school (control schools and test schools).

	Control schools	Test schools
There is a leader/leading team that sustains the promotion of EE	2.9	3.9
EE is an integral part of my school`s ethos and culture	2.8	3.8
My school has a plan for EE	2.9	3.8
The school collaborates with local businesses and/or organisations in the delivery of EE	2.9	3.6
Content and methods related to EE are prioritised at my school	2.6	3.5
The importance given to promote EE is widely communicated with students	2.6	3.5
The importance given to promote EE is widely communicated with the staff	2.6	3.4
Teachers are encouraged to engage in EE	2.7	3.4
The importance given to promote EE is widely communicated with partners and the local community	2.4	3.1
Sufficient financial resources are available for EE	2.6	3.1
The importance given to promote EE is widely communicated with parents	2.4	3.1
Teachers are familiar with different concepts and working methods related to EE	2.4	2.9
EE activities include most of the teachers	2.3	2.9
Project work is widely practiced at my school	3.5	3.8
Learning by doing and self-organised learning is widely practiced at my school	3.5	3.7
Learning outside the classroom (e.g. study tours and field visits to local businesses or organisations) is widely practiced at my school	3.5	3.7
Bringing the real world into the classroom (e.g. lecturers from business or organisations) is widely practiced at my school	3.3	3.6
Professional development and training are available for teachers to be involved in EE	2.9	3.2
Sufficient human resources are available for EE	2.8	3.1

After ICEE, most teachers at the test schools agreed that their school "has a plan for EE", that "EE is an integral part of the school`s ethos and culture", and that "there is a leader/leading team that sustains the promotion of EE". Moreover, most teachers at the test schools agreed that "the school collaborates with local businesses and/or organisations in the delivery of EE", that "content and methods related to EE are prioritised", that "the importance given to promote EE is widely communicated with the staff and with the students" and that "teachers are encouraged to engage in EE". For all these dimensions, the teachers at the control schools scored much lower.

After ICEE, half of the teachers at the test schools agreed that "the importance given to promote EE is widely communicated with partners and the local community", that "sufficient financial resources are available for EE", and that "the importance given to promote EE is widely communicated with parents". Almost half of the teachers at the test schools agreed that "teachers are familiar with different concepts and working methods related to EE" and that "EE activities include most of the teachers". For all these dimensions, the teachers at the control school scored much lower.

Most teachers at both the control schools and the test schools agreed that "project work is widely practiced", that "learning by doing and self-organised learning is widely practiced", that "learning outside the classroom is widely practiced" and that "bringing the real world into the classroom is widely practiced". Few teachers at both the control schools and the test schools agreed that "sufficient human resources are available for EE" and that "professional development and training are available for teachers to be involved in EE". For all these dimensions, differences between test schools and control schools are less obvious.

As seen from the quantitative studies, the ICEE project strengthened and developed the focus on EE at the test-schools. In the final meeting of ICEE in Tallinn in November 2017, 55 teachers and head-teachers from 15 countries met to share their knowledge and practices, and they agreed on the following recommendations on how schools can best integrate EE.

Do not go alone as a teacher. Teachers implementing entrepreneurship education programmes and or using entrepreneurial methods in their practices should not be left alone. They should always have someone to discuss with, to exchange opinions with and be able to seek advice. The school should establish a network not only within the school, but also outside the school with other teachers or schools at regional, national and international level.

Every teacher should be somehow involved or informed about EE. Inform all teachers about the initiative was the message. Teachers from different subjects should be informed and learn about the challenges and benefits of entrepreneurship education and gain an understanding of the opportunities in their subject. It is important as well to give recognition to the teachers already at work on EE.

Experienced teachers can lead the teacher training. The lack of skills of teachers is still hindering the uptake of entrepreneurship education. The training should use "learning by doing methodology" and, when in training, teachers should try out the programme and/or activities themselves. This will help them understand what it means for the students to be involved in entrepreneurship education, and it will challenge teachers' own comfort zone. The focus should be on the methodology. Analysing the mistakes done when teaching entrepreneurship education is the key to understanding how to improve it. Both in the

classroom and in training it is important for the motivation to allow to test, fail and learn. If the school has experienced teachers, these teachers should train newcomers and other teachers in the school who want to move into entrepreneurship education. In that way, experienced teachers can be volunteers for less experienced teachers. Entrepreneurship education means having fun while learning, and that's why it is important to make students understand the seriousness of activities such as the mini-company project.

Engage the local community and start with the parents. Communicate with parents as they need to be informed. Bring them, for instance, on board as volunteers for the students. Do the same with the local community, either if it is the school reaching out to (trade fairs, events, etc.) or using the local community as a resource of knowledge and support.

Improve the school environment and generate awareness. When moving into entrepreneurship education, the school should have some flexibility in the time-schedule and dedicate a couple of hours for the teachers to work together. As the school expands its activities, entrepreneurship education should be more integrated into the activities, and the school should have a progressive plan. Sometimes changing the structure of the school rooms as well as having more flexible areas (open spaces) where the students can work would help. Providing good role models and alumni examples can motivate students as well as teachers. It is also important to communicate the impact of entrepreneurship education to all stakeholders.

Leadership involvement. The support from the head teacher, who represents the leadership at the school, is a critical success factor. He/she must be involved, informed and updated about progress, activities and achievements.

3.3.2   Teachers` attitudes to entrepreneurship education

This part of the study compares the attitudes of CP teachers (about 22% of the sample) and teachers not participating in CP (78% of the sample). Looking at the means, we find that the three statements with the highest scores are "EE should focus on methods based on real experience (e.g. mini-companies, project work with real enterprises)"; "EE should have high priority in vocational education"; and "EE is very relevant in secondary school"

Analysing teachers' attitudes towards EE, we discovered interesting findings in the quantitative studies. Teachers with CP-experience had higher scores on some dimensions as compared to non-CP-teachers. CP-teachers more often found that "EE is very relevant to primary school", that "EE should focus on methods based on real experience", that "EE should be a mandatory part of teacher education, that "teachers who have completed their education should be offered advanced training in EE", and that "EE should be embedded as a subject in compulsory education".

However, on most dimensions presented in table 3.15, we do not find any significant differences in opinions between CP-teachers and the control group. This includes: "entrepreneurship should be embedded as an explicit goal in curricula in compulsory education"; "EE should have high priority in general/academic education"; "EE should be embedded as interdisciplinary projects in compulsory education"; "EE should be integrated into existing subjects in compulsory education"; "EE is very relevant in secondary school"; "Non-profit organisations and NGOs whose mission is promoting and delivering EE should receive state support"; and "EE should have high priority in vocational education".

Table 3.15 Comparing teachers participating in the CP with teachers not participating in the CP, using Cohen`s d and linear regression analysis. Control for pre-result, *<0.01-level, scales 1 (low) to 5 (high), mean for the whole sample, n = 803

	Cohen`s d	Difference CP-Non	Mean all teachers
EE is very relevant to primary school	0.25	0.3*	2.8
EE should focus on methods based on real experience (e.g. mini-companies, project work with real enterprises)	0.23	0.2*	4.1
EE should be a mandatory part of teacher education	0.21	0.2*	3.3
Teachers who have completed their education should be offered advanced training in EE	0.21	0.2*	3.6
EE should be embedded as a subject in compulsory education	0.20	0.2*	3.2
All students should have at least one practical entrepreneurial experience before leaving compulsory education	0.15	0.2*	3.6
Entrepreneurship should be embedded as an explicit goal in curricula in compulsory education	0.13	0.1	3.5
EE should have high priority in general/academic education	0.13	0.1	3.5
EE should be embedded as interdisciplinary projects in compulsory education	0.12	0.1	3.6
EE should be integrated into existing subjects in compulsory education	0.04	0.0	3.6
EE should have high priority in vocational education	0.04	-0.0	4.0
EE is very relevant in secondary school	0.08	-0.1	3.9
Non-profit organisations and NGOs whose mission is promoting and delivering EE should receive state support	0.05	-0.1	3.3

* = significant correlation at 0.01-level

CP = Teacher participating in CP, Non = Teacher not participating in CP

When asked about the usefulness of EE as regards subjects, teachers consider EE useful in Economics, Information and communication technology, and Social sciences and Technology. It is considered less relevant in Physical education and Religion/Ethics. Some teachers consider EE useful in Mathematics, Natural sciences, Languages, Arts education and Technology, and some do not. With regard to the subjects, there were no differences between the test and the control group of teachers, and CP-teachers did not change their attitudes on how useful they see CP in these subjects from the pre-test to the post-test. Thus, we do not need to set up a table.

3.3.3   Teacher satisfaction with JA

Mini-company teachers were asked about their experiences with JA in the mini company process. Table 3.16 shows that more than 70% of the CP-teachers were satisfied with the teacher training before the programme implementation and the mini company programme as an educational method. 60% or more of the CP-teachers were satisfied with JA's website, trade fairs, competitions, and JA's role as an intermediary between schools and businesses. Almost 50% were satisfied with the guidance from JA throughout the programme implementation. The samples of CP-teachers in each country are small, so there is no use in separating and comparing the countries.

Table 3.16: Percentages of teachers reporting that they are satisfied with JA and the CP (n=181).

	%
Teacher training before the programme implementation?	76
The mini company programme as an educational method?	73
JA's website?	67
Trade fairs?	66
Competitions?	60
JA's role as an intermediary between schools and businesses?	60
Guidance from JA throughout the programme implementation?	47

3.3.4   Business peoples` attitudes to entrepreneurship education

The study also allows an investigation of changes in attitudes among business people, as it compares volunteers to mini-companies (43% of the sample) with business people not participating as volunteers in CP (57% of the sample). Table 3.16 demonstrates that there are no statistical significant relationships, and there is no trend either in a positive or negative direction from the pre-test to the post-test. It should be noted that on all dimensions the volunteers have a positive view on EE both before and after participation. The statement they are less positive to is: "Companies should provide sufficient financial resources for EE."

Table 3.17 Comparing business people participating in the CP as volunteers in the pre-test and post-test. Paired samples t-test, mean values, scales 1 (low) to 5 (high), n = 97

	Pre-test mean	Post-test mean
EE is very relevant in secondary school	4.4	4.5
EE should focus on methods based on real experience (e.g. mini-companies, project work with real enterprises)	4.4	4.4
EE should have high priority in vocational education	4.3	4.3
Teachers who have completed their education should be offered advanced training in EE	4.3	4.2
Companies should participate more in EE	4.1	4.2
EE should have high priority in general/academic education	4.1	4.1
All students should have at least one practical entrepreneurial experience before leaving compulsory education	4.1	4.1
Companies should encourage employers to engage in EE	4.0	4.0
EE should be a mandatory part of teacher education	4.0	4.0
Non-profit organisations and NGOs whose mission is promoting and delivering EE should receive state support	4.0	4.0
Entrepreneurship should be embedded as an explicit goal in curricula in compulsory education	4.0	4.0
EE is very relevant to primary school	3.6	3.7
Companies should provide sufficient financial resources for EE	3.4	3.3

3.3.5   Students and career plans

We also asked students about their future plans. The results are presented in table 3.18 and they investigate different career plans. The division between no, low and high CP-activity does not matter much, but the results are interesting. More students have career goals/areas after another year in school (67% versus 61%), more students know whether or not they want to go to university (78% versus 72%), more students know which field they want to take a degree at University (95% versus 88%), and about half of the students want to develop their career abroad (both in the pre-test and post-test).

Table 3.18: Post-test results for students on their future plans, %. Pre-test result in parenthesis.

	NO CP	Low CP	High CP
Career goal			
Yes, I have one strong career goal	24 (20)	24 (18)	24 (18)
Yes, I can name possible career areas that might interest me	42 (40)	45 (43)	46 (44)
Not yet, but I am starting to think about careers	22 (28)	23 (26)	22 (28)
No, I do not know yet what type of career I want	12 (12)	8 (13)	8 (10)
Plan to take a degree at University			
Yes	57 (55)	64 (60)	63 (58)

No	20 (17)	14 (11)	17 (17)
Do not know	23 (28)	22 (29)	20 (25)
Field they plan to take a degree at University			
Economics and/or Business	20 (16)	26 (25)	33 (29)
Engineering	15 (12)	13 (10)	13 (11)
Professions (e.g. agriculture, medicine, social work)	14 (15)	10 (11)	10 (10)
Humanities/social sciences/natural sciences/teacher	27 (26)	17 (19)	23 (16)
Other fields	19 (20)	19 (22)	16 (23)
Do not know	5 (11)	5 (13)	5 (11)
Develop career abroad			
Continue living in the region	30 (32)	29 (33)	30 (31)
Move to another city in the country	24 (20)	22 (20)	22 (18)
Move to European country	21 (20)	21 (17)	23 (21)
Move to another country	25 (28)	28 (30)	25 (30)

3.3.6   Replies to research questions on community effects

The role of the JA organisations' as seen from the school perspective? Most mini-company teachers were satisfied with the mini company programme as an educational method and teacher training before the CP. Almost half of the teachers were satisfied with the guidance from JA throughout the programme implementation. Most of the CP-teachers were satisfied with JA's website, trade fairs, competitions, and JA's role as an intermediary between schools and businesses.

The knowledge and importance of national strategic plans in the school environment and the community connected to the schools? The working group on National Strategies analysed systemic issues that drive or hinder the success of a national strategic plan, and they came up with suggestions on how to develop, implement and review strategies. Having a particular strategy on EE was considered a main driver for spreading EE at the national level. In addition, several of the informants in qualitative interviews commented that having a national EE strategy was a main driver for the integration of EE and CP at their school. If there is a strategy for EE, and it becomes part of the school curriculum, it is much easier for teachers to implement it in their respective schools. With regard to knowledge about national strategic plans on EE most headmasters are well informed, but there seems to be much variation in the knowledge between CP-teachers and non-CP-teachers. Parents and business people may have some general knowledge, but they do not have in-depth knowledge about national strategic plans on EE.

What were the main drivers/obstacles in reaching 50% penetration as seen from the ministry, the headmasters, the teachers and representatives from JA? All the test schools managed to reach the goal of 50% penetration at a level in school. On a general note, the most important driver for EE is perhaps that all relevant actors (school managers, teachers,

students, parents and volunteers) have a positive view on EE. It is also a good thing that the retention rate for business volunteers is very high, and that the retention rate for teachers is high. Regarding the spreading of EE, teachers find it important that the school management prioritize EE. Moreover, they point to the importance of time, good-quality teacher training in EE and embedding EE in school policies/curricula. Engagement from intermediary organisations such as JA is important to spread EE. Regarding the spreading of EE, the representatives from JA pinpoint the importance of promoting cooperation between schools and businesses, training more teachers, integrating EE into different subjects, and more cooperation between teachers at the schools. Headmasters play an important role in promoting and implementing EE and the CP in their schools. Regarding the spreading of EE, the headmasters are aware of their own role as a door opener, and they also point to improved cooperation between business and schools, the importance of networking and to get funding from the government and the business sector, and that teachers that try the mini-company develop and/or change their attitude towards EE. The ministry representatives also commented on various important aspects to spread EE that can be possible drivers/hindrances, such as collaboration among different stakeholders to EE at the national level, integration of EE into the curriculum and a specific strategy for EE, autonomy of education (in some countries), and the local collaboration between schools and businesses.

Can we identify any change in the relationship between the school and the local community among those participating in the field trial? We can identify changes at the school level and among teachers and among students. The schools had to commit to an increasing the number of students participating in the CP to 50% of a year of students in the school, and this has strengthened and developed the focus on EE at the test-schools. The schools became much more "entrepreneurial". It is noteworthy that answers from CP-teachers and non-CP-teachers at the test-schools are consistent on this matter. Moreover, the CP-participation did not change business peoples` attitudes, but it did change teachers` attitudes to EE and CP to some degree. Compared to non-CP-teachers, the CP-teachers more often agreed that EE should be a mandatory part of teacher education, that teachers who have completed their education should be offered advanced training in EE. They also find EE relevant to primary school and want to embed EE as a subject in compulsory education, and they think EE should focus on methods based on real experience (e.g. mini-companies). In other areas, there are not significant differences between CP-teachers and the control group, such as: relevance and priority in secondary school; use of EE as an explicit goal in curricula; and integration into existing subjects and interdisciplinary projects. Both teachers in the field trial and teachers in control groups have the same opinion on the usefulness of EE in ten different subjects before and after the field trial.

4 OTHER PUBLICATIONS IN ICEE

4.1   Innovation Clusters

In addition to the research in ICEE, all ICEE partners worked on four priority areas. Through these "clusters" more than 40 good practices on National Strategies, Content and Tools, Teacher Training, Assessment were identified. Each good practice was described by using a canvas template where the activity/project highlights needs and outcomes as well as challenges and solutions for the target group addressed by the good practice. The template also provides additional information about the implementation method, the activities and the resources needed. The ICEE Clusters are presented on the ICEE-webpage: http://icee-eu.eu/innovation-clusters.html.

In addition to the good practices, each working group also identified practical recommendations on how to move entrepreneurship education forward. Those recommendations were divided according to the following four priority areas:

- *A Comparative Analysis of National Strategies* provides the basis for giving policy recommendations about success factors and key topics that should always be covered in a national strategy on entrepreneurship education.
- *Recommendations on Content and Tools* goes hand in hand with a How-to Manual for Teachers, a document which educators can use to better understand how to implement entrepreneurship education programmes in the classroom and become more entrepreneurial themselves.
- *Recommendations on Teacher Training* comes with a Questionnaire designed to help understand teachers' attitudes towards entrepreneurship/entrepreneurial education and collect information about what they need to implement regarding entrepreneurial practices in their schools.
- *Recommendations on Assessment* are provided together with an Assessment and Evaluation Toolbox that support educators in finding good assessment tools.

4.2   Research reports

Two research memos based on the qualitative studies were published during the project. The first was written by Eide and Olsvik (2017): *A Qualitative Case Study of Mini-company*

Experiences in Five European Countries. This research memo presented the results from the qualitative study in the ICEE project carried out in 2016. The study consisted of a three-day field study in five different schools in five countries: Belgium, Estonia, Finland, Italy and Latvia. The field studies were conducted during the period from March to June 2016. A total number of 75 informants were interviewed (students, teachers, parents, volunteers, JA representatives and representatives for the ministries).

The second research memo was written by Johansen, Aae, Elder, Valle and Langdal (2018): *A Multinational Study of Mini-company Experiences*. This research memo presented empirical findings from the qualitative study in the ICEE project carried out in 2017. The study consisted of a 15-day field study in five schools in five countries; Belgium, Estonia, Finland, Italy and Latvia. The field study was done from January to November 2017, and it focused on students and teachers and their experiences with the JA Company Programme (CP). These areas were of particular t interest: teachers' reflections on their role as mini-company teachers, whether mini-company participation can increase students' self-efficacy, and whether mini-companies are a suitable working method for students with special needs.

Two research memos based on the quantitative studies have been presented during the project, but they have not been published as research reports since the findings were preliminary. The first memo focused on the school year 2015/16. The second memo was a summary of results from the whole sample presented at the closing conference on the ICEE project in Tallinn in November 2017.

4.3   Key messages

Fifteen short popular scientific articles were presented from the spring 2017 to the autumn 2017. The key messages highlighted positive findings from the ICEE research which   can be found here: http://icee-eu.eu/the-research/first-results.html

The articles had these titles:
1. New cross-country study confirms the positive impact of JA Company Programme on students and society.
2. Teaching entrepreneurship is a modern and different way of teaching. We need training, teachers say.
3. Cooperation between education system and labour market is too weak, shows new international research.
4. Students participating in practical entrepreneurship education have higher school motivation.
5. Survey among 7000 students confirms: If you want to increase job creation, offer the JA company programme in schools.
6. A deep dive is better than a light touch. 100 hours of training in entrepreneurship education gives the best results!
7. Girls benefit from entrepreneurship education at a young age even more than boys.

8. Entrepreneurship education is new for parents. They need to be informed and involved.
9. Teaching entrepreneurship education is about guiding students and not giving answers. It works, teachers say.
10. New study confirms the positive effects of entrepreneurship education on students.
11. More support from Ministries of Education would push entrepreneurship education faster forward in Europe.
12. Mini-companies work! Students who have participated in a mini company know how to establish their own business.
13. Participation in a mini-company improves self-efficacy and school performance of students in special education.
14. A vast majority of parents support entrepreneurship education, shows new international research.
15. The business sector wants to be involved in education and schools want to collaborate with businesses: Let's make it happen!

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Innovation Cluster for Entrepreneurship Education

The research project "Innovation Cluster for Entrepreneurship Education" ran for three years, from January 2015 to January 2018. At the centre of the project was the mini-company method. Mini-companies combine practical and theoretical learning and stimulate collaboration between school and working life. The largest mini-company scheme is provided by Junior Achievement and their Company Programme (CP). Using pre-test/post-test survey data with test and control groups, combined with data from qualitative interviews, the ICEE project has given many indications on the impact of mini-companies on students and teachers, and how students, teachers and volunteers experience working with mini-companies. In addition, the project has contributed in identifying drivers and hindrances in spreading entrepreneurship education across Europe.