

# **Entrepreneurship in higher education – impacts on graduates' entrepreneurial intentions, activity and learning outcome**

## **1. Introduction**

Entrepreneurship education has been high on the European agenda during the last ten years. Many countries, among them Norway, have launched action plans to promote entrepreneurship education. The aim of the plan is to foster innovative and entrepreneurial skills, and to encourage more young persons to establish their own enterprises. This paper is based on a survey among higher education (HE) graduates mapping among other things the extent to which the graduates have participated in different forms of entrepreneurship education during their study time. The survey forms a part of a formative research project following a Norwegian action plan for entrepreneurship in education and training with special emphasis on higher education (Ministry of Education and Research, 2010).

The survey includes questions to graduates who have experience with entrepreneurship education ('entrepreneurship graduates'), as they are asked several questions about the learning outcomes of this type of education. Further, the survey makes it possible to compare entrepreneurship graduates with other graduates in relation to the question about being self-employed and about future plans concerning establishing of their one's own enterprise.

The study builds on previous studies of the prevalence of entrepreneurship education and its importance and possible effects, which are referred to below. Still, the study is explorative as no other similar survey to our knowledge has been undertaken and there are few quantitative studies on representative samples in this field of research, at least at the European level. Thus, the study has a broad approach including several research questions.

### *1.1 Research questions*

- How many higher education graduates have undertaken different forms of entrepreneurship education during their study time? How comprehensive was the entrepreneurship education been?
- What were the specific benefits of the entrepreneurship courses?
- Are entrepreneurship graduates more frequently than to other graduates self-employed shortly after graduation? Is there a higher proportion of entrepreneurship graduates compared to other graduates who plan to start their own business in the future?

## **2. Literature review**

The last two decades have seen a tremendous growth in entrepreneurship education in higher education, especially in the United States. This is illustrated by Kuratko (2005), who also describes the social importance of entrepreneurship as nothing less than that "entrepreneurship has emerged over the past two decades as arguably the most potent economic force the world has ever experienced" (p. 577). Likewise, Mayhew *et al.* (2012) argue (p. 856) that nothing matters more for the economic welfare of any nation than effective

utilization of innovations, arguing that innovative entrepreneurs play a vital role in economic growth.

Also in Europe, the importance of entrepreneurship for economic growth is emphasized, and in most European countries, there is political support for and commitment to promoting entrepreneurship education. In particular, there has been a focus on entrepreneurship education as a follow-up to the Lisbon Declaration in 2000 (European Parliament, 2000, European Commission, 2006a). Norway hosted a European conference on entrepreneurship education in 2006, and on this basis the report "The Oslo Agenda for Entrepreneurship Education in Europe" (European Commission, 2006b) was developed. This conference was followed up with action plans in many countries. Entrepreneurship education is, however, of less importance in Europe than in the United States and Canada (NIRAS, 2008). Based on a study of the literature, Dickson et al. (2008) suggest that there is a need for more research on the topic outside the U.S. They also point out (with reference to Hannon, 2005) that there has been a dramatic increase in the supply of entrepreneurship courses at UK universities and the government's financial support for Centres of Excellence in Teaching and Learning with a focus on entrepreneurship education. Rae *et al.* (2012) also report a strong commitment to entrepreneurship in English higher education, while others, for example Piperopoulos (2012), discuss the considerable difficulties in the field of entrepreneurship to be accepted in Greek higher education.

How many students who participate in entrepreneurship education in HE is difficult to estimate because in different studies it is primarily HE institutions (HEIs) that have been asked to estimate this. NIRAS (2008) arrive at an estimate based on a survey among European HEIs that 24 per cent of the student population (five million out of 21 million students) are *currently* engaged in entrepreneurship education. This estimate is probably too high (and it is hard to find it justified in the report), and possible it is closer to an estimate of how many who might have some experience with entrepreneurship education over their study, a proportion that is much higher than the proportion engaged at a certain time ("currently"). Also based on a survey of HEIs in England, Rae *et al.* (2012) found that 16 percent of the student body participate in entrepreneurship education.

Kuratko (2005) suggests a ten point list that summarizes some of the most significant themes which are a part of entrepreneurship research and education. The list concerns mainly studies on financial and other challenges faced by entrepreneurs, women and minority entrepreneurs, ethics and entrepreneurship, and the social contribution of entrepreneurs etc., but what seems to be lacking is issues like the prevalence of entrepreneurship in HE and the possible effects of entrepreneurship education generally and on learning outcome particularly. This list seems to confirm that that there is limited research on topics dealt with in this paper.

A warning – possibly of as much interest to policy makers and HEI stakeholders as to researchers – is also presented by Kuratko: "While 'entrepreneurial' is a valid term and I use it myself, we must be careful not to allow everything to become 'entrepreneurial' simply because it sounds vogue or it fits within certain grant proposals or endowment packages" (Kuratko 2005, p. 589). Certainly, issues concerning definition are challenging in this field of research, not at least when comparing results between and across countries and with different

research designs as discussed by Dickson *et al.* (2008) as well as by Matlay in several studies (Matlay, 2005; 2006; Matley and Carey, 2007; Matlay, 2008). Matlay (2008) also describes how the number and variety of entrepreneurship courses have developed (from originally having incorporated in mainly traditional business modules) and states that entrepreneurship programmes are provided at various levels and duration.

The extent to which entrepreneurship education has effects in terms of providing entrepreneurial skills depends on whether entrepreneurship can be taught and learnt. According to many studies, entrepreneurial skills associated with entrepreneurial behaviour are learnable (Bird, 1995; Mayhew *et al.*, 2012). Rather than claiming that entrepreneurial competencies of any type can be “taught”, Bird emphasizes that they “can be fostered, facilitated, and nurtured” (Bird 1995, p. 67). According to Kuratko (2005, p. 580) it has become clear that entrepreneurship, or certain facets of it, *can* be learnt (or ‘taught’, as Kuratko puts it, as he does not here distinguish sharply between taught and learnt).

In this paper the learning outcomes of entrepreneurship education is among the issues examined. The understanding of the term ‘learning outcomes’ and how it can and/or should be measured is long debated (Karlsen, 2011). The 46 countries that participated in the Bologna process<sup>1</sup> agreed upon the following definition: “Learning outcomes describe what a learner is expected to know, understand and be able to demonstrate after successful completion of a process of learning” (European Communities, 2009). In this paper, aspects of entrepreneurial skills as well as the graduates’ entrepreneurial intentions and activity are focused which should both be considered to be in line with this definition.

What an entrepreneurship student may be expected to learn, is discussed by Jones, Matlay and Maritz (2012), using “the process of scenario development” (p. 814). Of their four scenarios, it is considered here that the first two scenarios are particularly relevant to the study in this paper. The authors see four main ways in which entrepreneurship education in higher education is positioned: (i) It is a transformative experience capable of creating an entrepreneurial mindset in all who participate. (ii) It is a supportive pathway towards business start-up and/or the specific skills required to do so. (iii) It provides skills and knowledge to students in the sciences and arts who seek to commercialize their intellectual property. (iv) It is just another subject provided by the business schools. The authors conclude that they find it difficult to dismiss the underlying purpose of each scenario, however pointing to many problems relating to each of them, e.g. the third scenario; which they assess as potentially reducing enterprise/entrepreneurship education to a highly specialized area. Further, they argue, among other things, with reference to the fourth scenario, that enterprise/entrepreneurship education can offer value to any other area of learning in higher education (other than business schools), and vice versa (p. 821). The authors argue that there is an opportunity to unite the common focus of the four scenarios on the development of a transformative student experience.

One specific learning outcome of entrepreneurship education is that it promotes entrepreneurial and innovative orientations that go beyond the question of starting up one’s own business. Thus, in the literature the concept *intrapreneurship* has emerged, frequently also referred to as “corporate entrepreneurship” (CE) and more or less the same phenomenon.

This refers to entrepreneurial activity *within* existing organizations/firms (Bjørnåli and Støren, 2012), and thus not to a (new) business establishment as otherwise is traditionally associated with entrepreneurship. *Intrapreneurial* employees demonstrate creativity in innovation-processes at the enterprise level, identify new opportunities in the market and are able to see how the firm's competencies can be used to develop new products or processes (Zahra *et al.* 1999a; 1999b; Ireland *et al.*, 2009).<sup>2</sup> The possible outcome of entrepreneurship education that is examined in this paper therefore goes beyond entrepreneurial intentions that refer to starting up one's own business, and includes innovative skills and orientations that might be exploited within existing firms/organizations.

"Innovative entrepreneurship" is a related phenomenon. Mayhew *et al.* (2012) use this term when they focus on *innovative* entrepreneurship in contrast to *replicative* entrepreneurship. Whereas the latter refers to business start-ups based on (copy of) old ideas, the *innovative* entrepreneur provides *new* products or services. These authors argue for the need for research that takes account of innovative entrepreneurship to a greater extent, in particular in studies of entrepreneurship education. Mayhew *et al.* refer to a disagreement among researchers on the question whether entrepreneurship can be taught or whether it is a personality trait such as risk-taking, and designed their study so that they were able to differentiate between personality traits and effects of higher education experiences. When controlling for such properties, their findings indicate that innovative intentions among U.S. students are largely affected by taking an entrepreneurial course as well as by specific pedagogical practices concerning assessment, for example, assessments encouraging innovative approaches to problem-solving. This fits well with findings of Bjørnåli and Støren (2012) concerning European graduates five years after graduation. They found, among other things, that the more a graduate's study programme emphasized the development of entrepreneurial skills, and the more the HE study was characterized by project- and problem-based learning as modes of teaching and learning, the higher the likelihood of the graduates being innovative at work.

Several studies are occupied with the anticipated relationship between entrepreneurship education and entrepreneurial intentions and activity. Matlay (2006) states that an analysis of the literature on entrepreneurship education and its impact upon graduate nascent entrepreneurship "has highlighted a number of definitional, conceptual and contextual difficulties that cast doubt upon the validity, comparability and generalization potential of emerging results" (p. 711). Matlay (2006) concludes that there is a need to bridge the knowledge gap that persists between the interests of stakeholders and actual entrepreneurial outcomes (p. 712).<sup>3</sup>

Dickson *et al.* (2008) suggest that the dramatic increase in entrepreneurship education is based on the assumption that this linkage must exist. Based on a comprehensive literature review they conclude that research expresses a general consensus that there is a positive correlation between entrepreneurial education and entrepreneurial activity, but Dickson *et al.* add "although not yet definitely proven" (p.250). Dickson *et al.* also suggest several methodological reasons for ambiguous findings in this research area, which is in line with the views of Matlay (2006).

Pittaway and Cope's (2007) systematic review of research on entrepreneurship education supports a conclusion that entrepreneurship education has an impact on students' intentions towards entrepreneurship; although they also maintain that it is uncertain whether it has effects on concrete entrepreneurial activity. In a study of entrepreneurship students in France, Germany and Poland (Packham *et al.*, 2010) it was found that enterprise education had a positive impact on entrepreneurial attitude of Polish students (N=59) and a small positive impact on French students (N=112) (in both countries the positive impact referred mainly to the male students), whereas it had negative impact on male German students (N=28). The students' entrepreneurial attitudes were examined prior to and after having completing an enterprise course.

A Danish study (Vestergaard *et al.*, 2012) has examined and compared attitudes towards entrepreneurship among graduate students on entrepreneurship courses and other students with very similar characteristics and backgrounds and who do similar courses; the main difference is that the latter group were not exposed to entrepreneurship teaching. (The sample included a total of 556 students). One of their findings was that 31 per cent of the first group versus 11 per cent of the latter were nascent entrepreneurs.

In the UK, Entrepreneurial Intentions (EI) surveys have been ongoing since 2002. Nabi *et al.* (2010) are reviewing the results of these surveys. The extent to which the students *definitely* have entrepreneurial intentions (have intent to start a business after university) or whether it is *probable*, is examined. In the 2007/2008 survey the total proportion with entrepreneurial intentions was 33.2 per cent – 5.7 per cent 'definitely' and 27.5 per cent 'probably'. The response pattern was the same in 2005/2006 survey, while the two previous surveys showed higher percentages. The aim of EI Surveys was not to examine the impact of HE on entrepreneurial intent and did not focus specifically on entrepreneurship education. However, the authors comment that *if* the university experience has an impact on start-up activities, this is not visible in their data. Furthermore, they consider that this is despite considerable effort to increase the numbers moving to start-up. Nabi *et al.* (2010) suggest that the EI surveys should be developed in order to investigate the effect of higher education on entrepreneurship and the possible transition from entrepreneurial intentions to actually establish a business.

A study financed by and prepared for the EU Commission (European Commission, 2012), based on a survey among HE alumni examines, among other things, the impact of entrepreneurship programmes on the intention towards entrepreneurship. The sample consisted of alumni of HEIs in Europe who had attended entrepreneurship education and a control group who had not. The survey includes responses from 2582 persons in nine different countries. The study concludes that entrepreneurship education makes a difference, those who went through this type of education displayed more entrepreneurial attitudes and intentions. One finding was that the proportion self-employed of entrepreneurship alumni was 16 per cent whereas this applied to 10 per cent of the control group. Another was that 55 per cent of entrepreneurship alumni versus 42 per cent of the control group expressed that they would prefer self-employment if they had the choice. This study discusses the possible effects of self-selection bias, i.e. that those who are interested in and who have a positive attitude towards entrepreneurship will choose to undertake entrepreneurship education. To check this,

alumni who participated in an entrepreneurship course were compared with the control group based on some personal characteristics. The results indicated the existence of a self-selection bias. It was however concluded that “the latitude of the bias seems to be small considering the relatively limited differences in personal characteristics prior to higher education. Therefore, possible effects and impact of entrepreneurship education result to a large extent from attending entrepreneurship courses and to a limited extent from the self-selection bias” (European Commission, 2012, p. 27).

### **3. Data and methods**

The analyses below are based on a graduate survey among master graduates (at least five years of HE study) from all fields, and bachelors (three years of HE studies) from the fields engineering and business and administration, graduating in the spring semester 2011. Master graduates in all fields were sampled.<sup>4</sup> The data collection took place during the period November 2011–March 2012. A total of 2827 graduates responded to the survey and the overall response rate was 50 per cent. Stratified sampling was applied for the largest groups and where the distribution of male and female graduates was very uneven (such as in engineering). The data is weighted according to the sampling procedure, and all results presented here are weighted results, except for the number of observations which refers to un-weighted numbers.

### **4. How many graduates have had entrepreneurship education during their study time?**

In order to examine how common it is to take entrepreneurship education, and the type of such education, the graduates were asked: *Would you characterise parts of, or even the entire study programme, you completed in the spring of 2011 as:*

- Education *about* entrepreneurship (providing knowledge about entrepreneurship as a social phenomenon)?
- Education *for* entrepreneurship (providing knowledge on how to establish businesses/ventures)?
- Education *through* entrepreneurship (work using entrepreneurial projects as a pedagogical method for teaching and learning)?

The graduates were also asked: During your studies, did you participate in any of the measures mentioned below?, where the five response categories were: “Young Enterprise, Student enterprise”; “Young Enterprise, Gründercamp”; “Gründerskolen (Entrepreneurship-school)”; “Take off”, and “Venture cup”.

Those who had answered yes to at least one of these questions were categorized as entrepreneurship graduates. (The term “entrepreneurship graduates” is used in the following for those who have had some experience with the entrepreneurship education during the study period.) This group was subjected to a number of follow-up questions, further described below. Table 1 shows the per cent considered as “entrepreneurship graduates”.

(Table 1 about here)

Almost 30 per cent of graduates in the survey had participated in entrepreneurship education during study. The fact that only two bachelor groups are included – business and engineering graduates – who represent groups that most frequently take entrepreneurship education, contributes to a large proportion having experience with entrepreneurship education. About half of these bachelors have such experience. Among the masters only one of five have had such experience *during their study time*. This estimate deviates considerably from that of NIRAS (2008) (see above) stating that 24 per cent of the student population were *currently* engaged in entrepreneurship education. The participating rate varied by fields of study among the masters, with master graduates in business and administration at the top (51 per cent) and masters in pedagogy/education at the bottom (11 per cent).

As expected from previous studies, female students take part in such education less frequently than males,<sup>5</sup> 23 per cent compared to 35 per cent. Due to the fact that females outnumber men in HE, the percentage of females among the graduates participating in the survey was 55 per cent. Among those who had *not* taken entrepreneurship education, the percentage of females was 59, and among the entrepreneurship graduates females constituted only 44 per cent. Otherwise, with the exception of bachelors in engineering, females were not underrepresented in any of the broad fields (■■■■ ■■■■).

#### *4.1 How comprehensive has the entrepreneurship education been?*

One question which was addressed to the entrepreneurship graduates was: “*How many credit points did these kinds of education about, for or through entrepreneurship amount to, all together?*” It is important to be aware that one academic year of full time study is equivalent to 60 credit points.

Although a relatively high share of the graduates have taken some form of entrepreneurship education, most of them have taken quite short courses. Unfortunately, a high proportion had not answered the question about how many credit points the entrepreneurship education amounted to (Table 2). In addition, a large proportion answered that entrepreneurship education was included as a course, lecture or event that could not be separated out as specific credit points (labelled ‘gatherings/measures’ in the tables and figures below). Among those who gave information on credit points, the median is 20 points.

(Table 2 about here)

#### *4.2 Education about, for, or through entrepreneurship*

The type of entrepreneurship education that is most common, particularly among the master graduates, is education *about* entrepreneurship, i.e. about entrepreneurship as a social phenomenon, tightly followed by education *for* entrepreneurship (Table 3). There is a difference according to type (level) of study. In the bachelor groups, education *for* entrepreneurship is more common than education *about* entrepreneurship. (It will be recalled that only two groups of bachelors were included in the survey, and they are not representative of all bachelors.) Many graduates have indicated more than one type of entrepreneurship

education. For instance, they had participated in education characterized as *about* entrepreneurship as well as *for* entrepreneurship.

(Table 3 about here)

## 5. The experienced concrete benefit of entrepreneurship education

The characteristics described above concerning types and scope of entrepreneurship education are essential when examining the specific benefits of entrepreneurship education. This is depicted in analyses below. First, descriptive analyses of the types of benefits that are examined will be presented.

In order to identify the more subjective experienced benefits of entrepreneurship education, the graduates were asked: *To what degree have the elements of entrepreneurship included in your education been significant in the following areas?* These areas were:

- Useful for establishing own enterprise (shortened to ‘Own enterprise’ in the figures below)
- Have provided business ideas (‘Business ideas’ in the figure below)
- Have been a good basis for establishing ‘growth company’ with several employees (‘Growth company’ below)
- Useful for getting a job (‘Getting a job’)
- Useful for performing my current job (‘Job performing’)
- Have increased my competence in terms of innovation-processes (‘Innovation-processes’)
- Useful as a mode of teaching/learning during my studies (‘Teaching/learning’)
- Increased my ability and confidence to take the initiative (‘Take the initiative’)
- Increased my creative and innovative abilities (‘Creative abilities’).

The graduates were asked to assess the benefit on a scale from ‘not at all’ (1) to ‘to a very high degree’ (5). It was not possible to use a control group<sup>6</sup> but still it seems reasonable to conclude that overall, the items received quite low scores from the entrepreneurship graduates, see Figure 1. The experienced benefit of entrepreneurship education in terms of providing business ideas etc. is rather modest, in contrast to what could be expected based on the literature reviewed above. In Figure 1 the response is ranged according to the proportion answering “to a high degree” or “to a very high degree” from the highest share to the lowest.

(Figure 1 about here)

About one third of the respondents who had undertaken entrepreneurship education informed that this education has increased their competence in terms of innovation-processes and/or increased their ability and confidence to take the initiative to a high or very high degree. Very few (15 per cent) stated that it has been important for providing business ideas. Even fewer (13 per cent) stated that it had been a good basis for establishing “growth company” with several employees.

Generally, the items “have increased my competence in terms of innovation-processes”; “increased my ability and confidence to take the initiative” and “useful as a mode of teaching/learning during my studies” have the highest scores. Such aspects should be



considered as benefit aspects connected to *generic* skills. These correspond to skills in “innovative entrepreneurship”, see Mayhew *et al.* (2012) mentioned above, and they have relatively high scores. Properties that refer to traditional entrepreneurial activity and/or intentions, or specific benefit related to current job, business ideas etc., which we suggest calling *instrumental* benefit, generally achieve lower scores.

It is likely that the experienced benefit increases with the amount of entrepreneurial education included in their higher education. Yet, quantitative empirical studies that would confirm this are to our knowledge not yet found. It is also likely that the benefit varies by type of entrepreneurship education. To analyse this further, the nine items mentioned above have to be reduced to fewer dimensions. Thus, a factor analysis of the response pattern of the nine items is conducted (see Table 4). This analysis extracts two factors which clearly show a division into generic and instrumental outcomes.

(Table 4 about here)

One of the items scores high on both dimensions (item 6; “Competence in terms of innovation-processes”). This item is therefore excluded in the next step where generic outcome is measured separately. This is done by adding the value scores on the other five items (items no. 4, 5, 7, 8, and 9) constituting factor 1, and dividing by five. The same is done for instrumental outcome by adding the value scores on the first three items which constitute Factor 2 (and dividing by three). In Figure 2 the mean scores for the two types of benefit are distributed by types of entrepreneurship education and the number of credit points in entrepreneurship education the graduate had achieved.

(Figure 2 about here)

What increases the generic versus the instrumental outcome (benefit) depends on the type as well as the scope the entrepreneurship education. Both types of benefit increase with increased amount of credit points in entrepreneurship, but this applies particularly to the generic benefit. Education *through* entrepreneurship (significantly) increases the *generic* outcome. With regard to the instrumental outcome, this is (significantly) increased through experience with education *for* entrepreneurship. When the graduate has experience with all the three forms of entrepreneurship education, the benefit is very much increased.

Not all combinations are displayed in the graph.<sup>7</sup> Here, groups who have participated in only one of the forms are considered separately so as to see the isolated effect of this form as well as a combination of all the three forms. The number of observations refers to the un-weighted number of persons in each selected group who have given response to the particular items (participated in *only* one of the forms, or in *all* three forms).

The results nuance the overall results shown above which indicated a rather modest benefit of entrepreneurship education. For some groups, depending on type and amount of entrepreneurship education, the benefit of this education *can* be quite large.

## 6. Starting up own business?

One relevant question concerning possible effects of entrepreneurship education, not at least with regard to the government's expressed intentions in action plans for entrepreneurship education, is whether graduates with such experience during HE are self-employed more frequently than others or have started up their own business. Another question is whether they plan to do so more often than others. There are severe methodological problems associated with investigating such issues, because persons who have chosen to take an entrepreneurship course can be expected to be more interested in starting up their own business than other students/graduates. Thus, a possible positive "effect" of entrepreneurship education in this respect may rather be a *selection* effect. Many studies are subject to this measurement problem. This was among the methodological issues discussed by Dickson *et al.* (2008) mentioned in the introduction to this paper.

Bearing such ambiguities in mind, Table 5 examines whether the graduates in our study more frequently than other graduates are self-employed six months or so after graduation. Here, it is taken into account that some persons have more than one job, and that many of those may have started up own business in their second job. This is important, as Edqvist *et al.* (2012) found that many entrepreneurs start their business as part-time entrepreneurs while holding another job.

(Table 5 about here)

The proportion of graduates who are self-employed or who have started their own business as their second job is *very* low (in total about 5 per cent), both among entrepreneurship graduates and other graduates. As mentioned above, if a higher proportion of entrepreneurship graduates than other graduates *had* started their own business, it would be hard to draw definitive and specific conclusions regarding the positive effects of entrepreneurship education. On the other hand, if there is a tendency towards a negative relationship, or there does not seem to be *any* relationship, it is reasonable to conclude that there is *no* positive impact of entrepreneurship education on the propensity to start up one's own business. The latter is seen in Table 5. Further, although certain reservations must be made as regards different research designs, it can be concluded that the proportion of graduates starting up their own business is very much lower in this Norwegian study than in the Danish study by Vestergaard *et al.* (2012).

However, the proportion planning or who are thinking about starting their own business in the near future might be much higher than the proportion that had done this a half year after graduation. This is examined in the survey by the question "How likely is it that, over the next five years, you will establish your own enterprise/firm?" The respondents could indicate in the range 1 "Totally unlikely" to 5 "Highly likely" or 6 "Have already established own enterprise". The percentage responding 4 ("rather likely"); 5 ("highly likely"), or 6 "have already established own enterprise") is shown Figure 3, which illustrates the overall distribution of the response to this question by fields of study among the total group of graduates in the survey. This mean share is only 13 per cent. This shows that when the scope is within five years, the proportion who plan/want to establish own enterprise is still rather low, and is lower than that found by Nabi *et al.* (2010) who assessed the share with

entrepreneurial intentions among students in UK found as low (see the literature review above).

(Figure 3 about here)

Further, master graduates in the humanities, and in sports range highest followed by masters in health and welfare, i.e. fields of study with low share of entrepreneurship graduates. Masters in “other fields” also have a high share planning to establish own enterprise. Here, it is the response from masters in “primary industries”<sup>8</sup> which is decisive. These fields are to some extent characterized by the fact that there are many in the so-called “liberal professions” (e.g. dentists and veterinarians), and some – like graduates in humanities and arts – start their own business as a response to a difficult labour market situation. The latter group has generally a more difficult labour market situation than other graduate groups (Arnesen, Støren and Wiers-Jenssen, 2012).

An obvious follow-up question is: What are the possible effects of entrepreneurship education on the graduates’ intentions to establish their own business, when controlling for fields and type of study? This is examined using logistic regression in Table 6 where the dependent variable is the likelihood (as assessed by the graduates) that they will establish their own enterprise over the next five years. If the graduate has answered “likely” (value 4) or “highly likely” (value 5) or “have already established own enterprise” (value 6) the dependent variable is coded as 1 (yes), else 0 (no).

(Table 6 about here)

Model 2 includes controls for having experience with entrepreneurship education and different lengths of it. The effects of type and fields of study remain more or less the same as in Model 1. Thus, they are robust and hardly affected by including control variables concerning entrepreneurship education. However, entrepreneurship education has significant effect on future plans, and increases the likelihood that the graduates plan to establish own enterprise. Still, estimates based on Model 2 shows that the likelihood is not very high. Among those with no entrepreneurship education the estimated probability that the graduate will start up own business is 10.4 per cent. Among those with entrepreneurship education with no credit points, the corresponding estimate is 15.7 per cent, whereas it increases to 19.1 per cent among those with 20 or more credit points in entrepreneurship (there is no effect of having 1–19 credit points in entrepreneurship).<sup>9</sup>

The graduates’ preferences were examined in another question in the survey: “If you were free to choose between different kinds of job, which would you prefer: Being an employee or being self-employed?” The response to this question showed a difference between entrepreneurship graduates and other graduates; 32 per cent of the first group would prefer to be self-employed whereas nearly 18.5 per cent in the latter group did so. Those who had taken entrepreneurship education are probably more interested in self-employment initially than the others. Thus, it is hard to see this difference as an effect of the entrepreneurship course alone, though – given the large difference – it should not be ruled out that this reflects an effect of entrepreneurship education. It is still interesting that only one third of the entrepreneurship

graduates would prefer to be self-employed if they were *free to choose*. It is also noteworthy that the proportion preferring self-employment found in this study is considerably lower than that found in the EU-study (European Commission, 2012). The response pattern with regard to the *reasons* for preferring to be employed rather than self-employed differed very little between the entrepreneurship graduates and the other graduates ( [REDACTED] ). The most common response, given by more than 80 per cent in both groups, was that they wanted “regular, fixed income”.

## 7. Discussion and conclusions

About one in five master graduates has taken part in entrepreneurship education during study time; but this proportion differed considerably between fields of study with the highest proportion among master graduates in business and administration (51 per cent). About half of the bachelor graduates in engineering and business and administration had such experience.

The results of the Norwegian graduate survey differed widely from previous European studies concerning the level of self-employment and intentions of starting up one’s own enterprise. Graduates who have had entrepreneurship education are not more frequently self-employed than other graduates. However, entrepreneurship education, particularly if it was of a certain amount (at least 20 credit points), seems to have positive effects on the graduates’ *future* plans with respect to starting their own business. The effect may partly be subject to self-selection bias. Furthermore, most graduates had taken rather short entrepreneurship courses or courses not providing credit points. Overall, also among entrepreneurship graduates, it is fairly uncommon to plan to start up one’s own business.

In general, we find lower interest by Norwegian graduates to start their own business, and less impact of entrepreneurship education than that found in other European studies (e.g. European Commission, 2012; Vestergaard *et al.*, 2012). It is difficult to determine whether differences in findings arise from different research designs. For example, the EU study in 2012 is not a representative study of European alumni. It may, however, be viewed as unlikely that the difference is only caused by different research designs. Alternatively, it may be that the findings reflect the fact that Norwegian graduates are very different from graduates in other countries. Other explanations may refer to differences in how entrepreneurship education is organized in the different countries, or to differences in the general labour market opportunities that the graduates meet in the transition from education to work. The general labour market situation in Norway in recent years has been fairly good compared to other countries (Eurostat, 2014). It is thus *possible* for the Norwegian graduates to appreciate regular and secure income and prefer to be employed rather than self-employed because of their relatively good employment opportunities.

Greater uncertainty about the labour market opportunities may lead to more graduates preferring to be self-employed in other countries where labour market problems are more severe than in Norway. However, this may also be a hasty conclusion. A general finding is that “pull factors” (or opportunity-driven entrepreneurship) are more important than “push factors” (necessity driven entrepreneurship) (European Commission, 2012; Xavier *et al.*,

2013). Overall, the mixed picture points to a need for future comparative empirical research on the effects of entrepreneurship education on entrepreneurial activity.

In addition to the findings that concern entrepreneurial activity and intentions, the reported learning outcome of the entrepreneurship education is – overall – not large. However, increased scope of entrepreneurship education increases the learning outcome in terms of innovative and/or entrepreneurial skills. Most entrepreneurship graduates have, however, participated in rather short courses.

Benefit seems to be greatest with regard to developing *generic* entrepreneurial skills, or what might be called “innovative entrepreneurship”. It is primarily participation in education *through* entrepreneurship that increases the outcome in terms of such generic entrepreneurial or innovative skills. This can be important information for the future development of entrepreneurship education. Participation in education *for* entrepreneurship tends in turn to increase the *instrumental* outcome, in that this education, to some extent, was helpful in starting their own business or gave business ideas.

Since the study indicates small effects of entrepreneurship education, an obvious question is whether the focus on entrepreneurship education in action plans and so forth, is futile. The answer is not necessarily “yes”. The study can say little about the quality of entrepreneurship education in terms of academic content and teaching and learning methods. It is likely that there is potential for improvement in many of the courses, and this should be a matter for future research. Moreover, the fact that the overall results indicate that relatively little interest exists in starting one’s own business among graduates does not imply that entrepreneurship education does not contribute to an ‘entrepreneurial mindset’ (cf. Jones *et al.* 2012), innovative activity and innovation in existing businesses (*intrapreneurship*). Based on the results discussed here, there is much to suggest that entrepreneurship education primarily has *other* effects than increasing start-up enterprises among graduates.

An overall result is that it is mainly long courses that have an impact on the different variables studied here, while for most entrepreneurship graduates the element of entrepreneurship represents a relatively small part of their HE study. A relevant policy-oriented question is whether it would make more sense for some students to take a more *comprehensive* entrepreneurship education rather than that many more students taking *some* entrepreneurship education. Action plans for entrepreneurship education tend, however, to emphasise the latter.

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<sup>1</sup> For more information on the Bologna process, see <http://www.ond.vlaanderen.be/hogeronderwijs/bologna/>.

<sup>2</sup> The term ‘corporate entrepreneurship’ is used by e.g. Zahra *et al.* (1999a; b); Ireland *et al.* (2009) and Hayton and Kelly (2006).

<sup>3</sup> Concerning *the interests of stakeholders*, Matlay (2011) shows that different types of stakeholder have influence in developing enterprising graduates in UK higher education institutions. The primary stakeholders (i.e. students, teaching staff, administrators), representing both the supply and demand sides of entrepreneurship education, are most influential, while secondary stakeholder (parents, alumni, entrepreneurs, future employers) and tertiary stakeholders (representatives of government, industry, commerce) have less influence. The author recommends (p. 179) that government and its representatives focus their policies, initiative and support measures upon specific knowledge and skills needs of students, in order to increase the relevance, effectiveness and success rate of entrepreneurship education.

<sup>4</sup> One exception is medical graduates, who were doing internship at the time of the survey.

<sup>5</sup> The gender perspective is not focused particularly in this paper, though it is shown in many studies, also Nordic studies, such as Spilling (2005); Berglann *et al.* (2011), and Edqvist (2012), that females are underrepresented among entrepreneurs. The reason is that this issue is in itself such an intriguing and extensive question that it cannot be properly treated within the scope of this paper.

<sup>6</sup> A control group could (theoretically) consist of other graduates who had also taken entrepreneurship education, for example in another country; at another time; with different modes of teaching and learning etc., which were not practicable.

<sup>7</sup> In order avoid overloading the graph with information results for persons who have not given information on credit points, or who have participated in courses/measures not providing credit points, or who have experience with different combination with e.g. *about* and *for* entrepreneurship, is not displayed.

<sup>8</sup> ‘Other fields’ include primary industries; i.e. forestry, agriculture and fishery, as well as the field transport and communications, safety and security and other services.

<sup>9</sup> The estimates are made according to the formula  $P = e^z / (1 + e^z)$  where P is the probability of establishing one’s own business, and Z = the intercept plus the effects of the independent variables ( $z = B_0 + B_1X_1 + B_2X_2 \dots$ ). Further, the estimates refer to graduates who are assigned average values on all variables included in the regression model except the variables in question, i.e. variables referring to credit points in entrepreneurship.