International Review of Entrepreneurship, Article #1618, 18(1): pp. 1-32.

When Less Is More: Why Limited Entrepreneurship Education May Result in Better Entrepreneurial Outcomes

Niklas Elert[1]

Research Institute for Industrial Economics (IFN), Stockholm, Sweden

Karolin Sjöö

Department of Technology Management and Economics, Chalmers University of Technology, Gothenburg, Sweden

Karl Wennberg

Institute for Analytical Sociology (IAS), Linköping University, Norrköping, Sweden & Ratio, Stockholm

Abstract. Entrepreneurship research suggests that entrepreneurship education and training can bridge the gender gap in entrepreneurship, but little empirical research exists assessing the validity and impact of such initiatives. We examine a large government-sponsored entrepreneurship education program aimed at university students in Sweden. While a pre-study indicates that longer university courses are associated with short-term outcomes such as increased self-efficacy and entrepreneurial intentions, results from a more comprehensive study using a pre-post design suggest little effect from these extensive courses on long-term outcomes such as new venture creation and entrepreneurial income. In contrast, we do find positive effects on these long-term outcomes from more limited but more specific training interventions, especially for women. Our study suggests that less extensive but more tailored interventions can be more beneficial than longer or more extensive interventions in promoting entrepreneurship in general, and entrepreneurship of underrepresented groups in particular. We discuss implications for theory, education, and policy.

Keywords: entrepreneurship education, propensity score matching, performance, gender.

Acknowledgement: We are grateful for developmental comments from Björn Falkenhall, Barbro Widerstedt, Kåre Moberg, Tomas Karlsson, Martin Lackeus, and seminar participants at the 2018 USASBE conference, the Max Planck Institute for Innovation and Competition in Munich, and the Frisch Center of Economics Research, University of Oslo. Financial and developmental support from the Swedish Agency for Growth Policy Analysis (Tillväxtanalys) is gratefully acknowledged. Niklas Elert is grateful for financial support from the Jan Wallander and Tom Hedelius Foundation and the Marianne and Marcus Wallenberg Foundation.

1. Correspondence: Niklas Elert, Research Institute for Industrial Economics (IFN), Grevgatan 34, 102 15 Stockholm, Sweden (SE), phone: +46-703-902751, e-mail: niklas.elert@ifn.se.

1. Introduction

Entrepreneurship education is increasingly seen as a powerful engine of social and economic transformation (Fayolle et al. 2016), but the extent to which entrepreneurship can be fostered through education and training remains contested (Levie et al. 2014). Conceptual work in entrepreneurship and gender research suggests that education and training efforts aimed at women may serve to bridge the gender gap in entrepreneurship (e.g. Ahl, 2004; Foss et al. 2019; Westhead and Solesvik 2016). However, to date there is a dearth of empirical research assessing the validity and impact of such interventions. Notably, results are mixed from studies focusing on gender differences in how education and training efforts shape participants' entrepreneurial intentions or self-efficacy (Westhead and Solesvik 2016; Wilson et al. 2007). To our knowledge, no study to date examines the potential of education and training efforts aimed at women to bridge the gender gap in actual entrepreneurial behavior such as starting and successfully running a new venture.

More generally, meta-analytical studies suggest a positive relationship between entrepreneurship education and proximal outcomes like entrepreneurial knowledge, skills, perceptions, and intentions (Bae et al. 2014; Martin et al. 2013) and distal outcomes like new venture creation, income from entrepreneurship, and venture performance (Martin et al. 2013). However, recent experimental and quasi-experimental studies suggest that the causal effects of entrepreneurship education and training (EET) are often small or non-existent (Astebro and Hoos 2016; Oosterbeek et al. 2010; Von Graevenitz et al. 2010).

Consequently, research has a long way to go before we fully understand the conditions under which entrepreneurship education is beneficial, especially for underrepresented groups (Nabi et al. 2017). In a recent literature review, Loi et al. (2016) therefore argued that future EET research focus specifically on distal outcomes such as new venture creation or entrepreneurial performance. An additional gap is that characteristics of education programs, such as their length and scope, are seldom considered (Martin et al. 2013). Specifically, research has paid scant attention to interventions designed explicitly for women even though gender differences seem to exist regarding participants' learning from EET (Wilson et al. 2007).

We seek to fill these gaps by studying a government-sponsored broad-reaching EET program for Swedish university students, aiming to integrate entrepreneurship as a topic in various educational options to make it visible as a possible career path for university students, notably women. The program is indicative of the growing orientation toward broader student groups outside of the business school context (Hindle 2007; Kirby 2004) incorporating elements from experiential and problem-based learning into entrepreneurship education (Matlay et al. 2012). It contained two broad categories of interventions: (1) those that took the form of university courses providing full course credits, and (2) those that took

the form of workshops, inspirational lectures, idea contests, etc., which we label 'limited training interventions'. While the program's main purpose was to promote female entrepreneurship, male students were free to take part in interventions and many did—providing a suitable setting for a comparative study.

Drawing on human capital theory and gender role theory, we formulate hypotheses regarding the effects of more or less extensive EET interventions and the moderating effect of gender-specific role modeling for outcomes among male and female participants. We theorize on the potentially non-linear effects of EET on the development of entrepreneurial human capital, specifically in terms of distal EET outcomes. Further, we discuss how specifically designed interventions may serve to overcome the gender normative stereotypes prevalent in entrepreneurial discourses (Ahl 2004; Foss et al. 2019; Westhead and Solesvik 2016). In doing so, we examine plausible reasons for discrepancies in EET effects between previous studies.

While a pre-study indicates that university courses are positively associated with proximal outcomes such as increased self-efficacy and entrepreneurial intentions, results from a more comprehensive study using a pre-post design suggest little effect from these courses on long-term outcomes such as new venture creation and entrepreneurial income, but positive effects from more limited training interventions, especially for women. The findings suggest that EET may be more effective when delivered as shorter, practice-based or inspirational interventions rather than as theoretically oriented education in a classroom setting, especially for participants from underrepresented groups that may face statistical discrimination (Malmström et al. 2017).

This study contributes to entrepreneurship education research in three main ways, providing insights which we believe bring us somewhat closer to the realization of Fayolle's (2013, p. 700) vision that "entrepreneurship outcomes should adequately meet the social and economic needs of all the stakeholders involved (pupils, students, families, organizations and countries)". First, while human capital development is a common theory in EET studies (Martin et al. 2013), we attend to one of the theory's basic tenets—the potential attenuating effect of human capital investments (Becker 1964; Frazis and Loewenstein 2005) —which has scarcely been attended to in the past literature. Second, we provide new insights on how distinct types of EETs may affect male and female participant differently. The study highlights how interventions tailored to enhance participants' motivation using e.g. role models may serve to bridge the gender gap in entrepreneurship. As such, it provides much-needed empirical support for arguments in conceptual work on gender discrepancies in entrepreneurship (e.g. Ahl 2004) and more specifically in entrepreneurship education (e.g. Foss et al. 2019). Finally, our study highlights the importance of investigating long-term outcomes of EET interventions rather than the more commonly used proximal outcomes.

2. Theory - Learning and Entrepreneurship Education and Training

In recent years, universities have sought to include EET in their curricula. According to Fayolle et al. (2006, p. 702), entrepreneurship education consists of "any pedagogical (program) or process of education for entrepreneurial attitudes and skills". The logic of EET investments are supported by meta-analyses indicating that EET usually enhances entrepreneurial human capital, intentions, new venture creation, and performance (Bae et al. 2014; Martin et al. 2013). Studies have also found EET programs to have a positive effect on proximal outcomes, such as participants' ability to discover opportunities (DeTienne and Chandler 2004), their attitudes toward entrepreneurship (Souitaris et al. 2007), or entrepreneurial intentions (Souitaris et al. 2007). In the long term, it seems that EET programs may substantially enhance participants' non-cognitive entrepreneurial skills (Rosendahl Huber et al. 2014) and increase their likelihood of engaging in entrepreneurship years after program participation (Elert et al. 2015). At the same time, experimental and quasi-experimental studies have found EET programs to often exhibit small or even non-existent effects in the short term (Astebro and Hoos 2016; Oosterbeek et al. 2010; Von Graevenitz et al. 2010).

These mixed results could stem from a variety of sources; after all, it has recently been suggested that entrepreneurship education is a broad label housing a hodgepodge of research and teaching (Thrane et al. 2016, p. 906). A primary distinction is whether outcomes are assessed in the short- or long-term: Most published EET studies focuses on proximal outcomes measured soon after intervention, such as entrepreneurial self-efficacy or entrepreneurial intentions (Chen et al. 1998; McGee et al. 2009), with intentions in particular being a common outcome (Fayolle and Liñán 2014; Loi et al. 2016). Fewer studies consider more distal outcomes such as actual entrepreneurial behavior in terms of new venture creation and performance (Martin et al. 2013), but the studies that do often find these to be enhanced by EET, especially in long-term follow-ups (Elert et al. 2015; Rauch and Hulsink 2015). For this reason, our primary focus is on two long-term outcomes from the EET interventions studied: new venture creation and entrepreneurial income.

Two other overlooked reasons for the mixed results may be (1) the often substantial differences between EET interventions (Martin et al. 2013), such as those providing "standard classes" toward those enabling students to pursue more personally relevant opportunities (Fayolle et al. 2016), and (2) the gender differences in terms of female and male participants' learning from EET (Wilson et al. 2007). Below we first draw on human capital theory to form a baseline hypothesis concerning the relationship between EET and long-term entrepreneurial outcomes, and a second hypothesis regarding the differing effects of more or less extensive EET interventions. We then present the theoretical arguments underpinning our third hypothesis of how interventions specifically

designed for women may specifically enhance female participants' benefit from EET interventions.

2.1. Human Capital Development through Entrepreneurship Education and Training

A common starting point for theorizing on the impact of EET is human capital theory (Bae et al. 2014; Martin et al. 2013), its central tenet being that individuals invest in training and education to enhance their career prospects and expected future earnings (Becker 1964; Bosma et al. 2004; Debrulle et al. 2012). Entrepreneurship research has studied the links between human capital, venture founding and success, but results are inconsistent (Unger et al. 2011); while individuals with better education and experience seem to have greater entrepreneurial intentions (Kim et al. 2006), "educational credentials are not simple determinants of the skills and competence relevant to entrepreneurial success" (Jayawarna et al. 2014, p. 920). This may be because human capital, though commonly treated as a fixed attribute that can be measured through the level of education or the number of years of work experience, is a heterogeneous concept.

Implicit in EET is that not all types of education are alike: Formal education qualifications may create more attractive opportunities for waged employment, but not necessarily for entrepreneurship (Jayawarna et al. 2014). Qualified experience and social skills could even be more important to successful business venturing than formal education (Johannisson 1991). This stresses the need to make a distinction between general and specific human capital (Ucbasaran et al. 2008; Hsu 2007). General human capital refers to skills that are useful and transposable across a wide range of occupational and economic settings (Debrulle et al. 2012), and emerges largely from prior formal education and management experience (Becker 1964). Specific human capital relates to narrower settings, such as direct venture or start-up experience (Ucbasaran et al. 2008), and is, in view of its more limited scope of applicability, more likely to be stimulated through EET efforts: Entrepreneurs investing in creativity and innovation can develop their specific human capital to become better able to exploit opportunities (Robson et al. 2012). Just as prior business experience can potentially provide valuable specific human capital for entrepreneurs, so can EET, especially if courses encompass learning through the transformation of experience from an authentic entrepreneurial process (Rae 2010).

When designed to increase entrepreneurial knowledge, experience, and skills, EET interventions can be seen as investments in specific human capital. If successful, they should increase participants' entrepreneurship-specific human capital (Souitaris et al. 2007; Unger et al. 2011) and result in higher likelihood to engage in entrepreneurship and/or higher entrepreneurial performance among

participants (Martin et al. 2013). Therefore, in line with previous reviews in the EET literature (Pittaway and Cope 2007), we expect a positive relationship between EET and distal entrepreneurial outcomes:

Hypothesis 1: EET participation will increase participants' likelihood of engaging in new business venturing (H1a) and, for those who do, increase their entrepreneurial earnings (H1b).

2.2. The Attenuating Nature of Entrepreneurial Human Capital Investments

Seldom considered in the EET literature is the fact that education and training are often subject to diminishing returns. If education only moderately correlates with the outcome of interest, human capital theory posits that the initial, positive effect will decline as education continues (Frazis and Loewenstein 2005; Psacharopoulos 2006).[2] Such a pattern may arise for EET due to the inherent uncertainty of the entrepreneurial process, where it is all but impossible to foresee what specific skills are needed ex ante (Eesley and Wang 2017). If EET is subject to diminishing returns, additional training and education will only be effective up to a certain threshold: Students will keep learning as long as they are exposed to new events and can interpret and build knowledge from these events (Morris et al. 2012), but will be unable to develop their level of entrepreneurial knowledge beyond the threshold. If this is the case, the relationship between additional EET and entrepreneurial skills should level off or even turn negative if more education only makes students more aware of their learning gaps (Hahn et al. 2017).

The relationship between the degree of EET exposure and entrepreneurial outcomes has received little attention in the EET literature to date, but some evidence hints at a negative relationship between entrepreneurial outcomes and high level of EET exposure (Menzies and Paradi 2003). In a recent study, Hahn et al. (2017) investigated exposure to various EET efforts in a large sample of students, finding that exposure to more EET efforts has positive effects up to a point, after which the positive effect of more exposure levels off and becomes negative. However, their outcome variable is limited to students' perceived entrepreneurial learning, and the authors' measure of EET ranges from educational initiatives to tangible support, leading the authors to suggest that "future research could use more elaborated measures of EE," such as "weighing each offering by number of credits attached" (p. 968). In sum, little is known about how the degree of exposure affects entrepreneurial learning and whether longer or more extensive EET yields "more" or "better" distal entrepreneurial outcomes, but basic human capital theory suggests an attenuating effect of human

2. The literature on organizational learning curves makes similar predictions (Epple et al. 1991).

capital investments (i.e. more education) on individual performance outcomes as a result of those investments (e.g. Psacharopoulos 2006). We thus hypothesize:

Hypothesis 2: Less extensive EET participation will increase participants' new business venturing (H2a) and entrepreneurial earnings (H2b) more than extensive EET participation.

2.3. Gender Differences in the Effects of EET: Female Role Model Effects

An important contingency in terms of EET effectiveness is the potential presence of gender differences in female and male participants' learning from EET (Bae et al. 2014; Wilson et al. 2007). Traditionally, women have been associated with lower levels of human capital in terms of education and training indicators (Becker 1993). In many contexts, male and female entrepreneurs are often noted as exhibiting differing levels and types of human capital (Shaw et al. 2009), with females generally having fewer contacts and a greater difficulty at assembling resources (Cooper et al. 1994; Robson et al. 2012). It also appears that women run smaller companies, earn less and have shorter times of involvement, though they also seem happier in their entrepreneurial role (Bögenhold and Klinglmair 2015).

That said, the entrepreneurship literature has also been criticized for an approach to gender that merely consists of comparing men and women, paying little or no attention to constructions of gender (Henry et al. 2016), and calls have been made for more sophisticated consideration of gender to analyze the multiplicity of its effects on entrepreneurial activity (Marlow and Martinez Dy 2018). While studies have attended to gender differences in general EET programs, there has been scant attention on how interventions designed for women may moderate such gender differences (DeTienne and Chandler 2007). A recent study by Westhead and Solesvik (2016) compared Norwegian business students participating in EET and found that while male EET students reported greater entrepreneurial intentions, women were significantly less likely to do so. Contrasting evidence was provided by Wilson et al. (2007) in a study of MBA students in the US which found that the relationship between entrepreneurial education and entrepreneurial self-efficacy was moderated by gender, with EET resulting in a greater increase in entrepreneurial self-efficacy for women than for men. The authors argue that their findings support the importance of well-designed education in expanding the perceived entrepreneurial career options of women.

How women and men benefit from human capital investments—for example, participation in EET programs—can be shaped by gender-role stereotypes: implicit or explicit preferences stemming from gender-related characteristics associated with tasks (Gupta et al. 2009). While evidence suggests gender differences to be negligible for entrepreneurial performance (e.g. Bellu 1993; Du

Rietz and Henrekson 2000), being female is in fact likely to affect the entire entrepreneurial experience, from the initiation of a firm and beyond (Marlow 1997). Notably, women have been found to often pay more attention to their entrepreneurial ignorance than men and to be more likely to seek training before engaging in new venture creation (Gupta et al. 2008; Gupta et al. 2014), patterns that have been used to explain implicit ideas that men are better equipped to start and run businesses (Carter and Rosa 1998). Gender-role stereotypes in entrepreneurship are pronounced even in relatively gender-egalitarian societies like Sweden (Ahl 2004; Foss et al. 2019).

The "gendering" of human capital accumulation means that EET interventions may affect the entrepreneurial behavior of men and women differently unless stereotyping can be avoided (Klyver et al. 2013). Men have abundant exposure to role models in newspapers, media, and case studies (Aldrich and Yang 2012), and the extent to which female EET participants are exposed to female role models can moderate their implicit belief in societal stereotypes, for example by showing them that female entrepreneurs exist and can be successful (Gupta et al. 2009). Few EET studies to date study gender distinctions, but those that do often show substantial differences (Fairlie et al. 2015; Oosterbeek et al. 2010; Wilson et al. 2007). In support of the role model argument, a study by BarNir et al. (2011) surveying university students showed that exposure to entrepreneurial role models had a stronger influence on women's entrepreneurial self-efficacy, which in turn influenced their entrepreneurial career intentions. Arguing for gender-role expectancies, BarNir and colleagues concluded that female EET participants were more open to input from role models than men.

Due to prevailing gender-role expectancies, we posit that EET interventions emphasizing mix-gender role models are theoretically more effective for women. In the program under study, the less extensive interventions are the ones that emphasize such models (see Section 3). We therefore hypothesize:

Hypothesis 3: Less extensive EET participation in programs emphasizing mix-gender role models will increase participants' new business venturing (H3a) and entrepreneurial earnings (H3b) more for women than for men.

3. Study Context: The EET Program "Entrepreneurship in Higher Education 2011-2014"

Educators have adopted a range of methods to connect conceptual knowledge to entrepreneurial skills, such as conventional lectures, seminars, workshops, focus groups, and peer mentoring, which are employed in a range of academic programs (Pittaway and Cope, 2007). Scholars also argue that students in non-business

education programs need entrepreneurial knowledge because they often lack the business skills to turn their ideas into viable businesses (Mustar, 2009).

In 2007, the Swedish Agency for Economic and Regional Growth (SAERG) launched the Entrepreneurship in Higher Education program as an effort under the overarching program Promoting Women's Entrepreneurship (Ministry of Enterprise and Innovation, 2007). The program aimed to "integrate entrepreneurship as a topic in various educational options in order to make it visible as a possible career path for students" (SAERG, 2015a, b). Specifically, one program goal was to increase the number of students engaging in new ventures by starting a business with a specific focus on female students (SAERG, 2015a).

The program interventions broadly aimed to enable the participants to develop their entrepreneurial abilities during their university years, equipping them with the necessary knowledge and tools to explore a business idea. A feature in many limited training interventions is that they exposed students primarily to female lecturers and mentors, a feature which is quite rare in EET studies. Even though the program primarily targeted women, about a third of all participants were men,[3] making the program an interesting setting to test differing effects of EET interventions for men and women.

We investigate the second period of the program (2011–2014), including 15 different projects at different universities (summarized in Table A1 in the Appendix). A total of 2,148 participants with social security numbers were identified in the reports that project owners submitted to SAERG, reduced to 1,919 when we removed people who had moved abroad or died. An additional 28 could not be matched to Statistics Sweden's databases, reducing the sample in the main analysis to 1,891.

The interventions we investigate reflect the diversity and eclecticism of EET noted in previous research (Fayolle et al., 2016); they differ in terms of duration, structure, and content. Some targeted only a handful of students while others, such as motivational talks, filled large auditoriums. To make an analysis of the heterogeneous interventions feasible we grouped them into two rough types based on their scope and length. Scope refers to the extent of traditional theoretical teaching on topics like how to recognize an opportunity and how to plan, finance, market, and grow a business.

The first type of intervention comprises university courses, in which 1,092 individuals took part (1,064 of whom could be matched to Statistics Sweden's databases). The second type comprises shorter interventions which we label "limited training interventions", in which 827 individuals took part (all of whom could be matched to Statistics Sweden's databases).

3. Affirmative action is prohibited in Sweden, meaning that even though the programs were specifically marketed toward female students and several had names like 'Support and inspiration for girls in entrepreneurship' (See Table A1 in Appendix), male students were admitted to the interventions on equal merits.

Table 1. Examples of university course interventions

Course name	Location	Credits	Level	Requirement	Mandatory
Textile project and business development	Borås University	15 ECTS	BSc	Registered in textile product development and entrepreneurship (180 ECTS)	Yes
Entrepreneurship and business development	Borås University	15 ECTS	BSc		Yes
Entrepreneurship focused on health promotion	Linnaeus University	15 ECTS	BSc	120 ECTS in health science (180 ECTS)	Yes
Entrepreneurship focused on health sciences	Linnaeus University	7.5 ECTS	BSc	Basic eligibility and 60 ECTS credits in biomedical science	No
Business development and personal entrepreneurship	Linnaeus University	7.5 ECTS	BSc	15 prior ECTS credits in business administration	No
Entrepreneurship and business development	Linnaeus University	7.5 ECTS	BSc	30 prior ECTS in business administration	No

Note. ECTS = European Credit Transfer and Accumulation System.

The university course interventions are shown in Table 1. Half of the courses were equivalent to 10 weeks of full-time study (worth 15 ECTS points), the other half five weeks of full-time study (worth 7.5 ECTS points). The courses all contained a mix of theoretical and practical elements. Theory elements tended to be extensive with a traditional curriculum including lectures and case exercises. All courses included some basic practical application of skills and the development of a business plan, live cases, and projects. Only one course (textile project and business development) required the students to go "live" by starting a venture. The two courses on entrepreneurship in health promotion and entrepreneurship in health science focused on the specificities of the health sector, while the course business development and personal entrepreneurship focused on social entrepreneurship in addition to for-profit entrepreneurship.

Table 2. Examples of limited training interventions

Activity	Type	Mandatory
Motivational talk	Extracurricular activity	No
Creativity workshop and exercise	Extracurricular activity / part of university program	No
Introductory lecture and seminar	Part of university course	No
Idea and business model contest	Extracurricular activity	No

Interviews with program directors indicate that the limited training interventions were less comprehensive than the university courses and comprised a more diverse set of activities. Some advertised to all students on campus while others targeted primarily female students (but admitted men). The limited interventions are divided into four categories listed in Table 2. Their duration differed: motivational talks typically lasted a couple of hours, creativity workshops and exercises lasted about half a day, and introductory lectures and seminars lasted between two and four hours. Among the limited training interventions, only the introductory lectures and seminars included an

introduction to concepts and theories about entrepreneurship. The lectures were given to students studying to work in education, media and communication, human resource management, pharmacology, etc., and were typically given by female lecturers so as not to invoke gender stereotypes. Likewise, successful female entrepreneurs were typically invited to give motivational talks (on topics ranging from "being entrepreneurship oriented" to "business attitude training"), in order to inspire and motivate female students to pursue entrepreneurship.

This overview shows that the educational ìtreatmentî differs between these two groups in that the university courses provided longer, qualitatively different, and more extensive treatment than the limited training interventions. Also, the latter focused on female role models. Since we wish to gauge the relative impact of different types of entrepreneurship interventions, we separate the effects of the two types of interventions.

4. Pre-Study: Self-Efficacy and Entrepreneurial Intentions of University Course Participants

A strong research tradition has theorized that entrepreneurship is an intentionally planned behavior (Krueger et al. 2000; Van Gelderen et al. 2018), and studies of EET have frequently evaluated outcomes in terms of higher intentions or self-efficacy. While the main study focuses on distal outcomes, the purpose of the pre-study is to explore the relationship between EET and these proximal outcomes, and gain insights into psychological items which we cannot observe in the register data.

The pre-study draws on a survey sent to university course participants and a control group of similar individuals to gain insights into the subsequent panel data study. The survey is based on Moberg's (2013) synthesis of questions from two previous studies of entrepreneurial self-efficacy (Chen et al. 1998; McGee et al. 2009). Respondents were asked to answer questions like "How certain are you of your ability to . . .?" by assigning a number on a Likert scale from 1 (not at all certain) to 7 (very certain).

The survey consisted of 29 questions related to entrepreneurial self-efficacy divided into five areas by Moberg (2013): (1) searching/creativity, (2) planning/management, (3) marshalling, (4) managing ambiguity, and (5) financial knowledge (cf. Athayde and Hart 2012). Also included were three questions from McGee et al. (2009) meant to reveal attitudes about different entrepreneurial activities (Questions 30–32), and five questions to determine whether individuals were nascent entrepreneurs (Questions 33–37 [cf. Alsos and Kolvereid 1998]). These questions were also measured on a scale from 1 to 7.

The survey was distributed by post to 1,991 people, 1,092 of whom (55 percent) had taken part in one of the six university course interventions described in Table 1.[4] The remaining 899 people (45 percent) formed the control group,

consisting of students who attended the same educational program as the participants but who either chose not to take the course (if it was voluntary) or took the program before the course was included (if it was mandatory). Sent by regular mail, the invitation contained a link to the survey online. After two reminders, the response rate reached 21.7 percent in the participant group and 22.4 percent in the control group. Table 3 below summarizes the responses to all questions, providing means for respondents in the participant and the control groups. T-tests of mean differences between the two groups indicate that they are statistically significant only for six questions. In these cases, participants exhibit higher scores than the control group, but these differences never exceed 0.31 on a seven-point scale. Statistically significant differences occur with regard to the individuals' confidence in their ability to improvise (Question 18), combine new resources (Question 1), find creative ways of getting things done (Question 5), lead and manage a team (Question 10), conduct analysis for a project that aims to solve a problem (Question 7), and identify opportunities for new ways to conduct activities (Question 4). While program participants have slightly higher entrepreneurial attitudes and intentions than the control group, only in one case is there a statistically significant difference between the two groups: whether the individual is willing to work hard to set up his or her own business (Question 34).

Table 3. Survey questions

A. Efficacy. How much confidence do you have in your ability to . . . ? (Low [1]– High [7])	**Control group (n=200)**	**Participant group (n=236)**	**t-value**
(1) Searching/creativity			
1. Identify ways to combine resources in new ways to achieve goals	4.58	4.88	-2.34*
2. Brainstorm (come up with) new ideas	4.88	5.02	-1.03
3. Think outside the box	4.79	4.97	-1.43
4. Identify opportunities for new ways to conduct activities	4.66	4.89	-1.82 [a]
5. Identify creative ways to get things done with limited resources	4.82	5.11	-2.30*
(2) Planning/management			
6. Manage time in projects	5.1	5.19	-0.72
7. Conduct analysis for a project that aims to solve a problem	5.01	5.25	-1.85 [a]
8. Set and achieve project goals	5.2	5.38	-1.50
9. Design an effective project plan to achieve goals	4.8	4.94	-1.13
(3) Marshalling resources			
10. Lead and manage a team	4.79	5.07	-1.92 [a]
11. Put together the right team in order to solve a specific problem	4.56	4.65	-0.65
12. Form partnerships in order to achieve goals	4.53	4.56	-0.18
13. Identify potential sources of resources	4.49	4.54	-0.40
14. Network (make contact and exchange information with others)	4.43	4.48	-0.34
15. Get others to identify with and believe in my visions and plans	4.52	4.50	0.19

4. The survey was also sent to the 28 individuals who could not be matched to Statistics Sweden's databases, which is why this sample is larger than the university course sample analyzed in Section 5.

16. Clearly and concisely explain verbally/in writing my ideas in everyday terms	5.17	5.05	0.93
17. Proactively take action and practically apply my knowledge	5.02	5.15	-1.10
(4) Managing ambiguity			
18. Improvise when I do not know what the right action might be	4.68	5.00	-2.34*
19. Tolerate unexpected change	4.86	4.95	-0.72
20. Persist in face of setbacks	4.95	5.05	-0.75
21. Learn from failure	5.59	5.76	-1.54
22. Manage uncertainty in projects and processes	4.38	4.52	-1.06
23. Exercise flexibility in complicated situations	4.76	4.80	-0.35
24. Work productively under continuous stress, pressure, and conflict	5.18	5.12	0.48
25. Make decisions in uncertain situations when outcomes are hard to predict	4.47	4.51	-0.27
(5) Financial knowledge			
26. Read and interpret financial statements	4.89	4.91	-0.10
27. Perform financial analysis	4.76	4.73	0.15
28. Control costs for projects	4.7	4.74	-0.25
29. Estimate a budget for a new project	4.49	4.59	-0.61
B. Entrepreneurial attitudes			
30. In general, starting a business is…Worthless (1) - Worthwhile (7)	5.05	5.18	-0.94
31. In general, starting a business is… Disappointing (1) - Rewarding (7)	5.37	5.52	-1.18
32. In general, starting a business is… Negative (1) - Positive (7)	5.6	5.62	-0.11
C. Entrepreneurial intentions			
33. I strongly consider setting up my own business	3.59	3.77	-0.90
34. I am willing to work hard to set up my own business	4.07	4.43	-1.78 [a]
35. I have been preparing to set up my own business	2.34	2.48	-0.74
36. I am going to try hard to set up my own company	3.23	3.40	-0.79
37. I would rather be employed than running my own company	4.67	4.44	1.29

Note: [a] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

We use the 29 self-efficacy questions to create scaled constructs for each of the five self-efficacy areas. Table 4 presents the scales, both aggregated for all the 434 students in our sample and separately for the control and participant groups. Cronbach's Alpha values are similar between the participant and control groups, indicating that they understood the questions similarly. The table also shows mean differences for participants and the control group. As can be seen, we note a weak difference between participants and non-participants only for the creativity construct ($p < 0.10$).

Table 4. The five constructs: Convergent construct validity and mean values

Construct	**Control group (n = 200)**		**Participant group (n = 236)**		**All (n = 436)**	
	Alpha	Mean	Alpha	Mean	t-test	Alpha
Creativity	0.84	4.77	0.83	4.96	-1.84 [a]	0.84
Planning	0.86	5.03	0.78	5.19	-1.50	0.83
Marshalling	0.88	4.7	0.86	4.74	-0.39	0.87
Ambiguity	0.90	4.87	0.86	4.96	-1.00	0.88
Financial literacy	0.93	4.7	0.93	4.75	-0.35	0.93

Note: ™ $p < 0.10$.

To represent program participation, we consider two different variables: (1) the dichotomous treatment variable denoting whether an individual had taken part in a course or not and (2) a "course length" variable, taking the value 0 for control group respondents, 1 if the individual attended a course worth 7.5 ECTS points (201 people, or 85% of responding participants), 2 for courses worth 15 ECTS points (26 people, or 11% of responding participants), and 4 for attending two 15 ECTS courses, in which case they received a total of 30 ECTS points (9 people, or 4% of responding participants).[5] Table 5 shows correlations between the two participation variables, the five efficacy constructs, and similar constructs regarding entrepreneurial intentions and entrepreneurial attitudes. We see that the dichotomous treatment variable (program participation) has a positive correlation with all constructs, but it is not statistically significant. The course length variable has a positive correlation with the creativity and intentions constructs.[6] Our survey results thus point to a weak but positive association between increased exposure to EET and entrepreneurial intentions as well as creativity-related self-efficacy, but since we were unable to conduct a survey before participation, we treat this evidence as correlational rather than causal. Seen in another light, this investigation suggests that self-selection into the program seems to be a minor issue: Of course, we do not observe intentions or self-efficacy prior to the start of the program, but it does seem that participants are practically indistinguishable from their fellow students in these respects just right after finishing the program. Hence while our main analysis cannot account for these psychological items, the pre-study results suggest that this is not a cause of great concern.

5. Participants at Borås University attended two courses worth 15 ECTS points each. Among all participants (responders and non-responders), 886 (81%) attended a course worth 7.5 ECTS points, 168 (15%) attended a course worth 15 ECTS points, whereas 38 (3.5%) attended a total of 30 ECTS points.
6. As an additional analysis, we modeled all variables in a multivariate (structural equation) framework to assess the simultaneous effect of our main treatment variable (program participation) on the self-reported psychometric constructs (searching/creativity, planning/ management, marshalling, managing ambiguity, financial knowledge) and intentions towards entrepreneurship among respondents. We find, however, that only the searching/creativity construct is correlated with intentions towards entrepreneurship, which in turn is correlated to program participation. These results remain correlational rather than causal.

Table 5. Correlation matrix (n=436)

Treatment		Course length	Creativity	Planning	Marshalling	Ambiguity	Financial	Attitudes
Course length	0.801*							
Creativity	0.088	0.144*						
Planning	0.072	0.036	0.514*					
Marshalling	0.019	0.037	0.669*	0.637*				
Ambiguity	0.048	0.083	0.595*	0.646*	0.719*			
Financial	0.017	-0.086	0.321*	0.535*	0.478*	0.433*		
Attitudes	0.033	0.065	0.355*	0.274*	0.399*	0.330*	0.249*	
Intentions	0.043	0.125*	0.374*	0.181*	0.356*	0.273*	0.192*	0.577*

Note: * $p < 0.05$.

5. Main Study: New Venture Creation and Income

The main study is based on Statistics Sweden's detailed individual-level LISA database,[7] comprising annually updated data on income, education, and demographics for all individuals age 16 years and over registered in Sweden. We identified all program participants, matched them to the database, and subsequently used students at the same university in the same age cohort with the same gender as the basis for constructing control groups (see below). To study the program under review in a reliable manner we have to address several challenges.

Notably, non-observable heterogeneity that may affect program selection comes in different forms depending on the type of program and the university, ranging from the choice to enlist in a years-long university education that includes an element of entrepreneurship, to the choice of attending a creativity workshop or business model contest. If the choices correlate with the outcome variables assessed, merely comparing outcomes between participants and non-participants would result in a biased estimation. We address the self-selection problem by pairing each participant with a "twin" with similar relevant characteristics using propensity score matching (PSM). Thus, we match individuals who took part in a program intervention to non-participants who presumably had the same probability of participating in the intervention. As a sampling frame for the control group, we use the full population of individuals born in 1970 or later who were registered at any of the Swedish universities participating in the program between 2011 and 2014 (n = 685,022). Together with the 1,891 participants in the program who could be matched to Statistics Sweden's databases, the total sample sums up to 686,913.

PSM relies on a set of assumptions that should hold for the method to be reliable. First, the common support assumption demands—in its strictest form—that there are some participants and some non-participants for each value that a

7. LISA is the acronym for "Longitudinell integrationsdatabas för sjukförsäkrings- och arbetsmarknadsstudier".

specific background variable takes (Rosenbaum and Rubin, 1983). Since we had access to such a large pool of potential recruits for the control group, this problem is negligible. Second, according to the conditional independence assumption, participants and individuals in the control group should be comparable—on average—after conditioning on observable variables (Caliendo and Kopeinig 2008). Fortunately, the register data contained several variables with demonstrated relevance for entrepreneurship, such as ethnicity and family background. In the analysis, we examine the validity of matching on such observables in the sense that mean values for the participant and the control groups are always comparable. While we were unable to observe factors like stable differences in psychological characteristics (Dehejia and Wahba 1999), the pre-study results suggest that such differences are minor. Furthermore, such non-observable heterogeneity should not bias our results as long as the error is random—namely, occurring with the same probability among participants and individuals in the control group. We return to a discussion of these assumptions below.

5.1. Data and Variables

Dependent variables: New venture creation and entrepreneurial income
Our first dependent variable is *new venture creation*, defined as being a founder-manager of a new independent venture (incorporation or sole proprietorship) in 2014 (after the program). The variable is measured based on tax records in LISA, presenting an individual's occupation and *primary source of income* at the end of each calendar year. This means we excluded part-time or small firms that could be run on the side to, e.g., supplement a main source of income or for taxation reasons (Folta et al. 2010). *Entrepreneurial income* is our second dependent variable, defined as the income from operating a business as a sole proprietorship or an incorporated firm (Frederiksen et al., 2016). We create this variable by taking the logarithm of the income of active business operations measured in hundreds of Swedish kronor (SEK) while exempting zeros from the logarithmic transformation (individuals who do not operate a business will have a reported entrepreneurial income of zero).

Independent variable: Intervention type
University-level programs in entrepreneurship tend to focus on multiple goals, such as facilitating entrepreneurial skills, teaching about academic theories, and preparing aspiring entrepreneurs for entrepreneurial careers (Gibb 1996). As a first step in the analysis and with our first hypothesis in mind, we assume that all interventions are equal to examine the overall impact of the program. In light of our overview of the program, this assumption stretches credibility. We then test whether effects differ between university courses and limited training

interventions. Thus, the first step in our analysis is based on a treatment variable equal to 1 if the student took part in any intervention and 0 otherwise. The second step splits the treatment variable to consider university course interventions and limited training interventions separately.

Independent variable: gender

As argued in Hypothesis 3, while studies have reported that men have higher entrepreneurial intentions and higher probability to engage in entrepreneurship than women (Chen et al. 1998), others show that women are more likely than men to judge that they need training before engaging in new venture creation (Gupta et al. 2008; 2014) and may be specifically open to input from role models in education and training (BarNir et al. 2011). In our study, gender is a dummy variable taking the value 1 for women.

Participant-specific control variables

We introduce a set of control variables that research has indicated affect both the likelihood of participating in EET and the potential impact of EET interventions. Many of these controls are good proxies for underlying attributes shown to be important for selection into entrepreneurship, such as human capital, parental background, age, and innate skills. Individuals whose parents have been involved in entrepreneurial endeavors may exhibit entrepreneurial intentions or have inherited entrepreneurship-specific human capital (Burke et al. 2000; Criaco et al. 2017; Lindquist et al. 2015). We include the dummy variables "mother entrepreneur" and "father entrepreneur", taking the value 1 if the focal person's parent ran a business at some point from 1986 onwards. Since parental education facilitates the formation of human capital in children we also control for "mother higher education" and "father higher education", each taking the value 1 if the parent had at least a three-year long college degree and 0 otherwise (Lindquist et al. 2015). "Non-Nordic background" takes the value 1 if the student was born outside the Scandinavian countries and 0 otherwise.

We use "high school grade" to account for the potential selection of students with high general ability into the program: the correlation between such grades and general ability (IQ) may be as high as 0.7 (Kanazawa 2006). This variable thus proxies for individuals' cognitive capabilities, crucial for their ability to accumulate human capital assets and transform experiences into entrepreneurial knowledge (Martin et al. 2013; Unger et al. 2011). To guard against grade inflation we divide students in each graduation cohort into grade percentiles. Finally, we use dummy variables denoting students' field of study and control for their age (Minola et al. 2014).

Table 6. Descriptive statistics for participants and the overall population

	Population	**Participants**	**t-value**
Gender (female)	0.59	0.66	-6.05**
Age (2011)	23.32	22.69	18.34**
Non-Nordic background	0.15	0.07	9.81**
Mother entrepreneur	0.14	0.14	-0.19
Father entrepreneur	0.26	0.28	-1.94 [a]
Mother higher education	0.27	0.25	1.64
Father higher education	0.22	0.20	1.84 [a]
High school grade	50.18	50.42	-0.34
Observations	685,022	1,891	

Note: N = 686,913. Participants and individuals in the control group born in 1970 or later who were enrolled at a university at some point between 2011 and 2014. Missing data for the variable high school grade means that the t-test was calculated on 1,678 participants and 496,025 control group individuals. Note: [a] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 6 shows descriptive statistics for the participant group and the overall population of students, revealing significant differences in several background variables. Program participants are more often women, generally younger, and less often of a non-Nordic background. By contrast, they have similar high school grades and parental background as other students; only for the variable father entrepreneur is there a small statistically significant difference between the two groups. However, this difference may be relevant since, as mentioned, research has shown that parental background in entrepreneurship is one of the strongest predictors of whether an individual will engage in entrepreneurship (Lindquist et al. 2015).

5.2. Analysis

Table 7 shows rates of entrepreneurship for all participants, for participants in university course interventions only, and for the general population. We report entrepreneurship statistics for these groups both in 2010 (the year before the program began) and in 2014. Since these statistics cover a population of young individuals (most are in their mid to late 20s) who are, at the most, only beginning their working career, their comparatively low rates of entrepreneurship was to be expected (Delmar and Davidsson 2000). For 2010, the difference in likelihood of being engaged in entrepreneurship full time between participants and the overall population is not statistically significant. Furthermore, participants in university course interventions stand out as roughly half as likely to be engaged in entrepreneurship as the rest of the population. While their level of entrepreneurship increased somewhat in 2014, it is still substantially lower than in the overall population.

Table 7. Rates of entrepreneurship 2010 and 2014 for participants and the control group

	Non-participants (control group)	**All participants**	**t-value**	**University course participants**	**t-value**
Entrepreneurs in 2010	0.015	0.016	-0.24	0.009	1.81 [a]
Observations	661,348	1,871		1,058	
Entrepreneurs in 2014	0.023	0.026	-0.72	0.011	2.54*
Observations	669,444	1,881		1,060	

Note: N (2010) = 663,219, N (2014) = 671,325. Note: [a] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. The t-value for participants in university course interventions is computed against all non-participants and participants in other interventions.

The first step in PSM is to estimate a propensity score, which, in this case, is the probability that an individual received a (particular) program intervention. We model this as a logit regression including program participation as the dependent variable and the independent variables presented in Table 6. Table 8 shows the results for selection equations with respect to new venture creation and entrepreneurial income.[8] In the first estimation, the dependent variable takes the value 1 if an individual participated in any program intervention between 2011 and 2014 (Column I); in the second estimation, the dependent variable takes the value 1 if an individual participated in any university course between 2011 and 2014 (Column II); and lastly, the dependent variable takes the value 1 if an individual participated in any limited training intervention between 2011 and 2014 (Column III).

Table 8. Propensity score estimation: Logit model for the probability of program participation

	New venture creation						**Entrepreneurial income**					
	(I)All interventions		**(II) University courses**		**(III) Limited interventions**		**(I) All interventions**		**(II) University courses**		**(III) Limited interventions**	
	Coef.	**Std. Err**	**Coef.**	**Std. Err**	**Coef.**	**Std. Err**	**Coef.**	**Std. Err**	**Coef.**	**Std. Err**	**Coef.**	**Std. Err**
Mother entrepreneur	-0.06	0.08	-0.02	0.10	-0.12	0.12	-0.07	0.07	-0.06	0.09	-0.08	0.11
Father entrepreneur	0.05	0.06	0.03	0.08	0.07	0.09	0.011	0.06	-0.03	0.07	0.07	0.09
Higher education mother	-0.23**	0.06	-0.23**	0.08	-0.23*	0.10	-0.21**	0.06	-0.23**	0.08	-0.18[a]	0.09
Higher education father	-0.20**	0.07	-0.19*	0.09	-0.21[a]	0.11	-0.20**	0.06	-0.25**	0.08	-0.13	0.10
Age	-0.06**	0.01	-0.08**	0.01	-0.05**	0.01	-0.07**	0.01	-0.11**	0.01	-0.03**	0.01
Non-Nordic background	-0.23**	0.12	-0.25	0.16	-0.20	0.17	-0.27*	0.11	-0.32*	0.15	-0.20	0.16
Gender (female)	0.00	0.00	0.01**	0.00	-0.01**	0.00	0.28**	0.05	-0.07	0.06	0.86**	0.09

8. The sample for entrepreneurial income is somewhat larger in all models since this variable has wider coverage than the new venture creation variable (individuals may still report some entrepreneurial income even if they are not engaged in entrepreneurship as a primary labor market activity).

High school grade	0.29**	0.06	-0.02	0.07	0.74**	0.09	0.00	0.00	0.01**	0.00	-0.00**	0.00
Faculty unknown	-1.01	1.01		(omitted)	-0.81	1.01	-0.59	-0.71		(omitted)	-0.51	0.71
Humanities and theology	-0.77**	0.18	-1.55**	0.43	-0.48*	0.21	-0.57**	0.16	-1.39**	0.39	-0.32[a]	0.18
Law and social sciences	-0.66**	0.15	-1.13**	0.30	-0.42*	0.19	-0.67**	0.14	-1.14**	0.30	-0.52**	0.17
Arts	0.67*	0.26	0.15	0.59	0.82**	0.30	0.49[a]	0.25	0.11	0.59	0.55[a]	0.28
Medicine and odontology	-0.68	0.47		(omitted)	0.01	0.48	-0.51	0.38		(omitted)	-0.00	0.39
Physical sciences	-0.51*	0.22	-2.02**	0.75	-0.13	0.25	-0.33[a]	0.19	-1.84**	0.63	-0.20	0.21
Technology	-0.35	0.27	-1.06	0.75	0.00	0.29	-0.36	0.24	-0.45	0.55	-0.12	0.26
Health care	-1.68**	0.53	1.05	0.71	-2.17**	0.75	-1.31**	0.41	-0.95	0.71	-1.52**	0.49
Other faculty	0.80**	0.29	0.45	0.73	0.76*	0.33	0.77**	0.27	0.46	0.72	0.65*	0.30
Constant	-4.23**	0.19	-4.49**	0.27	-5.56**	0.27	-3.91**	0.18	-3.46**	0.26	-6.03**	0.25
Observations	551,910		527,714		551,079		563,169		538,276		562,152	
Likelihood ratio chi-2	583.94		433.79		228.81		682.56		614.30		229.13	
Prob > chi2	0.00		0.00		0.00		0.00		0.00		0.00	
Pseudo R2	0.029		0.035		0.024		0.029		0.042		0.021	

Notes: High school grade inflation adjusted across cohort. [a] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

As Table 8 reveals, the estimations are fairly similar regarding which variables affect selection. Age and parents with a higher education affect the probability of participating in the program negatively in virtually all estimations. The effects of high school grades and gender are more ambiguous, whereas parental entrepreneurial history seems to have little effect whatsoever. Pseudo R2 is low in all estimations, but it is considered a poor measurement for assessing the efficiency of PSM in creating groups that are balanced over covariates (Ho et al. 2007). A more relevant heuristic is that no significant difference remains on included variables between participants and the control group identified by the propensity score. T-tests subsequent to matching demonstrate that this is the case: the bias is generally small and never significant, supporting the conditional independence assumption (Caliendo and Kopeinig, 2008). Also, as mentioned, the control group sampling frame consisted of more than 600,000 individuals. All estimations fulfill the common support assumption.

In a second step, we match participants according to the nearest-neighbor principle using individuals who did not participate but had a similar likelihood of participating according to their estimated propensity score.[9] The approach enables a reasonable comparison when considering the outcome variables—new venture creation and income. In Table 9a, we compare the outcome for all participants with the general population and with the control group matched on the propensity score from the estimation in Column I of Table 8. New venture

9. When an observation has several nearest neighbors, a chance algorithm determines which neighbor to include in the control group. Results using alternative matching techniques (kernel, radius, and local linear regression) were very similar.

creation rates amount to 1.6 percent for the participation group and 1.8 percent for the matched control group, with overlapping confidence intervals. This first analysis leads us to reject Hypothesis 1a since it suggests that the program as a whole did not increase participants' likelihood of engaging in entrepreneurship, and Hypothesis 1b since entrepreneurial income for those that engage in entrepreneurship is not different between participants and the matched control group (individuals who do not operate a business will have a reported entrepreneurial income of zero).

Table 9a. Average treatment effect on the treated for all program interventions

Dependent variable: New venture creation 2010-2014

Population: 1,453 participants, 550,457 in the control group					
Comparison	Participants	Control group	Difference	S.E.	t-stat.
Unmatched (n = 551,910)	0.016	0.017	-0.001	0.003	-0.25
Matched (n = 2,906)	0.016	0.018	-0.002	0.005	-0.43

Dependent variable: Ln(entrepreneurial income) 2014

Population: 1,734 participants, 561,435 in the control group					
Comparison	Participants	Control group	Difference	S.E.	t-stat.
Unmatched (n = 563,169)	0.390	0.374	0.015	0.047	0.33
Matched (n = 3,468)	0.390	0.297	0.092	0.062	1.48

Table 9b. Average treatment effect on the treated for all university courses

Dependent variable: New venture creation 2010-2014

Population: 831 participants, 526,883 control group individuals					
Comparison	Participants	Control group	Difference	S.E.	t-stat.
Unmatched (n = 527,714)	0.008	0.017	-0.008 [a]	0.004	-1.84
Matched (n = 1,662)	0.008	0.022	-0.013*	0.006	-2.22

Dependent variable: Ln(entrepreneurial income) 2014

Population: 1,017 participants, 537,259 in the control group					
Comparison	Participants	Control group	Difference	S.E.	t-stat.
Unmatched (n = 538,276)	0.260	0.367	-0.107 [a]	0.061	-1.77
Matched (n = 2,034)	0.260	0.275	-0.015	0.071	-0.21

Table 9c. Average treatment effect on the treated for all limited training interventions

Dependent variable: New venture creation 2010-2014

Population: 622 participants, 550,457 in the control group					
Comparison	Participants	Control group	Difference	S.E.	t-stat.
Unmatched (n = 551,079)	0.026	0.017	0.009 [a]	0.005	1.76
Matched (n=1,244)	0.026	0.014	0.011	0.008	1.41

Dependent variable: Ln(entrepreneurial income) 2014

Population: 717 participants, 561,435 in the control group					
Comparison	Participants	Control group	Difference	S.E.	t-stat.
Unmatched (n = 562,152)	0.574	0.374	0.200**	0.073	2.74
Matched (n = 1,434)	0.574	0.315	0.259*	0.110	2.36

Notes: [a] $p < 0.10$, [*] $p < 0.05$, [**] $p < 0.01$. For new venture creation, 438 treated cases (23% of the pre-match sample) were dropped due to lack of coverage on this variable. For entrepreneurial income, the corresponding number was 157 cases (8% of the pre-match sample).

In Table 9b, we consider university course interventions as the treatment, identifying the matched control group by the propensity scores from Column II of Table 8. Participants in these interventions were substantially less likely to enter entrepreneurship between 2010 and 2014 than the general population, in line with the descriptives in Table 7. New venture creation rates amount to 0.8 percent for participants in the university course interventions and 2.2 percent for the matched control group. The results thus suggest that, if anything, interventions taking the form of university courses had a negative effect on program participants' new business creation. As for entrepreneurial income, differences between participants and the matched control group are minuscule for those that engage in entrepreneurship. In Table 9c, only limited training interventions are considered treatment, with the matched control group identified by the propensity scores from Column III of Table 8. While participants have a considerably greater probability of starting a firm than non-participants (2.6 percent compared to 1.4 percent), the difference is not statistically significant, meaning we cannot confirm hypothesis 2a. However, the bottom rows of Table 9c show that participants have a 30 percent higher ($100 * (\exp(0.259)\ 1) = 29.563$) entrepreneurial income ($p < 0.05$), supporting hypothesis 2b. While these results only offer limited support for an increased likelihood of entering entrepreneurship by starting a new independent venture, they do show that limited training interventions increase the chances of a higher entrepreneurial income.

Tables 10a–c examine the 1,248 female participants only. While results from all program interventions (Table 10a) show no significant difference between female participants and the matched control group of female non-participants in terms of starting a new venture, the picture is different for entrepreneurial income: compared to matched female non-participants, female participants have 20 percent higher ($100 * (\exp(0.182)\ 1) = 19.961$) entrepreneurial income ($p < 0.05$). This suggests that female participants have benefited more from the overall program than male participants.

Table 10a. Average treatment effect on the treated for program interventions

Dependent variable: New venture creation 2010-2014

Population: Women; 1,022 treated, 328,575 untreated					
Comparison	Treated	Control group	Difference	S.E.	t-stat.
Unmatched (n = 329,597)	0.018	0.012	0.005	0.003	1.50
Matched (n = 2,044)	0.018	0.013	0.005	0.006	0.86

Dependent variable: Ln(entrepreneurial income) 2014

Population: Women; 1,219 treated, 335,134 untreated					
Comparison	Treated	Control group	Difference	S.E.	t-stat.
Unmatched (n = 336,353)	0.409	0.318	0.091	0.056	1.64
Matched (n = 2,438)	0.409	0.226	0.182*	0.078	2.35

Table 10b. Average treatment effect on the treated for university courses

Dependent variable: New venture creation 2010-2014

Population: Women; 489 treated, 311,278 untreated					
Comparison	Treated	Control group	Difference	S.E.	t-stat.
Unmatched (n = 311,767)	0.006	0.012	-0.006	0.005	-1.24
Matched (n = 978)	0.006	0.016	-0.010	0.008	-1.36

Dependent variable: Ln(entrepreneurial income) 2014

Population: Women; 598 treated, 317,438 untreated					
Comparison	Treated	Control group	Difference	S.E.	t-stat.
Unmatched (n = 318,036)	0.152	0.298	-0.146 [a]	0.075	-1.96
Matched (n = 1,196)	0.152	0.236	-0.084	0.085	-0.98

Table 10c. Average treatment effect on the treated for limited training interventions

Dependent variable: New venture creation 2010-2014

Population: Women; 533 treated, 328,575 untreated					
Comparison	Treated	Control group	Difference	S.E.	t-stat.
Unmatched (n = 329,108)	0.028	0.012	0.016**	0.005	3.27
Matched (n = 1,066)	0.028	0.011	0.017 [a]	0.009	1.94

Dependent variable: Ln(entrepreneurial income) 2014

Population: Women; 614 treated, 335,127 untreated					
Comparison	Treated	Control group	Difference	S.E.	t-stat.
Unmatched (n = 335,741)	0.680	0.318	0.362**	0.079	4.55
Matched (n = 1,228)	0.680	0.258	0.422**	0.134	3.14

Notes: [a] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. For new venture creation, 226 treated cases (18% of the pre-match sample) were dropped due to lack of coverage on this variable. For entrepreneurial income, the corresponding number was 29 cases (2% of the pre-match sample).

When we only consider female participants in university courses (Table 10b), the coefficients for entry and income are insignificant. As in the main estimations (Table 9b), the coefficients are negative, indicating that if anything, female course participants started new firms to a lesser extent and saw less income from their firms than matched female non-participants. These results can be contrasted with the results for female participants in the limited training interventions. While female participants have a considerably greater probability of starting a firm than female non-participants (2.8 percent compared to 1.1 percent), this difference is only statistically significant at the 10 percent level ($t = 1.94$), so we cannot confirm Hypothesis 3a. Nevertheless, female participants in limited interventions have significantly higher entrepreneurial income than non-participants: on average, it is almost 53 percent higher ($100 * (\exp(0.422) \ 1) = 52.501$), compared to 30 percent for all participants in limited training interventions ($p < 0.01$). Taken together, the results from Tables 10b and 10c lend further support to Hypothesis 3b in that moderate EET participation increases female participants' entrepreneurial earnings more than for men. These results suggest that female participants were more responsive to the limited training interventions than male participants. This finding is interesting given our discussion on the importance of role models and good examples for women considering an entrepreneurial career.

5.3. Robustness Tests

To ensure the veracity of the results, we repeated the estimations for new venture creation while only including individuals who participated in the program in a specific year. Participants were not more likely to enter entrepreneurship compared to the matched control group in any of the annual estimations assessing the overall effect of the program.

We also consider two alternative dependent variables: (1) entrepreneurship in 2014, a dummy variable taking the value 1 if an individual is engaged in either full time or part-time entrepreneurship (as opposed to only full-time entrepreneurship as in the main regressions) in this year or 0 otherwise, and (2) change in employment status between 2010 and 2014, an ordinal variable taking the value 1 if an individual was not engaged in entrepreneurship in 2010 but was in 2014, 0 if an individual's employment status remained unchanged between 2010 and 2014, and -1 if an individual was engaged in entrepreneurship full time in 2010 but not in 2014. The results for these alternative outcome variables were qualitatively very similar.

6. Discussion

In this paper, we studied the effects of an EET program funded by the Swedish government that was administered as either longer interventions in the form of university courses or shorter interventions delivered without university course credits. We first undertook a pre-study based on a survey sent out to participants in university courses and a control group of similar students with questions relating to the proximal outcomes of entrepreneurial efficacy, entrepreneurial perceptions, and entrepreneurial intentions. Bivariate results provide some weak support for the notion that increased exposure to EET may enhance entrepreneurial intentions and self-efficacy in the area of creativity. In the main study, we matched 1,891 participants in a comprehensive Swedish EET program to a control group of more than 600,000 Swedish university students. We showed that while program participants were generally no more likely than comparable individuals to start a business, students who had taken part in limited training interventions were more likely than similar individuals to engage in entrepreneurship. However, perhaps the most striking result was the significantly higher income that entrepreneurs who had taken part in a limited training intervention generated, compared to the income of otherwise similar individuals. Furthermore, this positive effect of entrepreneurial income was enhanced when only women were considered. In contrast, those who had participated in longer university course interventions were less likely than the matched control group to engage in entrepreneurship. Our interpretation is that inspirational interventions with an emphasis on female lecturers and mentors may promote interest and confidence, especially for female participants who see gender stereotypes challenged. By contrast, the greater knowledge concerning the entrepreneurial process provided by the more extensive interventions may be discouraging. Taken together, our results suggest that shorter but more specific training may be more beneficial than longer courses when it comes to the long-term effects of entrepreneurship education.

6.1. Contributions to Research on Entrepreneurship Education

We provide two specific contributions to research on entrepreneurship education. First, we theorize on and test whether the effectiveness of EET interventions depends on the duration and structure of such interventions, following recent calls in the literature (Bae et al. 2014; Martin et al. 2013). Results suggest that EET is more effective when delivered as moderate rather than extensive interventions, creating knowledge through the transformation of experience rather than through theoretically oriented education in a classroom setting. This hints at an attenuating effect of specific human capital investment, a cornerstone of human capital theory, which, to the best of our knowledge has not been integrated with

the literature on entrepreneurship education before. In the uncertain domains of entrepreneurship, less extensive EET may serve to foster participants' entrepreneurship more than extensive EET since extensive education may discourage students by making them aware of their learning gaps.

Second, we theorize on and examine whether the gender normative stereotypes prevalent in entrepreneurial discourses can be overcome by specific interventions. While some studies attend to gender differences in general EET programs, there has been scant attention to how interventions specifically designed for women may moderate such gender differences. Our results suggest that the negative effects of gender stereotypes associated with entrepreneurship can be moderated by exposing EET participants to female role models (Ahl 2004; Carter and Rosa 1998; Foss et al. 2019). Finally, our study highlights the importance of investigating long-term outcomes of EET interventions rather than the more commonly used proximal outcomes.

Our study has implications for policymakers and educators. First, we show that there is no 'one size fits all' in entrepreneurship education. Short-term effects such as higher entrepreneurial intentions and self-efficacy may differ from long-term effects such as new venture creation and entrepreneurial performance. The study highlights that more extensive entrepreneurship education need not be more effective. Shorter practice-based interventions focusing on providing entrepreneurial role models and facilitating knowledge through practical exercises may be more beneficial than longer, theory-oriented EET in a classroom setting. The finding that shorter interventions with a focus on role models may be especially beneficial for female students provides seeds of thought for policymakers and educators seeking to address the gender gap in entrepreneurship through educational efforts.

6.2. Limitations and Future Research

Our study comes with limitations, several of which constitute interesting avenues for future research. First, while the register data used to test our hypotheses made it possible to measure new venture creation and entrepreneurial income before and after participation, our evidence regarding more proximal outcomes from EET in the pre-study (entrepreneurial self-efficacy, attitudes, and intentions) was limited to participants in the university course interventions after participation. We thus cannot draw definite conclusions regarding proximal outcomes of the EET interventions studied. Future studies could handle this problem by convincing organizers of EET interventions to collect psychometric data both before and after interventions to enhance our understanding of how EET efforts are related to intermediate and long-term outcomes (Moberg, 2014; DeTienne and Chandler, 2004).

A second limitation is the relatively short time that has passed since the interventions ended—between one and three years—and the time at which outcome measures were observed. The timing affected the potential to study outcomes concerning realized entrepreneurial behavior. It is well-known that most entrepreneurs, especially successful ones, start their firms after being active in an industry for some time, and the probability of starting a firm is highest among individuals in their 30s and 40s. Peer effects between students in more or less entrepreneurial universities and classes could also affect students' likelihood for future entrepreneurial activity (Falck et al. 2012). The long-term effects of these programs are therefore challenging to examine so soon after individuals' EET participation, but this is a problem shared by many EET studies (Fairlie et al. 2015). When more time has passed, updated data will enable additional examinations of the effect of the program under survey here.

A third limitation is that our distinction between moderate and extensive EET interventions was inferred from the program design rather than explicitly designed by the researchers, such as in an experiment. Future research could provide more detailed inference regarding the attenuating effect of human capital investments (i.e., when more learning is beneficial or not) as well as the effects of exposure to female role models (i.e., how much role models matter and how) based on research-designed interventions manipulating such factors in both lab and field studies.

References:

Ahl, H. (2004), *The Scientific Reproduction of Gender Inequality: A Discourse Analysis of Research Texts on Women's Entrepreneurship*, Malmö, Sweden: Liber.

Aldrich, H.E. and Yang, T. (2012), "Lost in translation: Cultural codes are not blueprints", *Strategic Entrepreneurship Journal* 6(1): p 1-17.

Alsos, G.A. and Kolvereid, L. (1998), "The business gestation process of novice, serial, and parallel business founders", *Entrepreneurship: Theory and Practice*, 22(4): p 101-102.

Astebro, T. and Hoos, F. (2016), "The effects of a training program to encourage social entrepreneurship: Field-experimental evidence", HEC Paris Research Paper No. SPE-2016-1128.

Athayde, R. and Hart, M. (2012), "Developing a methodology to evaluate enterprise education programmes", *International Review of Entrepreneurship*, 10(3): p 91-114.

Bae, T.J., Qian, S., Miao, C. and Fiet, J.O. (2014), "The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review", *Entrepreneurship Theory and Practice* 38(2): p 217-254.

BarNir, A., Watson, W.E. and Hutchins, H.M. (2011), "Mediation and moderated mediation in the relationship among role models, self-efficacy, entrepreneurial career intention, and gender", *Journal of Applied Social Psychology* 41(2): p 270-297.

Becker, G.S. (1964), *Human Capital*, New York: Columbia University Press.

Becker, G.S. (1993), "Nobel lecture: The economic way of looking at behavior", *Journal of Political Economy* 101: p 385-409.?

Bellu, R.R. (1993), "Task role motivation and attributional style as predictors of entrepreneurial performance: Female sample findings", *Entrepreneurship & Regional Development* 5(4): p 331-334.

Bögenhold, D. and Klinglmair, A. (2015), "Female solo self-employment-features of gendered entrepreneurship", *International Review of Entrepreneurship*, 13(1): p 47-58.

Bosma, N., van Praag, M., Thurik, R. and de Wit, G. (2004), "The value of human and social capital investments for the business performance of start-ups", *Small Business Economics* 23(3): p 227-236.

Burke, A.E., Fitzroy, F.R., and Nolan, M.A. (2000), "When less is more: Distinguishing between entrepreneurial choice and performance", *Oxford Bulletin of Economics and Statistics*, 62(5): p 565-587.

Caliendo, M. and Kopeinig, S. (2008), "Some practical guidance for the implementation of propensity score matching", *Journal of Economic Surveys* 22(1): p 31-72.

Carter, S. and Rosa, P. (1998), "Indigenous rural firms: Enterprises in the UK", *International Small Business Journal* 16(4): p 15-27.

Chen, C.C., Greene, P.G. and Crick, A. (1998), "Does entrepreneurial self-efficacy distinguish entrepreneurs from managers?", *Journal of Business Venturing* 13(4): p 295-316.

Cooper, A.C., Gimeno-Gascon, F.J. and Woo, C.Y. (1994), "Initial human and financial capital as predictors of new venture performance", *Journal of Business Venturing* 9(5): p 371-395.

Criaco, G., Sieger, P., Wennberg, K., Chirico, F. and Minola, T. (2017) "Parents' performance in entrepreneurship as a 'double-edged sword' for the intergenerational transmission of entrepreneurship", *Small Business Economics* 49(4): p 841-864.

Debrulle, J., Maes, J. and Sels, L. (2012), "Identifying the entrepreneur in entrepreneurship: An overview of the research field with special emphasis on human and social capital", *Review of Business and Economic Literature* 57(4): p 258-282.

Dehejia, R.H. and Wahba, S. (1999), "Causal effects in nonexperimental studies: Reevaluating the evaluation of training programs", *Journal of the American Statistical Association* 94: p 1053-1062.

Delmar, F. and Davidsson, P. (2000), "Where do they come from? Prevalence and characteristics of nascent entrepreneurs", *Entrepreneurship and Regional Development* 12(1): p 1-23.

DeTienne, D.R. and Chandler, G.N. (2004), "Opportunity identification and its role in the entrepreneurial classroom: A pedagogical approach and empirical test", *Academy of Management Learning and Education* 3(3): p 242-257.

DeTienne, D.R. and Chandler, G.N. (2007), "The role of gender in opportunity identification", *Entrepreneurship Theory and Practice* 31(3): p 365-386.

Du Rietz, A. and Henrekson, M. (2000), "Testing the female underperformance hypothesis", *Small Business Economics* 14(1): p 1-10.

Eesley, C. and Wang, Y. (2017), "Social influence in career choice: Evidence from a randomized field experiment on entrepreneurial mentorship", *Research Policy* 46(3): p 636-650.

Elert, N., Andersson, F. and Wennberg, K. (2015), "The impact of entrepreneurship education in high school on long-term entrepreneurial performance", *Journal of Economic Behavior and Organization* 111: p 209-223.

Epple, D., Argote, L., and Devadas, R. (1991), "Organizational learning curves: A method for investigating intra-plant transfer of knowledge acquired through learning by doing", *Organization Science* 2(1): p 58-70.

Fairlie, R.W., Karlan, D. and Zinman, J. (2015), "Behind the GATE experiment: Evidence on effects of and rationales for subsidized entrepreneurship training", *American Economic Journal: Economic Policy* 7(2): p 125-161.

Falck, O., Heblich, S. and Luedemann, E. (2012), "Identity and entrepreneurship: Do school peers shape entrepreneurial intentions?", *Small Business Economics* 39(1): p 39-59.

Fayolle, A. (2013), "Personal views on the future of entrepreneurship education", *Entrepreneurship & Regional Development* 25(7-8): p 692-701.

Fayolle, A. and Liñán, F. (2014), "The future of research on entrepreneurial intentions", *Journal of Business Research* 67(5): p 663-666.

Fayolle, A., Gailly, B. and Lassas-Clerc, N. (2006), "Assessing the impact of entrepreneurship education programmes: A new methodology", *Journal of European Industrial Training* 30(9): p 701-720.

Fayolle, A., Verzat, C. and Wapshott, R. (2016), "In quest of legitimacy: The theoretical and methodological foundations of entrepreneurship education research", *International Small Business Journal* 34(7): p 895-904.

Folta, T.B., Delmar, F. and Wennberg, K. (2010), "Hybrid entrepreneurship", *Management Science* 56(2): p 253-269.

Foss, L., Henry, C., Ahl, H. and Mikalsen, G.H. (2019), "Women's entrepreneurship policy research: A 30-year review of the evidence", *Small Business Economics* 53(2): p 409-429.

Frazis, H. and Loewenstein, M.A. (2005), "Reexamining the returns to training functional form, magnitude, and interpretation", *Journal of Human Resources* 40(2): p 453-476.

Frederiksen, L., Wennberg, K. and Balachandran, C. (2016), "Mobility and entrepreneurship: Evaluating the scope of knowledge-based theories of entrepreneurship", *Entrepreneurship Theory and Practice* 40(2): p 359-380.

Gibb, A.A. (1996), "Entrepreneurship and small business management: Can we afford to neglect them in the twenty-first Century business school?", *British Journal of Management* 7(4): p 309-321.

Gupta, V.K., Turban, D. and Bhawe, N.M. (2008), "The effect of gender stereotype assimilation and reactance on entrepreneurial intentions", *Journal of Applied Psychology* 93: p 1053-1061.

Gupta V.K., Turban, D., Wasti, S. and Sikdar, A. (2009), "The role of gender stereotypes in perceptions of entrepreneurs and intentions to become an entrepreneur", *Entrepreneurship Theory and Practice* 33(2): p 397-417.

Gupta, V., Goktan, A., and Gunay, G. (2014), "Gender differences in evaluation of new business opportunity: A stereotype threat perspective", *Journal of Business Venturing* 29: p 273-288.

Hahn, D., Minola, T., Van Gils, A. and Huybrechts, J. (2017), "Entrepreneurial learning at universities: Exploring multilevel contingencies", *Entrepreneurship and Regional Development* 29(9-10): p 945-974.

Henry, C., Foss, L., and Ahl, H. (2016), "Gender and entrepreneurship research: A review of methodological approaches", *International Small Business Journal* 34(3): p 217-241.

Hindle, K. (2007), "Teaching entrepreneurship at University: From the wrong building to the right philosophy", In: Fayolle, A. (ed.), *Handbook of Research in Entrepreneurship Education*. Cheltenham, UK: Edward Elgar, pp. 104-126.?

Ho, D.E., Imai, K., King, G., and Stuart, E.A. (2007), "Matching as nonparametric preprocessing for reducing model dependence in parametric causal inference", *Political Analysis* 15(3): p 199-236.

Hsu, D.H. (2007), "Experienced entrepreneurial founders, organizational capital, and venture capital funding", *Research Policy* 36: p 722-741.

Jayawarna, D., Jones, O., and Macpherson, A. (2014), "Entrepreneurial potential: The role of human and cultural capitals", *International Small Business Journal*, 32(8), 918-943.

Johannisson, B. (1991), "University training for entrepreneurship: Swedish approaches", *Entrepreneurship & Regional Development* 3(1): p 67-82.

Kanazawa, S. (2006), "IQ and the wealth of states", *Intelligence* 34(6): p 593-600.

Kim, P.H., Aldrich, H.E. and Keister, L.A. (2006), "Access (not) denied: The impact of financial, human, and cultural capital on entrepreneurial entry in the United States", *Small Business Economics* 27(1): p 5-22.

Kirby, D.A. (2004), "Entrepreneurship education: Can business schools meet the challenge?", *Education + Training* 46: p 510-519.

Klyver, K., Nielsen, S. and Evald, M. (2013), "Women's self-employment: An act of institutional (dis)integration? A multilevel, cross-country study", *Journal of Business Venturing* 28(4): p 474-488.

Krueger, N.F., Reilly, M.D. and Carsrud, A.L. (2000), "Competing models of entrepreneurial intentions", *Journal of Business Venturing* 15(5-6): p 411-432.

Levie, J., Kelley, D.J., Martínez, A.C. and Schøtt, T. (2014), "The effect of training in starting a business on subsequent entrepreneurial awareness, attitudes, intention and activity: A 37 nation study", *International Review of Entrepreneurship*, 12(3): p 79-102.

Lindquist, M., Sol, J. and Van Praag, M. (2015), "Why do entrepreneurial parents have entrepreneurial children?", *Journal of Labor Economics* 33(2): p 269-296.

Loi, M., Castriotta, M. and Guardo, M. (2016), "The theoretical foundations of entrepreneurship education: How co-citations are shaping the field", *International Small Business Journal*, 34(7): p 948-971.

Malmström, M., Johansson, J. and Wincent, J. (2017), "Gender stereotypes and venture support decisions: How governmental venture capitalists socially construct entrepreneurs' potential", *Entrepreneurship Theory & Practice*, 41(5): p 833-860.

Marlow, S. (1997), "Self-employed women-New opportunities, old challenges?", *Entrepreneurship & Regional Development* 9(3): p 199-210.

Marlow, S. and Martinez Dy, A. (2018), "Annual review article: Is it time to rethink the gender agenda in entrepreneurship research?", *International Small Business Journal* 36(1): p 3-22.

Martin, B., McNally, J. and Kay, M. (2013), "Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes", *Journal of Business Venturing* 28(2): p 211-224.

Matlay, H., Rae, D. and Wing Yan Man, T. (2012), "Developing a behaviour-centred model of entrepreneurial learning", *Journal of Small Business and Enterprise Development* 19: p 549-566.

McGee, J., Peterson, M., Mueller, S. and Sequeira, J. (2009), "Entrepreneurial self-efficacy: Refining the measure", *Entrepreneurship Theory and Practice* 33(4): p 965-988.

Menzies, T. and Paradi, J. (2003), "Entrepreneurship education and engineering students - Career path and business performance", *International Journal of Entrepreneurship and Innovation* 4(2): p 121-132.

Ministry of Enterprise and Innovation (2007), "Regeringsbeslut N2007/4596/ENT: Program för att främja kvinnors företagande", Stockholm: Näringsdepartementet.

Minola, T., Criaco, G. and Cassia, L. (2014), "Are youth really different? New beliefs for old practices in entrepreneurship", I*nternational Journal of Entrepreneurship and Innovation Management* 18(2-3): p 233-259.

Moberg, S.K. (2013), "An entrepreneurial self-efficacy scale with a neutral wording", In: A. Fayolle, P. Kyrö, T. Mets, and U. Venesaar (Eds.), *Conceptual Richness and Methodological Diversity in Entrepreneurship Research: Entrepreneurship Research in Europe* (pp. 67-94). Cheltenham, UK: Edward Elgar.

Moberg, K. (2014), *Assessing the Impact of Entrepreneurship Education: From ABC to PhD*. Doctoral Thesis, Copenhagen Business School.

Morris, M.H., Kuratko, D.F., Schindehutte, M. and Spivack, A.J. (2012), "Framing the entrepreneurial experience", *Entrepreneurship Theory and Practice* 36(1): p 11-40.

Mustar, P. (2009), "Technology management education: Innovation and entrepreneurship at MINES ParisTech, a leading French engineering school", *Academy of Management Learning and Education* 8(3): p 418-425.

Nabi, G., Liñán, F., Fayolle, A., Krueger, N., and Walmsley, A. (2017), "The impact of entrepreneurship in higher education: A systematic review and research agenda", *Academy of Management Learning & Education*, 16(2): p 277-299.

Oosterbeek, H., Van Praag, M. and IJsselstein, A. (2010), "The impact of entrepreneurship education on entrepreneurship skills and motivation", *European Economic Review* 54(3): p 442-454.

Pittaway, L. and Cope, J. (2007), "Simulating entrepreneurial learning integrating experiential and collaborative approaches to learning", *Management Learning* 38(2): p 211-233.

Psacharopoulos, G. (2006), "The value of investment in education: Theory, evidence, and policy", *Journal of Education Finance* 32(3): p 113-136.

Rae, D. (2010), "Universities and enterprise education: Responding to the challenges of the new era", *Journal of Small Business and Enterprise Development* 17: p 591-606.?

Rauch, A., and Hulsink, W. (2015), "Putting entrepreneurship education where the intention to act lies: An investigation into the impact of entrepreneurship education on entrepreneurial behavior", *Academy of Management Learning and Education* 14(2): p 187-204.

Robson, P.J., Akuetteh, C.K., Westhead, P. and Wright, M. (2012), "Exporting intensity, human capital and business ownership experience", *International Small Business Journal* 30(4): p 367-387.

Rosenbaum, P. and Rubin, D. (1983), "The central role of the propensity score in observational studies for causal effects", *Biometrika* 70(1): p 41-55.

Rosendahl Huber, L., Sloof, R. and Van Praag, C.M. (2014), "The effect of early entrepreneurship education: Evidence from a field experiment", *European Economic Review* 72(11): p 76-97.

SAERG (2015a), "Slutrapport. Främja kvinnors företagande 2011-2014. Golden Rules of Leadership 2013-2014", Stockholm: Tillväxtverket / Swedish Agency for Economic and Regional Growth (SAERG).

SAERG (2015b), "Främja kvinnors företagande 2007-2014 - Resultat och lärdomar i korthet", Stockholm: Swedish Agency for Economic and Regional Growth (SAERG).

Shaw, E., Marlow, S., Lam, W., and Carter, S. (2009), "Gender and entrepreneurial capital: Implications for firm performance", *International Journal of Gender and Entrepreneurship* 1(1): p 25-41.

Souitaris, V., Zerbinati, S. and Al-Laham, A. (2007), "Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources", *Journal of Business Venturing* 22(4): p 566-591.

Thrane, C., Blenker, P., Korsgaard, S. and Neergaard, H. (2016), "The promise of entrepreneurship education: Reconceptualizing the individual-opportunity nexus as a conceptual framework for entrepreneurship education", *International Small Business Journal* 34(7): p 905-924.

Ucbasaran, D., Westhead, P. and Wright, M. (2008), "Opportunity identification and pursuit: Does an entrepreneur's human capital matter?", *Small Business Economics* 30(2): p 153-173.

Unger, J., Rauch, A., Frese, M. and Rosenbusch, N. (2011), "Human capital and entrepreneurial success: A meta-analytical review", *Journal of Business Venturing* 26(3): p 341-358.

Van Gelderen, M., Kautonen, T., Wincent, J. and Biniari, M. (2018), "Implementation intentions in the entrepreneurial process: Concept, empirical findings, and research agenda", *Small Business Economics* 51(4): p 923-941.

Von Graevenitz, G., Harhof, D. and Weber, R. (2010), "The effects of entrepreneurship education", *Journal of Economic Behavior and Organization* 76(1): p 90-112.

Westhead, P. and Solesvik, M.Z. (2016), "Entrepreneurship education and entrepreneurial intention: Do female students benefit?", *International Small Business Journal* 34(8): p 979-1003.

Wilson, F., Kickul, J. and Marlino, D. (2007), "Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: Implications for entrepreneurship education", *Entrepreneurship Theory and Practice* 31(3): p 387-406.

Appendix

Table A1. All projects in the program Entrepreneurship in Higher Education

University	Project name	Awarded amount (SEK)	Evaluated
Halmstad University	SISTERS 2—Support and inspiration for girls in entrepreneurship	772,548	Yes
University of Borås	Women's entrepreneurship in textile and fashion	1,050,000	Yes
Malmö University	Entrepreneurship in service innovation and service business	709,894	Yes
Södertörns University	Entré Q Flemingsberg: creativity, innovation, and business development	690,000	No**
Mid Sweden University	MIUN Innovation—For entrepreneurship in education	681,689	Yes
University of Gothenburg	Entrepreneurship in health care education at Sahlgrenska Akademin	639,996	Yes
Upgrades Education Sweden AB	Entrepreneurship theory	616,359	No**
Municipality of Varberg	EMBRYO: Entrepreneurship and business development	519,714	Yes
University of Borås	Facilitating entrepreneurship knowledge among university teachers	516,863	No*
University of Skövde	Care entrepreneurs	501,232	No**
Linnæus University	Entrepreneurial women at Linnæus University	497,199	Yes
SLU Holding AB	Trampolin Generation 2—Entrepreneurial developmental program for students at SLU[a]	446,271	Yes
Lund University	Believe in your ideas	419,797	Yes
University of Borås	Entrepreneurship in textile and fashion	300,000	Yes
Swedish University of Agricultural Sciences (SLU)	Lian: Women's entrepreneurship in green sectors	227,840	No*

Notes: * The project consisted of activities targeted at teachers. ** Participants' social security numbers could not be retrieved. [a] SLU= Swedish University of Agricultural Sciences. Source: SAERG (2015b).