



An Introduction to

Entrepreneurship from ABC to PhD

Mapping of Entrepreneurship Education in Denmark



The Danish Foundation for Entrepreneurship – Young Enterprise is the central national knowledge centre and focal point for the development of entrepreneurship education at all educational levels. This takes place through activities which ensure that more pupils and students are introduced to an entrepreneurial mindset and that more training opportunities are created in cooperation with the country's educational institutions.

The vision is to strengthen Denmark's competitiveness by influencing the interest and competence in entrepreneurship, independence and innovation through efforts in the education sector.

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Entrepreneurship from ABC to PhD

For the fourth year in a row the Danish Foundation for Entrepreneurship – Young Enterprise has mapped the spread of entrepreneurship education at all levels of the education system in terms of the number of courses offered and the number of pupils and students who participate in this education. The purpose is to examine whether a development is taking place in view of the Danish government's strategy for entrepreneurship education. This strategy or vision is that a substantial amount of pupils and students at all levels of education develop their entrepreneurial abilities, that is not only their ability to think creatively, but also to utilize and manifest innovative ideas.

The report may be downloaded in a Danish version and in a short English version at www.ffe-ye.dk and is published in a printed full version in Danish, which can be ordered from the website.

This commitment is based on the belief that through entrepreneurship education children and young people achieve competences which give them better opportunities later in life to create growth for the benefit of the individual and of society; competences such as the ability to create opportunities, competence to act, creativity etc. provide the young people with a basis for future employment as innovative employees and for creating their own job – in the long run perhaps even for creating jobs for others in their respective companies and thus generating growth in society.

The spread of entrepreneurship education to all levels of the education system, which this mapping documents, means that the entrepreneurship competences of pupils and students are strengthened several times during their schooling and education. As an earlier analysis induced by the Danish Foundation for Entrepreneurship – Young Enterprise showed, this is very positive, because the more often students are taught entrepreneurship during their education, the more likely it is that they will start their own business and the higher the income they are likely to earn. This applies both to starting your own business and to being employed.



This analysis also examines the kind of entrepreneurship education implemented and the teaching methods used, which provides a good basis for measuring the effects of the teaching in the short term. It allows us to measure whether the competences that teachers and instructors are trying to strengthen in their pupils and students are actually being strengthened. In the long term these are the skills which the young people use when they start their own business or when they act as innovative and entrepreneurial employees.

The Danish Foundation for Entrepreneurship – Young Enterprise has set up projects which examine the effects of entrepreneurship education at all levels of the education system. One of them is the Edison programme for pupils in the 6th and 7th grade, which examines the immediate effect for instance on different groups of pupils. One of the questions we seek to answer is whether there is a particularly beneficial effect on academically weak pupils. Another project is a longer term study of 9th graders in which we follow a group of adolescents over a number of years. Here we look, among other things, at the attitudes and behaviour of the individual in relation to his or her aspirations, personal development, and choice of education. In the long run we will be able to measure the results in terms of new start-ups and income earned. Some of the first results of this study are that pupils who participated in entrepreneurship education are happier about school, have higher ambitions for their further education and career, and feel they can contribute to society. More recent findings are that the effects also depend on how entrepreneurship is taught. The pedagogical approach *Entrepreneurship as a method*, which focuses on encouraging non-cognitive and general skills such as pro-activeness and a

sense of initiative, tends to make pupils happier about going to school but less interested in becoming an entrepreneur. The opposite seems to be the case if the approach focuses on strengthening cognitive and special competences such as financial knowledge. Pupils who have been taught on the basis of this *Entrepreneurship as an occupation*-approach have higher intentions of becoming an entrepreneur, whereas we see a negative effect on the way they get along with their classmates and teachers and on how they feel about school in general.

International studies show that young people in upper secondary education (beginning at the end of full-time compulsory education) who participated in the Company Programme are very likely to start their own business later on. This indicates that the programme has a special effect on the ability of young people to manage uncertainty. In 2013 the Danish Foundation for Entrepreneurship – Young Enterprise completed a study of the Danish participants in Company Programme¹, which focuses on strengthening both cognitive and non-cognitive skills. We found that there is a relation between the students' perceived barriers to entrepreneurship and their intention of and interest in starting their own business. The students who assessed they had a high ability to cope with ambiguity and to marshal resources also had a higher level of entrepreneurial intentions. We also found that the *Entrepreneurship as a method*-approach seemed to appeal more to girls, whereas the more traditional *Entrepreneurship as an occupation*-approach seemed better suited for boys.

Moreover, a research study about the impact of the entrepreneurship education at university level on students' entrepreneurial self-efficacy (belief in own capabilities), intentions and behaviour is published in the beginning of 2014. Preliminary results from this study show that students in entrepreneurship programmes improve their creative skills and strengthen their entrepreneurial attitude considerably more than students who have not participated in this type of education. In addition, entrepreneurship education leads to more students starting their own business, whereas "ordinary" university education has a negative effect on the start-up of new businesses.

The impact measuring surveys of the Danish Foundation for Entrepreneurship – Young Enterprise (FFE-YE) are all longitudinal, and the goal is to build databases which can answer the many different questions, in the short as well as in the long term. The impact measuring reports may be downloaded at www.ffe-ye.dk.

The first results of the impact measurements are that entrepreneurship education has beneficial effects both on the individual and on society. It is therefore very positive that this year's mapping shows that the spread of entrepreneurship education is increasing, also in areas where there is no tradition for entrepreneurial thinking.

Mapping 2012/2013

The mapping shows the increase at all educational levels in the number of courses and participating pupils and students as well as in the areas in which entrepreneurship is mostly applied.

At the different educational institutions there are numerous initiatives which support entrepreneurship education and contribute to an entrepreneurial environment and development of entrepreneurial skills of the pupils and students. Some of these initiatives have been described and accounted for separately. At the basic school level (primary and lower secondary education) and in the upper secondary education these activities are generally part of the teaching and

¹ The Company Programme offers students aged 15 to 19 the opportunity to set up and run their own real company over the course of one academic year, with the support and guidance of a volunteer adviser from business.



therefore included in this account. At the higher education level special activities are not included in the general quantitative account unless they are part of the proper formal teaching at the individual institution.

The data have been collected in different ways at the educational levels; for instance by means of a questionnaire survey among basic school teachers, by use of lektio.dk (website for student administration at the upper secondary education), and by direct contact to the educational institutions. In all cases we have sought to avoid that pupils and students are counted more than once, but since individual data are not accessible, it cannot be completely ruled out that double counting may occur to a lesser extent.

The mapping covers the school year 2012/2013.

In this context, Entrepreneurship Education is defined from a broad understanding of entrepreneurship:

Entrepreneurship is when you act upon opportunities and ideas and transform them into value for others. The value that is created can be financial, cultural, or social.

Entrepreneurship Education is practice-oriented education which involves the surrounding community, supports creativity, and encourages initiative and action. The pupil/student is active in the learning process, which takes place by interacting with others, and the teacher acts as adviser and role model.

Entrepreneurship Education is in the broad sense about pupils and students receiving information and gaining knowledge about entrepreneurship and entrepreneurial thinking and developing their abilities to act in an entrepreneurial way.

The mapping is a quantitative account of the number of participants in entrepreneurship education at the different education segments. It provides an overview of the status at each area of education regarding teaching in entrepreneurship and shows the development over the last three years. It also clarifies which areas of education especially focus on entrepreneurship.

Primary and Lower Secondary Education

The Danish basic school covers 0th (preschool class) – 10th grade and encompasses public schools, private and independent schools, and continuation schools with a total of 693,000 pupils.

In this mapping of the spread of entrepreneurship education in basic school in the school year 2012/2013 the analysis is based on the following:

- Teaching – A questionnaire survey among teachers
- FFE-YE competitions
- FFE-YE teaching
- Number of handouts and downloads of FFE-YE education materials
- Number of participants in NEIS (Network for Entrepreneurship and Innovation in School and educations)
- Special educational activities

The result of the mapping of the spread of entrepreneurship education in basic school in 2012/2013 is that 73,470 pupils participate in entrepreneurship education and special activities. This corresponds to 10.6 % of the nearly 700,000 pupils in the Danish schools. Figure 1 illustrates the considerable increase during the last three school years.

The proportion of basic school pupils participating in entrepreneurship education and special educational activities

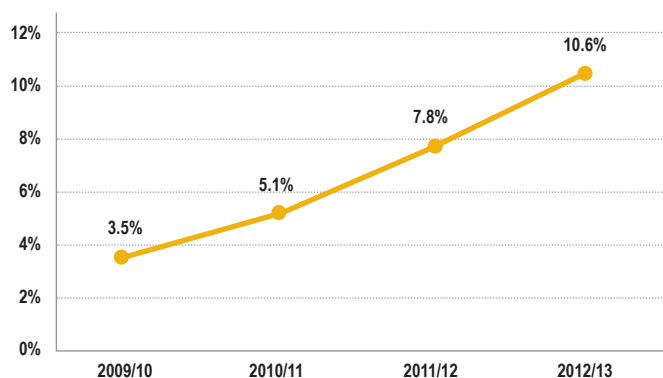


Figure 1

In the spring of 2013 the Danish government inflicted a four-week-long lockout of primary school teachers in Denmark. Because of this lockout the Danish Foundation for Entrepreneurship – Young Enterprise chose not to carry out a questionnaire survey among primary school teachers like the one that had been carried out the year before. We have therefore transferred last year's survey result to 2012/13. We find it just to use last year's result, considering it to be a minimum for 2012/13, since all other measurements in relation with entrepreneurship education in 2012/13 have resulted in increasing numbers, compared to 2011/12.

The result of the questionnaire survey in 2011/12 was that 19,004 pupils were taught entrepreneurship. This corresponded to nearly 3 % of all pupils in basic school. The numbers were obtained on the basis of the teachers' answers concerning the grades they were teaching as well as on the size of the primary school population, obtained from the Data bank of the Danish Ministry of Education. 526 teachers from 183 schools participated in the survey, that is, approximately 8 % of the country's schools participated in this survey.

The analysis shows that approximately half of the teachers participating in the survey teach entrepreneurship. A fourth of these teachers, corresponding to 12 % of the participating teachers, are focusing on the classical form of entrepreneurship, which involves teaching finance and markets (the *Entrepreneurship as an occupation-approach*).

In the other areas included in the mapping of the basic school level there is also an increase in the number of pupils. We are talking about FFE-YE competitions, handed out FFE-YE teaching material, FFE-YE education, teaching conducted by members of NEIS, as well as special activities.

The number of basic school pupils participating in entrepreneurship education and special activities

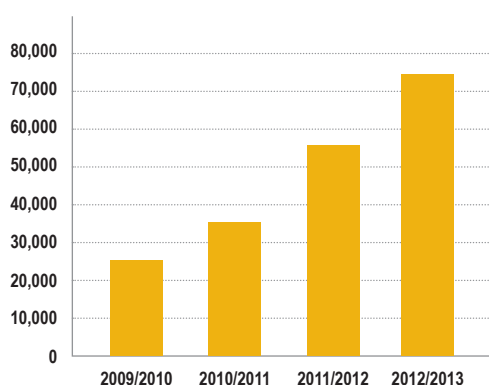


Figure 2

Entrepreneurship education is thus spreading in the Danish basic school. Over the last four school years the proportion of pupils in this kind of education/training has increased from 3.5 % to 10.6 % in 2012/2013. The number of pupils is probably a minimum rather than the total, because only a small part of the country's teachers have participated in the questionnaire survey.



Upper secondary education

Upper secondary education in Denmark comprises the upper secondary schools, the general upper secondary education (Stx), the higher preparatory examination (Hf), the higher commercial examination (Hhx), the higher technical examination (Htx) and the vocational education and training programmes as well as the basic social and health training programmes etc. (EUD). There is a total of 270,000 students in upper secondary education.

In this mapping of the spread of entrepreneurship education at the upper secondary education level in the school year 2012/2013 the analysis is based on the following:

- Teaching at the upper secondary schools and in the vocational educations
- The FFE-YE competitions Company Programme and Innovation & Design
- Number of handouts and downloads of FFE-YE teaching materials
- Special teaching activities

When it comes to formal teaching in upper secondary education, the identification of subjects and modules with an entrepreneurship content has been done by reviewing curricula. However, it does not always appear from these curricula which pedagogical method is used in teaching, and therefore the methods cannot be quantified.

In total, 85,016 students in upper secondary education participated in entrepreneurship education and special activities in 2012/2013. This number corresponds to 31.5 % of all students in upper secondary education. Figure 3 shows the development over the last three school years.

The proportion of students in entrepreneurship education and special activities

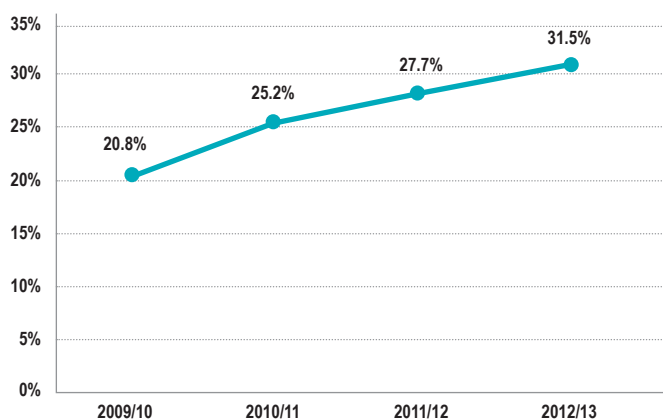


Figure 3

The mapping of the formal education at the upper secondary education level showed that 61,948 students, corresponding to 23 % of all students at the upper secondary education level, participated in entrepreneurship subjects and modules in 2012/2013, thus an increase from the 21% in 2011/2012.

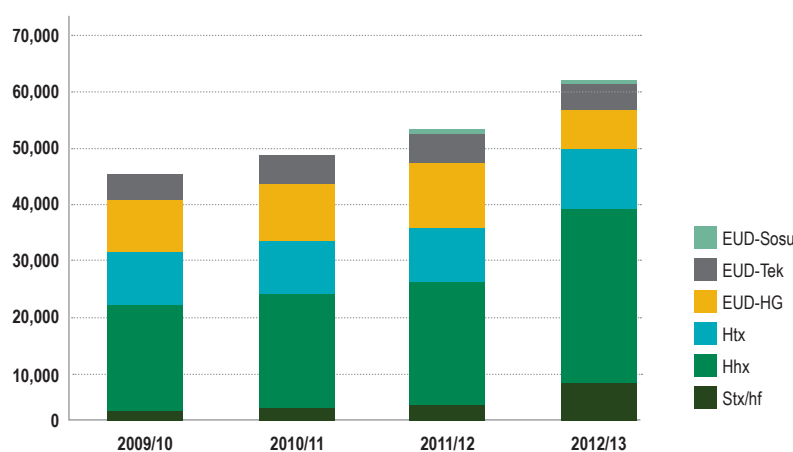
In the upper secondary schools Hhx and Htx there are compulsory subjects, which include entrepreneurship, while in Stx/Hf elective subjects are offered. Since this mapping covers one single school year, however, not all (100 %) students in Hhx and Htx may be counted as participants in entrepreneurship subjects, because the subjects are compulsory only *at some point during* their three-year education. The calculation shows 84 % participants in Hhx and 80 % in Htx. The detailed mapping of the different upper secondary schools showed an increasing interest in all three schools, counting also an increasing demand in the elective subjects in Hhx and Htx. In Stx/Hf 7.1% chose an entrepreneurship subject, while in Hhx and Htx the numbers were 18.3 % and 9.5 %, respectively.

In total, 39,754 students in the upper secondary schools, corresponding to 28 % of all 141,767 students in the Danish upper secondary schools, participated in entrepreneurship subjects.

At the vocational education level there was a total of 22,194 students from the three vocational courses EUD-Tek (technical line), EUD-HG (commercial line) and EUD-Sosu (social and health line) who participated in entrepreneurship subjects and modules. This corresponds to nearly 17.3 % of all 128,379 EUD-students in 2012/2013, which is a considerable increase from the 10.6 % in 2009/2010.

To sum up, there has been an increase in the number of students who participate in entrepreneurship education over the past four school years. The largest proportional increase is seen in EUD and Stx/Hf. From 2009/2010 to 2012/2013 there has been an overall increase of 17,500 students at the upper secondary education level, corresponding to an increase of almost 40 %.

The number of students in entrepreneurship education at the upper secondary education level



Note: Includes formal teaching.

Figure 4

Participation in FFE-YE's competitions is included in the overall mapping. The number of participants in Company Programme and Innovation & Design as a whole has grown significantly over the past years. The participants are mainly from the vocationally oriented upper secondary schools (Hhx and Htx) as well as from the commercial vocational course (EUD-HG).



Many students are taught by means of materials from FFE-YE. In the school year 2012/2013 the number of handouts reached 11,754, which is more than three times as many as in 2011/12. Since 2011/12 it has been possible to download the materials from the FFE-YE website, and the number of handouts in 2011/12 (3,616) had already then considerably increased.

All over the country students participate in special activities which increase their knowledge of and competences in entrepreneurship. In this mapping we have registered the students' participation in regional projects, competitions, camps, Opfindertjenesten², and projects supported by FFE-YE. A total of 7,767 students participated in these activities in 2012/2013.

So we also see a spreading of entrepreneurship teaching and training at the upper secondary education level in 2012/2013. As a whole, 85,016 students at the upper secondary education level participate in entrepreneurship education and special activities, which corresponds to 31.5 % of all students at this educational level (see figure 3).

² Opfindertjenesten (the Consultancy Services for Inventors) is financed by the Ministry of Science, Innovation and Higher Education and operated by the Centre for Ideas and Innovation at the Danish Technological Institute. It provides free courses for students from elementary school to university level on how ideas and inventions can be turned into value.



Higher education

Higher education in Denmark comprises the short-cycle higher non-university programmes, the medium-cycle university and non-university programmes as well as the long-cycle university programmes. The educations are offered by 9 business academies, 11 university colleges, 11 maritime institutions, 11 art colleges³ as well as 8 universities. In 2012/13 a total of 258,000 young people are registered at these institutions.

In this mapping of the spread of entrepreneurship education at the higher education institutions in 2012/2013 the analysis is built on data about the following:

- Teaching at the Danish business academies, university colleges, maritime institutions, art colleges as well as universities
- FFE-YE competition: Start Up Programme
- Special activities – Number of participants in Venture Cup⁴ and other competitions, camps, The Consultancy Services for Inventors, projects supported by FFE-YE as well as teaching activities in student incubators (the number of participants is not included in the total account).

At the higher education institutions courses, subjects and modules have been identified by reviewing curricula, descriptions of courses and subjects as well as by direct contact with the institutions. At the universities a special model for categorizing the entrepreneurship courses is used⁵.

During the past four years from 2009/2010 to 2012/2013 entrepreneurship education has spread more widely at the higher education level. 28,048 students, corresponding to 10.9 % of all 258,000 students, participated in entrepreneurship courses in 2012/2013.

³ Denmark's Design School, The Academy of Fine Arts School of Architecture and The Academy of Fine Arts School of Conservation have now merged under the name of The Royal Danish Academy of Fine Arts Schools of Architecture, Design and Conservation (KADK). In this mapping the division into three units is maintained in order to be able to compare the numbers with those of the earlier years.

⁴ Venture Cup is a business idea competition for students, graduates and faculties at the Danish universities.

⁵ Developed by the Øresund Entrepreneurship Academy and since 2007 used for mapping the entrepreneurship education at the Danish universities.

The total share of entrepreneurship students in higher education

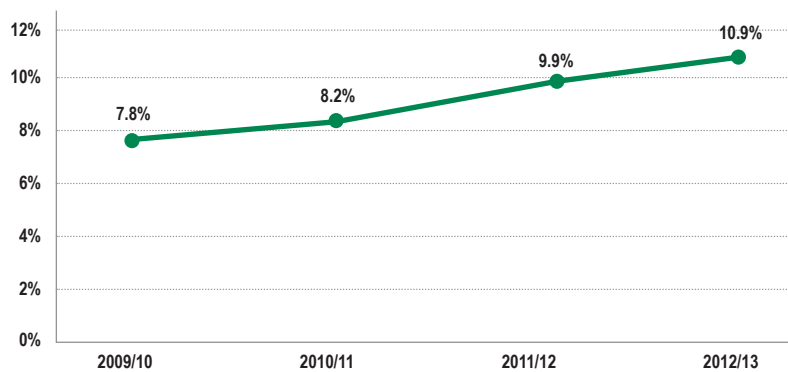
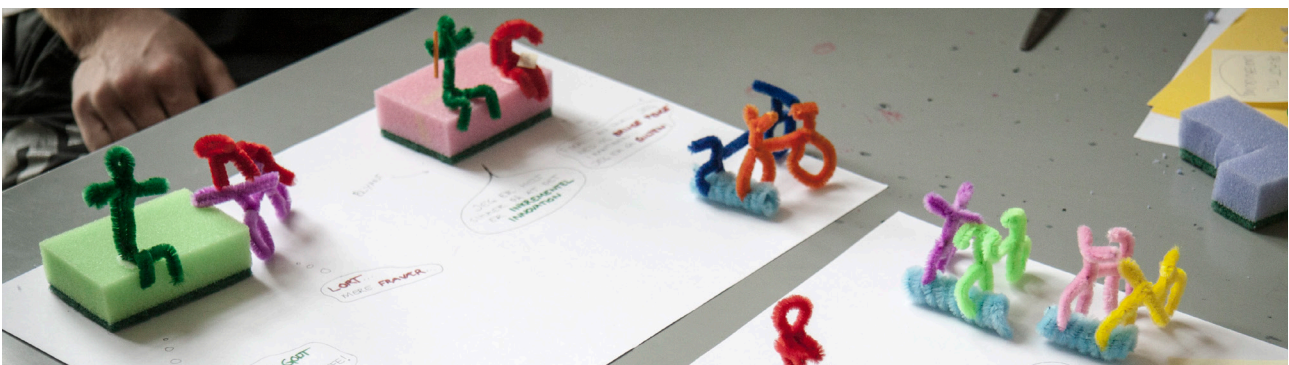


Figure 5

In 2012/2013 entrepreneurship education has spread to all 9 Danish business academies. With 96 offered courses the number stayed on the same level as in 2011/12. A total of 5,722 students participated in entrepreneurship courses in 2012/2013. Despite the same number of courses as last year, the share of participants increased by 35 % from 2011/12 to 2012/2013. The share of entrepreneurship students at the business academies has thus reached 24 %. The commercial area is clearly dominant among entrepreneurship students in the educations offered at the Danish business academies.

In almost all 11 Danish university colleges there was an increase in the number of entrepreneurship courses in 2012/2013. We have registered 165 entrepreneurship courses in the academic year 2012/2013 with a total of 10,032 students. This corresponds to 14.1 % of the approximately 71,000 students in the country's university colleges having completed an entrepreneurship course in the academic year 2012/2013. The number has increased by 145% over the past three academic years. In relation to educational areas more students (32 %) in the design professional area participate in entrepreneurship courses. Then follows the pedagogical area (26 %), where the entrepreneurship courses are offered to both student pedagogues and student teachers. Entrepreneurship is also getting more integrated in the health area (26 %), where physiotherapy students and occupational therapy students alike now participate in entrepreneurship education.

Nearly a quarter of all students in the maritime educations, that is 615, participated in entrepreneurship education in 2012/2013. Over the past three academic years this number has thus dramatically increased, from 259 in 2009/10.



In 2012/2013 32 % of all students at the artistic and cultural educational institutions participated in one of the 26 entrepreneurship courses offered by the individual institutions, including the Career Workshop at the School of Architecture in Aarhus, or by CAKI (Center for Applied Artistic Innovation). In comparison 988 students, corresponding to 18.4%, did so in 2009/2010. So, clearly more students participate in specific entrepreneurship courses in the artistic and cultural educations in 2012/2013 out of the total of 5,421 students at these institutions.

The mapping shows that 271 entrepreneurship courses were offered at the 8 Danish universities in 2012/2013, which is an increase from 236 in 2011/12. In return, there has been an increase in the number of students in each course as well as in the proportion of participating students among the total of university students. In 2012/2013 a total of 9,932 students participated in entrepreneurship courses, corresponding to 6.4 % of all university students in 2012/2013. The total number of enrolled students at the 8 universities in 2012/2013 is 154,690, which is an increase by approximately 10,000 students a year during the last two academic years. This means that although the share of entrepreneurship students thus remains at 6.4% of the total number of enrolled university students, the actual number of university students receiving entrepreneurship education is larger than last year. Summer courses have increased in popularity. It is still during fall, however, that most students participate in entrepreneurship courses and where most courses are offered. In 2012/13 there was also an increase in the number of spring courses (at RUC).

The vast majority of the entrepreneurship courses (66 %) are offered at the social science studies, followed by the technical and natural sciences (27 %) and the humanities (4%). Approximately 2 % of the courses are offered at the health sciences. However, when we compare the numbers with data from 2011/2012, it seems that entrepreneurship education is beginning to spread more evenly between the different fields of study.



The analysis shows that generally more men than women participate in entrepreneurship education at the Danish universities, so the distribution does not follow the general gender distribution among university students where women are in the majority. In the 2010/2011 mapping, for the first time, we looked at the gender distribution among participants in the entrepreneurship courses at the universities. The distribution was then 57 % men and 43 % women, while in 2012/13 the numbers are 55% men and 45% women. The gender distribution thus seems to become more even. However, we will have to compare numbers over a longer period to detect any true pattern. Additionally, it must be observed that the gender distribution also depends on the field of education; thus we would probably see a higher share of women if entrepreneurship education were spread even more to fields of education such as the health area and the humanities which still have a large female bias.

In higher education the Danish Foundation for Entrepreneurship – Young Enterprise offers the competition Start Up Programme to students at the business academies, university colleges, art colleges as well as the maritime institutions. The competitors are included in the account at the individual institutions. In 2012/2013 a total of 470 students from 8 institutions took part in the competition. This is a dramatic increase compared to the 113 participants in 2011/2012.

The below figure 6 shows the distribution of the 28,042 entrepreneurship students at the different segments of higher education. The number of entrepreneurship students at the university colleges has grown significantly, thus overtaking the number at the universities, and is now the segment with the largest number of participating students.

The distribution of participants in entrepreneurship courses at the higher education level

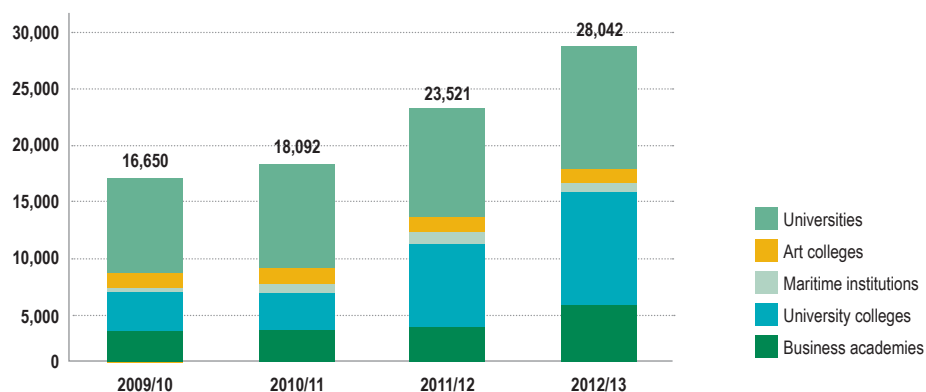


Figure 6

The range of studies offered by individual institutions in different segments and the nature of these studies, for instance how business-related they are or how practice-oriented they are, probably plays a role in relation to their offering of entrepreneurship education. In addition, one must consider culture and traditions and the individual institutions' openness to this relatively new education area. In general, entrepreneurship is fairly integrated in the range of courses offered at the commercial and technical studies. The analysis shows that entrepreneurship education is now also being included in educational areas which do not seem immediately obvious, for instance the humanities, the nutrition and health area, occupational and physical therapy as well as the pedagogical educations.



Apart from the formal education offered by the educational institutions many activities and initiatives are started up to motivate students and strengthen their competences within entrepreneurship. This year's mapping describes a number of activities under the heading 'Special activities'. Some of them are Venture Cup and other business idea competitions, innovation camps and student incubator arrangements. We know that at least 3,300 students, coming from all the higher educations, have taken part in these activities. This number is not included in the number of participants for the higher educations, because the activities are extracurricular.

The proportion of students at the higher education institutions who have participated in entrepreneurship education reached 10.9% in 2012/13 and has thus been steadily growing over the past four academic years.

Summary

The overall conclusion of this mapping which covers the school year 2012/2013 is that:

- Nearly 186,000 of the 1.2 million pupils and students in the Danish education system participated in entrepreneurship educational activities. This number corresponds to 15.3 %.

The proportion of pupils and students in entrepreneurship education and special educational activities

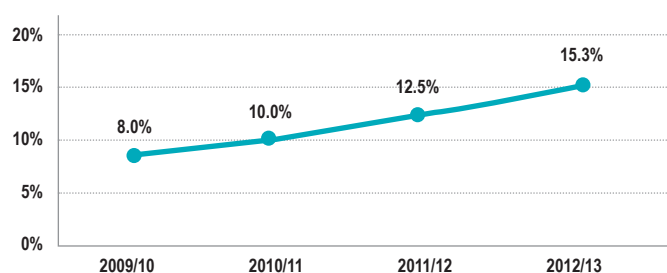
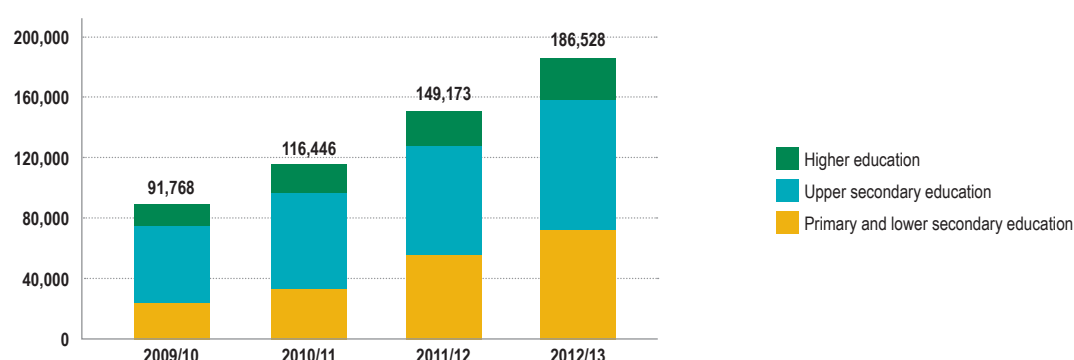


Figure 7

- 73,470 pupils, corresponding to 10.6 % of the nearly 700,000 pupils in primary and lower secondary education, participated in entrepreneurship education and special activities.
- 85,016 students, corresponding to 31.5 % of the 270,000 students in upper secondary education, participated in entrepreneurship education and special activities.
- 28,042 students, corresponding to 10.9 % of the 258,000 students in higher education, participated in entrepreneurship education.

The number of pupils and students in entrepreneurship education and special educational activities



Note: Please note that numbers for the higher education institutions only include formal education leading to ECTS-points.

Figure 8

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