



Mitigating the lack of prior entrepreneurial experience and exposure through entrepreneurship education programs

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Mitigating the lack of prior entrepreneurial experience and exposure through entrepreneurship education programs

Prior
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Abstract

Purpose – To increase the understanding of how entrepreneurship education impacts entrepreneurial careers, the purpose of the paper is to investigate the role that a venture creation program (VCP) might have in mitigating or surpassing a lack of other antecedents of entrepreneurial careers. In particular, the authors focus on entrepreneurial pedigree and prior entrepreneurial experience.

Design/methodology/approach – Data from graduates of VCPs at three universities in Northern Europe were collected through an online survey. Questions addressed graduate background prior to education, yearly occupational employment subsequent to graduation and graduates' own perceptions of entrepreneurial activity in employment positions. The survey was sent to 1,326 graduates and received 692 responses (52.2% response rate).

Findings – The type of VCP, either independent (Ind-VCP) or corporate venture creation (Corp-VCP), influenced the mitigation of prior entrepreneurial experience. Prior entrepreneurial experience, together with Ind-VCP, made a career as self-employed more likely. However, this was not the case for Corp-VCP in subsequently choosing intrapreneurial careers. Entrepreneurial pedigree had no significant effect on career choice other than for hybrid careers.

Research limitations/implications – Entrepreneurial experience gained from VCPs seems to influence graduates toward future entrepreneurial careers. Evidence supports the conclusion that many VCP graduates

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This research is a part of the Entrepreneurship Program Alumni Study (EPAS), collaboration between Sten K Jonsson Centre for Entrepreneurship at Lund university, Sweden, Chalmers School of Entrepreneurship at Chalmers University of Technology, Sweden and Engage/NTNU School of Entrepreneurship at the Norwegian University of Science and Technology (NTNU), Norway. Data collection from NTNU graduates was supported by Engage – Centre for Engaged Education through entrepreneurship, Norway. Data collection from Lund University graduates was supported by The Entrepreneurship Foundation in Lund, Sweden. Martin Stockhaus gratefully acknowledges funding from the Hans E Olsson Foundation and The Family of Knut and Ragnvi Jacobsson Foundation.



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who lack prior entrepreneurial experience or entrepreneurial pedigree can develop sufficient entrepreneurial competencies through the program.

Originality/value – This study offers novel evidence that entrepreneurship education can compensate for a lack of prior entrepreneurial experience and exposure for students preparing for entrepreneurial careers.

Keywords Entrepreneurial career, Entrepreneurial experience, Entrepreneurial pedigree, Venture creation program

Paper type Research paper

Introduction

Entrepreneurship education has over the last four decades risen in importance for societal renewal (Hägg and Kurczewska, 2022). A reoccurring argument from policy has been that entrepreneurial education is needed to create a more innovative and entrepreneurially oriented workforce (e.g. Ball, 1989; European Commission, 2013), that could lead to a “productive contribution in society” from multiple viewpoints, including how to contribute to more sustainable development (Jones, 2010, p. 510). Initiatives in higher education include promoting and developing entrepreneurial competencies (Bird, 2019; Henry and Chatzichristou, 2014) contributing to such a workforce. Future employees are seen to require a palette of competencies that go beyond the traditional corridor thinking associated with stable corporate careers (Chatzichristou and Henry, 2014; Heslin *et al.*, 2020), as current career trajectories do not progress in a linear fashion compared with the past (Arthur, 2014). Additionally, with the increasing recognition that entrepreneurs are made and not born (Garavan and O’Cinneide, 1994; Katz, 2007; Carrier, 2005), the reliance on nature being the selection mechanism for who might become entrepreneurial is problematic given the start-up activities seen through studies such as the Global Entrepreneurship Monitor (Bosma *et al.*, 2012). Instead, there is a continued call for equipping university graduates with competencies fostering entrepreneurial engagement regardless of the career pursued (Alsos *et al.*, 2023; McGrath and MacMillan, 2000; Daniel, 2016; Jones *et al.*, 2017). A continuing argument for how to educate entrepreneurial graduates is through an experience-based approach, including an interplay between action and reflection (Jones-Evans *et al.*, 2000; Hägg and Kurczewska, 2016; Williams-Middleton and Donnellon, 2017), where one comprehensive approach has been addressed as a venture creation program (VCP) (Lackéus and Williams-Middleton, 2015) to develop entrepreneurial competencies (Alsos *et al.*, 2023).

A VCP utilizes the entrepreneurial process as the main learning vessel to develop knowledge about entrepreneurship, as well as skills regarding how to perform entrepreneurial activities and abilities for when and why to make decisions in situations characterized by uncertainty (e.g. Lackéus and Williams-Middleton, 2015; Williams-Middleton, 2013; Hägg, 2017; Haneberg and Aadland, 2019). Despite the general push for promoting entrepreneurship education with a foundation in the venture creation process, Kuratko and Morris (2018) reminds us that the majority of graduates enter into employment, implying also a need for intrapreneurial competencies. Thus, in conjunction with societal trends and the corporate need of entrepreneurial employees, the development of corporate entrepreneurship education has gained traction (Lackéus *et al.*, 2020). An argument has been that providing entrepreneurial experiences during curricular education can aid in preparing graduates for their future entrepreneurial careers, whether it is toward start-ups and thus independent ventures or intrapreneurship and corporate ventures. Given the importance of entrepreneurial tasks being carried out in an already established business, corporate venturing versions of VCPs (Corp-VCPs) exist as master-level programs alongside VCPs focusing on independent start-ups (Ind-VCPs) (see e.g. Winborg and Hägg, 2022). The main difference between the two versions is the context in which the entrepreneurial learning activities are being performed: a start-up setting (Ind-VCP) or an established organization setting (Corp-VCP).

Regarding graduates of entrepreneurship education in general, factors such as entrepreneurial pedigree and prior entrepreneurial experience have at times been positioned as more influential than curricular education (Carr and Sequeira, 2007; Fayolle and Gailly, 2015). Carr and Sequeira (2007) argue that entrepreneurial pedigree in the form of relatives undertaking entrepreneurial activity has an impact on the choice of becoming an entrepreneur. Research has also suggested that being socially embedded in an entrepreneurial family, where lived experience of being an entrepreneur is passed on through strong social ties (a form of vicarious learning), contributes to entrepreneurial experience (Shi *et al.*, 2015; Arregle *et al.*, 2015), potentially affecting an entrepreneurial career choice. With such emphasis on informal, socialized learning through family embeddedness (see Zhao *et al.*, 2021) or own practice, what about individuals without prior entrepreneurial experience or exposure through entrepreneurial families? If entrepreneurship education could mitigate for the lack of prior entrepreneurial experience or entrepreneurial pedigree, then it would have important societal implications.

The VCP form of entrepreneurship education, utilizing the creation of a venture as the main learning vessel, allows students to gain real-life experiences. This gaining of entrepreneurial experience through education could be argued to mitigate a shortage of prior entrepreneurial exposure and/or experience. Based on the above reasoning and the need to understand how entrepreneurship education impacts entrepreneurial careers, the purpose of the paper is to investigate the role that a VCP might have on mitigating or surpassing a lack of other antecedents of entrepreneurial careers. In particular, we focus on entrepreneurial pedigree and prior entrepreneurial experience. Thus, this study asks, “What role do types of VCPs play in the subsequent career choice of graduates?” The study contributes to the growing yet limited research stream that seeks to connect educational processes with post-graduation careers (e.g. Alsos *et al.*, 2023; Matlay, 2008) and provides a brick for closing the intention-to-behavior gap (Nabi *et al.*, 2017). Although an important area to study, there are limitations to using cross-sectional survey data and the findings in this paper should be viewed in the light of this. The methodological limitations are further addressed in the method section and are important when interpreting the findings of this emerging area of research.

The paper is structured as follows. First, the review of existing literature results in three stated hypotheses. Next, the empirical grounding of the paper is presented, building from survey data of graduates from three VCPs at three universities in Northern Europe. Findings act as the basis for discussion regarding current contributions experience-based entrepreneurship programs to entrepreneurship (education) theory, practice and policy. The paper ends with a conclusion and a discussion around the limitation of the study and avenues for future research.

Literature review

Entrepreneurship education

Entrepreneurship, as well as entrepreneurship education, has for a long time been associated with the term action (Kirzner, 1997; von Mises, 1949; Sarasvathy, 2008), where scholars have found that entrepreneurs learn experientially from the actions undertaken (Cope, 2005; Politis, 2005). The importance of learning from action, as seen in practicing entrepreneurs, has influenced entrepreneurship education design, with one main assumption being that to learn entrepreneurship, one needs to engage in entrepreneurial activity (Hägg and Gabrielsson, 2019). Recent developments in entrepreneurship education include a range of action-based forms, where the most extreme learning format, practicing entrepreneurship, has been tied to VCPs that situate students in real-life venture creation as the main learning vessel (Lackéus and Williams-Middleton, 2015). Some VCPs focus on independent venture creation (Ind-VCP),

while others focus on corporate entrepreneurship or venturing processes within established organizations (Corp-VCPs) (Winborg and Hägg, 2022). Other than the venturing process being internalized within an organizational structure (rather than independent), Corp-VCPs share many similarities when it comes to the pedagogical approach as Ind-VCPs. Both types of VCPs aim to contribute to early career socialization into specific organizational environments, in which the student learns to navigate (Alvesson and Sandberg, 2014), but with individual level differences between the two types. Whilst Ind-VCP students learn to navigate the social and cultural dispositions of a start-up ecosystems (Lackéus and Williams Middleton, 2015), Corp-VCP students learn to navigate the intraorganizational politics and structures of innovative projects within established environments (Winborg and Hägg, 2022). Hence, despite underlying similarities when it comes to learning from and through entrepreneurial experience, there are subject-related differences that impacts what knowledge the students acquire, how it is acquired (in existing or emergent organizations) and for what reasons certain processes are highlighted. Kuratko and Morris (2018) argue that being able to perform an entrepreneurial health audit provides knowledge and skills to understand the internal environment of a corporation and their level of entrepreneurialism, which is highly specific for a Corp-VCP and would not provide much input when educating toward Ind-VCP given the contextual differences. Given the above, the authors acknowledge that there are individual level differences between the two types of VCPs but also that there is an underlying similarity in the approach to learning. However, to date, there is limited understanding of the extent to which high levels of experiential action-based learning, as found in both types of VCPs, might mitigate other antecedents of entrepreneurial careers, such as entrepreneurial pedigree or prior entrepreneurial experience.

From entrepreneurial intention to behavior in entrepreneurial careers

As the importance of entrepreneurship education continues to grow across the world (Morris and Liguori, 2016; Zaring *et al.*, 2016), the use of intentions to measure the effect of entrepreneurship education (Bae *et al.*, 2014) has become less relevant in comparison to other measures (Nabi *et al.*, 2017). There is less emphasis on producing intentions (given that the intent to enroll on a course or program has already been acted upon) (Van Gelderen *et al.*, 2015) and more on the development of knowledge, skills and abilities to make judgments (Biesta, 2009). Hence, education provides a foundation for expanding or changing individuals' behavior based on continuously expanded competencies (Hager and Gonczi, 1996; Alexander *et al.*, 1991). Nevertheless, intentions and the measurement of entrepreneurial intent following educational intervention have received considerable attention by scholars to provide insight on the effects of the educational intervention, despite there being little agreement among scholars (Martin *et al.*, 2013; Rauch and Hulsink, 2015; Walter and Block, 2016). Some scholars have argued for a move toward longer-term impact measures, like graduates' behavior (Nabi *et al.*, 2017), as such focus could lead to more profound changes in students, as well as the discussions on action-regulation, training and its impact on entrepreneurial behavior (e.g. Gielnik *et al.*, 2015; Gielnik *et al.*, 2016). Investigating behavior is seen as more appropriate when addressing post-graduation careers compared to intentions, as intentions do not portray or inform what graduates are doing. Investigating the graduates' careers, whether as employed, starting their own venture, or both in combination (hybrid entrepreneurship, see Alsos *et al.*, 2023), would give insights into the outcome of entrepreneurship education. Hence, a shift toward behavior research is seen as important due to its explanatory value of graduate careers.

Entrepreneurial careers

This paper positions entrepreneurial careers as an important outcome from entrepreneurship education. Careers are argued as a more appropriate evaluation for effects of

entrepreneurship education compared to the prevalent measure of entrepreneurial intention, i.e. the perceived desirability and feasibility of acting entrepreneurially (Liñán *et al.*, 2011). Antecedents to entrepreneurial careers other than entrepreneurship education, are discussed, namely prior entrepreneurial experience and an entrepreneurial pedigree. Entrepreneurial pedigree is understood as an individual having been born, brought into, or grown-up in a family in which one or more members are actively engaged in entrepreneurship.

Antecedents of entrepreneurial careers

Prior entrepreneurial experience is suggested to be favorable for the entrepreneur, both in terms of opportunity recognition (Shane, 2000) in early stages, but also throughout the entrepreneurial endeavor where an individual's accumulated entrepreneurial knowledge (Corbett, 2005; Politis, 2005) can provide significant benefit (Dyer, 1995). Studies have explored if prior entrepreneurial experience, including various factors such as industry knowledge or network insights, influence the performance or success of the new venture (e.g. Cooper *et al.*, 1994; Jo and Lee, 1996; West and Noel, 2009). In their study, Cooper *et al.* (1994) find that previous industry experience influences a firm's growth and survival rates. For example, West and Noel (2009) found having a chief executive officer (CEO) with experience from a related business would positively influence the new venture's performance. However, it is not previous industry or start-up experience alone that influence the entrepreneurial activities and performance, as the entrepreneur's educational level and type is shown to influence the process (Åstebro *et al.*, 2012; Jo and Lee, 1996). In addition, talent is found to influence the venturing process when operating in less familiar conditions (Eesley and Roberts, 2012). Prior entrepreneurial experiences therefore have the possibility to influence new venture performance, though in different ways and with varying results.

In terms of opportunity recognition, evaluation and discovery, research seems to find a positive relationship to an individual's former entrepreneurial activities. Davidsson and Honig (2003) found that prior entrepreneurial experience positively influenced whether an individual would engage in entrepreneurial activities. One possible explanation suggested is the effect of increased tacit knowledge developed from prior entrepreneurial experience; a resource which might be utilized in the process of identifying more novel and innovative opportunities (Shepherd and DeTienne, 2005; Smith *et al.*, 2009). Another possible explanation could be that prior entrepreneurial experience is applied when evaluating different aspects of an opportunity (Gruber *et al.*, 2015), for instance knowing which information sources should be investigated (Cassar, 2014). Farmer *et al.* (2011) find that having prior entrepreneurial experience will positively moderate the relationship between entrepreneurial identity and the exploiting behavior of the entrepreneur. As such, having a possible "entrepreneurial-self" or belonging to an entrepreneurial group/community, will positively influence the individual's entrepreneurial behavior (Farmer *et al.*, 2011). It can therefore be expected that individuals with prior entrepreneurial experience will utilize their knowledge and skills in identifying and evaluating new opportunities. In addition, more experience likely increases the quantity of identified and evaluated opportunities, which could give the individual several options for potential new entrepreneurial activities.

Entrepreneurial pedigree

For the most part, research regarding individuals coming from families with members who have engaged in entrepreneurial activity has been explored through studies into family entrepreneurship. In such studies, entrepreneurship is most often considered specifically in terms of starting and running a business. Early studies in this area argued that the majority of entrepreneurial firms were run by families (Dyer and Handler, 1994) and also spoke to the

different priorities in family-run entrepreneurial firms compared to corporations, such as trust and communication, as well as processes for succession.

Individuals with entrepreneurial pedigree have been found more likely to engage in entrepreneurial activity (Hamilton, 2011). The younger generations embedded in entrepreneurial families are seen to be strongly influenced by previous generations – particularly parents – through socialized learning and role modeling (Steyaert and Katz, 2004). Parents shape behavioral norms around entrepreneurial activity and impart specific knowledge and mindset connected to the family venture (Dou *et al.*, 2021). Additional aspects of parental influence include gender identity, giving different preferences to entrepreneurial activity depending upon which parent is self-employed and the motivation behind that self-employment (Feldmann *et al.*, 2020; Barrett, 2014). Veljkovic *et al.* (2019) investigated the career preferences of students with entrepreneurial parents vs non-entrepreneurial parents, finding those with entrepreneurial parents are influenced by parents' characteristics and behavior toward entrepreneurial activity.

Looking at entrepreneurial pedigree in relation to entrepreneurial careers, studies have addressed various ways in which families influence the individual's current and future entrepreneurial activity. Dyer and Handler (1994) highlight particular career nexus points in terms of (1) early experiences in the entrepreneur's family of origin; (2) family involvement in the entrepreneur's start-up activities; (3) employment of family members in the entrepreneurial firm; and (4) the involvement of family members in ownership and management succession. In studying the intentionality of an entrepreneurial career of individuals from the medical field, Zhao *et al.* (2021) illustrate that parental influence mediated personal attitude and behavior contributing to entrepreneurial intention. In addition, their study highlights the influence of the social and economic status of the parents, as well as the sector in which parents are employed. And while it has been argued that entrepreneurs and intrapreneurs are driven by the same entrepreneurial spirit (Hisrich, 1990), there is limited understanding of the potential impact of entrepreneurial pedigree on other types of entrepreneurial careers, such as intrapreneurship. Entrepreneurial pedigree may also have a counter effect, such that individuals are put off to becoming entrepreneurs. For example, in studying students' career-choice intentions, Zellweger *et al.* (2011) found that students with entrepreneurial pedigree believed they could become entrepreneurs, but did not want to be "in control" as entrepreneurs.

Hypothesis development

There is limited research investigating entrepreneurial careers subsequent to completed entrepreneurship education beyond individual narratives. Instead, antecedents, such as prior entrepreneurial experience and entrepreneurial pedigree, have been used to explain why individuals may be inclined toward more entrepreneurial careers. To reduce the gap between practice and theory, VCPs (Ind-VCPs and Corp-VCPs) provide an educational frame where students gain opportunities to experience entrepreneurship in real-life situations. Real-life venture creation or project work in established organizations is the vessel for learning, thus situating the learning in experience, combined with intense visceral learning from a network of peers, coaches and teachers in the program. Being situated in a real and career equivalent context also contributes to an early career socialization and orientation in specific organizational environments. This study's first hypothesis focuses on the importance of VCPs for making an entrepreneurial career choice. Differentiating between Ind-VCP and Corp-VCP experiences allows us to test VCP importance related to subsequent careers as self-employed (relatable to Ind-VCP) or intrapreneurs (relatable to Corp-VCP).

- H1. The type of entrepreneurship program (Ind-VCP or Corp-VCP) will be positively related to the type of occupation (self-employed or intrapreneur, respectively).

Prior entrepreneurial experience has been shown to impact on future entrepreneurial activity (Morris *et al.*, 2012; Ucbasaran *et al.*, 2003; Davidsson and Honig, 2003). Prior venturing experience has also been identified as an influence on new venture performance (Parker, 2013). Students entering a VCP should therefore benefit from prior entrepreneurial experience when initiating new entrepreneurial efforts in the program, affecting also the choice to have an entrepreneurial career after the program, leading us to the following hypothesis:

H2. Graduates from a VCP, who have entrepreneurial experience prior to the education, will to a higher extent have entrepreneurial careers after graduating (as self-employed, intrapreneurs or hybrids).

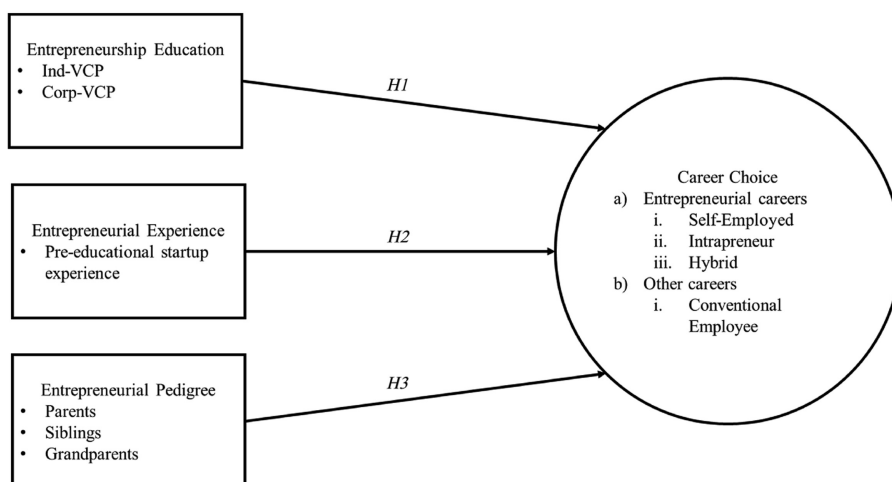
Individuals with family members (particularly parents) running firms are said to be more likely to engage in entrepreneurial activity (Hamilton, 2011). Students with entrepreneurial parents have been found to be more influenced toward entrepreneurial activities than those having non-entrepreneurial parents (Veljkovic *et al.*, 2019). Students entering a VCP with an entrepreneurial pedigree should therefore benefit from the visceral learning provided through family-based embeddedness in entrepreneurial activity when initiating new entrepreneurial efforts in the program and therefor more actively choosing an entrepreneurial career after graduation, leading to the following hypothesis:

H3. Graduates from a VCP, with family members who have entrepreneurial experience (pedigree), will to a higher extent have entrepreneurial careers after graduating (as self-employed, intrapreneurs, or hybrids).

The hypotheses are summarized in Figure 1, indicating the positive influence of educational type, prior experience and pedigree on graduates' early career choices.

Method

This paper investigates the role VCP education plays in subsequent career choice relative to the role prior entrepreneurial experience and entrepreneurial pedigree (exposure) has on entrepreneurial careers. This research interest implies a focus on a limited population:



Source(s): Author's own creation/work

Figure 1. Hypotheses model

graduates of VCPs. Intergroup comparisons within this population allows us to determine when a variable (type of VCP, prior experience and pedigree) significantly affect career choice. Given the relatively small sample size, testing interdependencies of variables was not considered and the analysis was based on the main effects of the independent variables, as indicated in [Figure 1](#).

Entrepreneurial career is considered from a broad perspective, across three occupational forms: self-employed, entrepreneurial employment (intrapreneur), hybrid (self-employed and employed in parallel), with conventional employment as an alternative occupational form. Following the examples of previous studies (e.g. [Hägg et al., 2023](#); [Turro et al., 2020](#)), binary logistic regression is used, in which entrepreneurial pedigree, prior entrepreneurial experience and VCP education, are used as regressors for separate subsamples of the occupational forms. In the following section the data collection, measures and sample description of the underlying study is presented.

Data collection and study context

The context of the study comprises VCPs at three Northern European universities. Two of the VCPs are in Sweden: Chalmers School of Entrepreneurship (Chalmers University of Technology) and Sten K. Johnson Center for Entrepreneurship (Lund University). The third is in Norway: NTNU School of Entrepreneurship (Norwegian University of Science and Technology). These programs provide students experience in entrepreneurship in a learning through approach. The process of creating new ventures is the vessel for learning entrepreneurship, where students take responsibility, supported by various stakeholders, in exploring new business, verifying value propositions, securitizing positions, forming and working in teams, gaining customer interest and buy-in, acquiring resources, application of entrepreneurial methods and decision making, among other things. The process integrated in the curricular design, where action is taken and reflected upon in iterative cycles allowing students to learn through experiences. Learning is assessed mainly through written deliverables and reflective assignments, including delivery of master's thesis work, assessed through opposition and examination by supervisors. Thus, the programs are combinations of curricular activity, including courses, assignments, lecturing, group work, etc. together with the venturing activities, where students are assessed as achieving designed learning objectives, resulting in a master's degree upon graduation (EQF/RQF level 7). The VCPs at Chalmers and NTNU span two years and are situated at departments of technology management, while the VCP in Lund University is one year long and in the context of a Business School. This situational context results in that Chalmers and NTNU VCPs constitute a majority of engineering students and Lund University VCPs constitute mainly of business students. But over time, the spectrum of student educational backgrounds at all three programs has increased. The international profile of the VCPs at the three universities varies. In Lund, the VCP has a majority of international students, coming from Europe, North America and Asia. The distribution of international to Swedish students has remained relatively stable since the start of the program with roughly 80% international students (where approximately 60% coming from within the European Union). For the first ten years (1997–2007) of the program at Chalmers, the student cohorts were only Swedish. The program became international in 2007, and since that point has on average had approximately 20% international students, mainly from Europe, Asia and also North America and South America. At NTNU, the program is more homogenous, as the student cohorts are Norwegian, with a few exceptions from Scandinavia, as the program is lectured in Norwegian. Despite these differences, there are several arguments for strong similarities between the VCPs in addition to the core similarity of the VCP educational design; the most important being the common geographical, social and cultural contexts. The three programs

apply the VCP design, with Chalmers and Lund University running both the Ind-VCP and the Corp-VCP [1]. NTNU offers only Ind-VCP.

A web-based survey was created targeting the graduate population from the VCPs at all three universities. The survey was sent out in the autumn of 2018 with data collection ending in November 2018. The survey was designed using prior alumni surveys from Massachusetts Institute of Technology (MIT), Ohio University, Higher Education Data Sharing Consortium (HEDS) Alumni survey and Cornell University, as well as based in academic literature addressing entrepreneurial competence development. Standardized questions addressed areas such as post-graduation career paths, demographics, as well as graduates' contact and engagement. Complementing questions included intrapreneurial activity as measured in the Global Entrepreneurship Monitor (GEM)-project (gemconsortium.org) and questions related to start-up behavior and nascent entrepreneurial activity (McGee *et al.*, 2009). Most important for this paper are the survey questions identified as connecting to prior entrepreneurial experience and entrepreneurial pedigree. The final survey was sent to 1,326 graduates from the total population of 1,568 graduates. The survey received 692 responses (52.2% response rate). The following section presents data collection and samples from each university.

Chalmers Graduates – Chalmers School of Entrepreneurship VCPs has had 837 graduates between 1997 and 2018. Contact information for 595 of the 837 graduates was obtained. The survey was distributed to this group in October 2018, followed by three reminders before closing the data collection in November 2018. In total, 316 valid responses (53% response rate) were received. *NTNU Graduates* – NTNU's VCP has had 259 graduates between 2003 and 2018. The survey was sent to the full population in September 2018, followed by four reminders before closing the data collection in November 2018. In total, 175 valid responses (67.6% response rate) were received. *Lund Graduates* – Lund University's VCPs has had 472 graduates between 2008 and 2018. The survey was sent out in October 2018 to the full population of graduates. It was followed by four reminders before closing the data collection in November 2018. In total, 201 valid responses (42.6% response rate) were received.

In terms of non-respondents, NTNU had no significant difference between respondents and non-respondents in terms of gender, age, educational background, but with a small difference in terms of graduation year. The situation was same for Lund, with more respondents in the program's last two graduation years, which also led to a difference in age. This difference could be explained with the program having a closer relationship with its recent graduates, compared to the ones that graduated longer ago. For Chalmers, there was also a small difference in graduation year, but not in the other variables.

Measures

Eesley and Lee (2021) state that the likelihood for founding a firm reaches a tipping point at five years after graduation (higher before than after the five-year mark). Following this, the focus was set on the individual's initial career choice after graduation from the VCP. To cover both relative closeness to the education and having a reasonably large sample, the four cohorts of 2014, 2015, 2016 and 2017 were chosen. The age distribution in this sample is quite homogenous with a vast majority taking the VCP after their bachelor studies in their mid-twenties. The cohort of 2018 was not included due to a concern of investigating career choice reflecting primary activity in close proximity (6-months) to graduation from the program. In the selected time span and until the end of the data collection period, a majority of respondents were still in their first career position (61.8%). However, the sample covers a range of zero to four transitions per individual, with a mean number of employments (excluding self-employment) of 1.37 and standard deviation of 0.961. The dependent variable used in the analysis is *occupational form*, defined as the main occupation in the latest six months before the data collection and considered to reflect the graduate's early choice of

career and subsequent career position. The variable was divided into four occupational forms: conventional employed, intrapreneur, self-employed and hybrid (combining self-employment and employment), of which the later three is considered entrepreneurial careers (see [Alsos et al., 2023](#)). The sample also contained non-occupationally active graduates ($n = 20$), where non-occupational includes engagement in studies, being in-between jobs, parental leave, being unemployed, or taking time off without actively searching for work. These individuals were excluded from analysis. To separate the employed category in conventional employed and intrapreneurs, two questions based on [Bosma et al. \(2012\)](#) was used: Q1 – idea development for a new business activity; and Q2 – preparation and implementation of a new business activity. A five-graded scale was used asking the employed graduates to what extent they are actively involved or have a leading role in undertaking intrapreneurial activities in their occupation, ranging from 1: main responsibility, 2: to a considerable degree, 3: to some extent, 4: only to a very little extent and 5: no engagement. To gauge the level of intrapreneurial activity in current employment, employed graduates that ticked 1 or 2 on one or both questions were categorized as intrapreneur. The final sample is presented in [Table 1](#), constituting 251 valid responses from the original uncropped and untreated sample.

The graduate cohorts are similar in size and composition, but with Lund skewed toward the 2017 cohort and Chalmers toward the 2016 cohort. The gender distribution in the sample (36.5% females) is slightly higher than the distribution in the population (28.5% females). But considering that an increasing percentage of admitted students are female, the sample is considered to be representative of the selected cohorts. The most populous of the occupational forms is the intrapreneurs followed by self-employed, conventional employee and hybrid. There are considerably more individuals identifying as intrapreneurs in relation to conventional employees in the sample; where criteria required identifying intrapreneurial activity as the main responsibility (1), or to a considerable degree (2). Chalmers and Lund have high quantity of individuals identifying as of intrapreneurs, which is not surprising as these

Variables	Total		Chalmers		NTNU		Lund	
	N	%	N	%	n	%	n	%
Female graduates	91	36.5	29	39.7	28	35.0	34	35.4
<i>Career choice</i>								
Intrapreneur	90	35.9	36	48.0	19	23.8	35	36.5
Conventional employee	56	22.3	18	24.0	22	27.5	16	16.7
Self-Employed	71	28.3	16	21.3	29	36.3	26	27.1
Hybrid entrepreneur	34	13.5	5	6.7	10	12.5	19	19.8
<i>Total</i>	<i>251</i>	<i>100</i>	<i>75</i>	<i>100</i>	<i>80</i>	<i>100</i>	<i>96</i>	<i>100</i>
<i>Entrepreneurship education</i>								
Ind-VCP	193	76.9	50	66.7	80	100	63	65.6
Corp-VCP	58	23.1	25	33.3	N/A	0	33	34.4
<i>Total</i>	<i>251</i>	<i>100</i>	<i>75</i>	<i>100</i>	<i>80</i>	<i>100</i>	<i>96</i>	<i>100</i>
<i>Graduate Cohorts</i>								
2014	54	21.5	15	20.0	22	27.5	17	17.7
2015	62	24.7	18	24.0	22	27.5	22	22.9
2016	71	28.3	29	38.7	20	25.0	22	22.9
2017	64	25.5	13	17.3	16	20.0	35	36.5
<i>Total</i>	<i>251</i>	<i>100</i>	<i>75</i>	<i>100</i>	<i>80</i>	<i>100</i>	<i>96</i>	<i>100</i>

Table 1. Frequency overview of research sample by university

Source(s): Authors' own creation/work

are the universities that include the Corp-VCP variant. Even though NTNU lacks the Corp-VCP, intrapreneurs make up a quarter of their sample, indicating that intrapreneurship is not solely a product of Corp-VCPs. When temporarily taking out the Corp-VCP from the sample (Lund and Chalmers data), the Ind-VCPs (from all three programs) generate similar quantity of self-employed and paid employment (intrapreneurs and conventional employees). This suggests that there is a fixed relationship at the population level as to whether graduates choose a career as self-employed or alternatively enter employment. Lund has more graduates choosing a hybrid career choice than NTNU and Chalmers graduates combined.

Independent variables in the form of entrepreneurial pedigree (Carr and Sequeira, 2007), experience (Hamidi *et al.*, 2008) and education (see further Lackeus and Williams Middleton, 2015; Winborg and Hägg, 2022) were included. A series of control questions were used that might have an implication on the dependent variables (family status and children), but also the independent variables (parents' educational level and entrepreneurial pedigree) (see Berglann *et al.*, 2011). Independent variables and control variables are summarized in Table 2 in the occupational form subsamples. From Table 2 it can be seen that men and women do not select the same early career choices. Women are twice as likely to choose employment (as an intrapreneur or conventional employee) in comparison to self-employment or hybrid employment. The three programs generate similar results, factored in that NTNU does not have a Corp-VCP. Educational level of graduate's parents is included in the analysis as an alternative form of pedigree (see Berglann *et al.*, 2011), this control variable is evenly distributed among the occupational forms. The pre-educational start-up experience is more

	Intrapreneur		Conventional employee		Self-employed		Hybrid entrepreneur	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
<i>Controls</i>								
Female (0/1)	0.44	0.500	0.50	0.505	0.24	0.430	0.21	0.410
Chalmers (0/1)	0.40	0.493	0.32	0.471	0.26	0.421	0.15	0.360
Lund (0/1)	0.39	0.490	0.26	0.456	0.37	0.485	0.56	0.504
NTNU (0/1)	0.21	0.410	0.39	0.493	0.41	0.495	0.29	0.463
Family status (Single = 0, Partner = 1)	0.67	0.471	0.63	0.487	0.62	0.490	0.77	0.425
Children (0 = No, 1 = Yes)	0.29	0.458	0.16	0.367	0.09	0.286	0.09	0.296
Parent 1 educ. level (1 = No university degree, 2 = Bachelor's, 3 = Master's, 4 = Doctoral)*	2.27	0.957	2.24	1.051	2.14	1.088	2.26	0.965
-Parent 2*	1.97	0.864	1.73	0.389	1.94	0.941	1.74	0.773
<i>Experiential learning</i>								
Pre-education start-up experience (0/1)	0.28	0.450	0.18	0.389	0.46	0.502	0.24	0.435
<i>Entrepreneurship education</i>								
Track (Ind-VCP = 0, Corp-VCP = 1)	0.38	0.488	0.23	0.426	0.07	0.258	0.18	0.387
<i>Entrepreneurship pedigree</i>								
Parents (0/1)	0.44	0.499	0.47	0.504	0.45	0.501	0.71	0.461
Siblings (0/1)	0.09	0.284	0.10	0.306	0.08	0.269	0.23	0.425
Grandparents (0/1)	0.21	0.412	0.20	0.407	0.23	0.425	0.29	0.461
No Pedigree (0/1)	0.16	0.371	0.12	0.331	0.09	0.292	0.06	0.250

Note(s): *Distinction between Parent 1 and 2 was made as Parent 1 being the most educated of the pair

Source(s): Authors' own creation/work

Table 2. Summary statistics by occupational status

likely in the self-employed subsample, where the other occupational forms are relatively consistent. Corp-VCP is more common for employed occupations and Ind-VCP is more common for self-employed and hybrid employment. Entrepreneurial pedigree is divided in four categories: parents, siblings, grandparents and no pedigree. Overall, it shows consistency between subsamples, with the noteworthy exception of hybrids having higher levels of pedigree compared to the other occupational forms.

Presented in [Table 3](#) is the intra-sample correlation matrix. Here it was observed that the gender variable correlates positively to conventional employment and negatively to self-employment and hybrid employment. There is also a negative correlation between females and having pre-educational start-up experience. Having pre-educational start-up experience correlates negatively to conventional employment and positively to self-employment. The differences regarding program compositions are evident in that Chalmers correlate positively to both intrapreneurs and the Corp-VCP track, NTNU have a negative correlation with intrapreneurs and also toward the Corp-VCP (due to the lack thereof) and Lund correlates positively to hybrid entrepreneurs. Another noteworthy correlation is that the graduates from Lund have parents' educational levels as a negative correlation, while the opposite is the case for the NTNU graduates. The family control variables show a positive correlation between intrapreneurs and having children, with the opposite case for self-employed. Family status doesn't correlate with career choice but shows a negative relation toward no pedigree. Focusing on the independent variables of the analysis, it can be noted that almost none of the variable's correlates. The exception being between no pedigree and having pre-education start-up experience. In the next section, the data is analyzed using binary logistic regression. SPSS version 25 was used to conduct the analysis.

Findings

The findings are structured in two steps. First, the entrepreneurial career choice is analyzed with conventional employee as the reference case in a binary logistic regression. In the second step, the self-employed, intrapreneur and hybrid occupational forms are analyzed independently as binary dependent variables in logistic regression. The independent variables are introduced in separate models to examine direct effect on model fit, regression coefficients and odds ratio: prior entrepreneurial experience as a first model, then prior entrepreneurial experience combined with VCP type (Ind- or Corp-) as a second model, entrepreneurial pedigree as a third model and a fourth model including prior entrepreneurial experience entrepreneurial pedigree and VCP type combined. [Tables 4–7](#) present the resulting regressor coefficient β for each independent variable and the standard error in the parenthesis and the corresponding odds ratio with confidence intervals (at the 95%-level).

In [Table 4](#), the occupational forms of self-employed, hybrid and intrapreneur are used as a combined measure of entrepreneurial career choice with conventional employment as reference case. Only the first model (prior entrepreneurial experience) has significant chi-square value and the only significant regressor is NTNU (as a university context). This was an expected outcome, given that NTNU does not have a Corp-VCP (which is significantly positive toward taking the intrapreneur path (as seen in [Table 6](#))). Given that the variables included in this study address entrepreneurial behavior and antecedents for an early career choice, it is anticipated that conventional employment models are the least aligned to the chosen regressors.

Next, the focus is set on the three occupational forms of entrepreneurial career choice. [Table 5](#) presents the self-employed occupational form, indicating that the regressors (independent variables) are contributing to the significance in the second, third and fourth models, but not the first model (entrepreneurial pedigree-only) in column three of [Table 4](#). Overall, choosing Ind-VCP rather than Corp-VCP and having prior entrepreneurial

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Intrapreneur (0/1)	1,000								
(2) Conventional Employee (0/1)	N/A	1,000							
(3) Self-Employed (0/1)	N/A	N/A	1,000						
(4) Hybrid Entrepreneur (0/1)	N/A	N/A	N/A	1,000					
(5) Female	0.119	0.150*	-0.165**	-0.132*	1,000				
(6) Chalmers	0.165**	0.026	-0.101	-0.131*	0.043	1,000			
(7) NTNU	-0.173**	0.085	0.121	-0.021	-0.022	N/A	1,000		
(8) Lund	0.010	-0.107	-0.021	0.144*	-0.019	N/A	N/A	1,000	
(9) Family Status	0.020	-0.033	-0.063	0.095	0.120	0.027	0.047	-0.068	1,000
(10) Children	0.226**	-0.027	-0.148*	-0.086	-0.051	-0.106	-0.026	0.117	0.057
(11) Parent 1 educational level	0.037	0.011	-0.061	0.017	0.043	0.033	0.165*	-0.185**	0.074
(12) Parent 2 educational level	0.086	-0.087	0.032	-0.057	0.038	0.027	0.143*	-0.159*	0.081
(13) Pre-education start-up experience	-0.043	-0.142*	0.217**	-0.052	-0.194**	0.009	-0.081	0.070	0.000
(14) Entrepreneurship education	0.260**	0.001	-0.239**	-0.051	0.103	0.138*	-0.375**	0.210**	0.051
(15) Parents	-0.070	-0.016	-0.049	0.180**	0.095	0.028	-0.131*	0.099	0.034
(16) Siblings	-0.046	-0.008	-0.061	0.154*	0.030	-0.102	0.072	0.022	0.095
(17) Grandparents	-0.025	-0.028	0.006	0.061	-0.003	-0.193**	0.152*	0.027	0.028
(18) No Pedigree	0.097	0.004	-0.054	-0.068	-0.050	-0.026	0.040	-0.014	-0.141*

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Intrapreneur (0/1)									
(2) Conventional Employee (0/1)									
(3) Self-Employed (0/1)									
(4) Hybrid Entrepreneur (0/1)									
(5) Female									
(6) Chalmers									
(7) NTNU									
(8) Lund									
(9) Family Status	1,000								
(10) Children	-0.0094	1,000							
(11) Parent 1 educational level	-0.070	0.619**	1,000						
(12) Parent 2 educational level	-0.061	-0.041	-0.113	1,000					
(13) Pre-education start-up experience	0.043	-0.069	-0.043	-0.111	1,000				
(14) Entrepreneurship education	0.051	-0.049	-0.042	0.012	0.000	10,000	1,000		
(15) Parents	-0.021	-0.026	-0.028	0.075	-0.075	0.040	0.019	1,000	
(16) Siblings	0.046	-0.030	-0.016	-0.025	0.003	0.070	0.019	0.022	1,000
(17) Grandparents	-0.037	-0.010	0.033	-0.133*	0.041	-0.358**	-0.128	-0.014	-0.200**
(18) No Pedigree									

Note(s): * = $p < 0.05$ and ** = $p < 0.01$
Source(s): Authors' own creation/work

Prior
entrepreneurial
experience

Table 3.
Intra-sample
correlation
matrix ($n = 251$)

Table 4.
Binary logistic
regression of
entrepreneurial career
choice

Model	(1)	(2)	(3)	(4)
Chi-Square	11,694*	11,858	13,452	12,081
Goodness-of-fit test	2,507	11,788	10,661	8,269
	β (S.E.)	β (S.E.)	β (S.E.)	β (S.E.)
<i>Controls</i>	<i>Exp(β) (C.I.)</i>	<i>Exp(β) (C.I.)</i>	<i>Exp(β) (C.I.)</i>	<i>Exp(β) (C.I.)</i>
Gender	-0.148 (0.358)	-0.161 (0.359)	-0.1 (0.359)	0.163 (0.442)
University:	-1.257*** (0.477)	-1.207** (0.492)	-1.148** (0.497)	-1.184* (0.632)
NTNU				
University:	-0.316 (0.498)	-0.336 (0.5)	-0.278 (0.508)	-0.398 (0.595)
Lund				
Family status	0.111 (0.362)	0.103 (0.362)	0.13 (0.367)	0.05 (0.461)
Children	0.515 (0.579)	0.508 (0.579)	0.522 (0.586)	1.057 (0.797)
Parent 1				
educational				
level				
Parent 2				
educational				
level				
<i>Experiential learning</i>				
Pre-education	-0.122 (0.374)	-0.122 (0.374)	0.003 (0.251)	0.039 (0.302)
start-up				
experience				
<i>Entrepreneurship education</i>				
Corp-VCP				
<i>Entrepreneurship pedigree</i>				
Parents				
Siblings				
Grandparents				
Note(s): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$				
Source(s): Authors' own creation/work				

Model	(1)	(2)	(3)	(4)
Chi-Square	28,879***	36,886***	24,712***	39,916***
Goodness-of-fit test	6,556	4,152	10,535	7,995
	β (S.E.)	β (S.E.)	β (S.E.)	β (S.E.)
<i>Controls</i>	<i>Exp(β) (C.I.)</i>	<i>Exp(β) (C.I.)</i>	<i>Exp(β) (C.I.)</i>	<i>Exp(β) (C.I.)</i>
Gender	-0.81** (0.354)	-0.761** (0.358)	-0.905** (0.354)	-0.81* (0.454)
University:	0.674 (0.427)	0.409 (0.436)	0.72 (0.443)	0.492 (0.575)
NTNU				1.636 (0.531-5.044)
University:	0.31 (0.419)	0.409 (0.43)	0.312 (0.423)	0.301 (0.527)
Lund				1.351 (0.481-3.792)
Family status	-0.24 (0.329)	-0.206 (0.334)	-0.151 (0.33)	-0.428 (0.429)
Children	0.786 (0.413-1.497)	0.814 (0.423-1.566)	0.86 (0.451-1.642)	0.652 (0.281-1.512)
Parent 1	0.198 (0.056-0.702)	0.21 (0.059-0.75)	0.19 (0.053-0.678)	0.085 (0.01-0.713)
Parent 2	-1.622** (0.647)	-1.559** (0.649)	-0.428** (0.218)	-0.684** (0.294)
educational level				0.504 (0.283-0.897)
Parent 2			0.37 (0.247)	1.886 (0.991-3.589)
educational level				
<i>Experiential learning</i>				
Pre-education	0.946*** (0.328)	0.831** (0.334)	0.831** (0.334)	0.704* (0.416)
start-up experience		2.295 (1.192-4.419)		2.022 (0.895-4.567)
<i>Entrepreneurship education</i>				
Corp.VCP		-1.473** (0.582)	0.229 (0.073-0.717)	-2.223*** (0.798)
<i>Entrepreneurship pedigree</i>				
Parents			0.049 (0.326)	0.963 (0.421-2.203)
Siblings			-0.851 (0.599)	-0.939 (0.651)
Grandparents			-0.182 (0.393)	0.039 (0.487)

Note(s): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$
Source(s): Authors' own creation/work

Table 5. Binary logistic regression of self-employed career choice

Table 6.
Binary logistic
regression of
intrapreneur career
choice

Model	(1)	(2)	(3)	(4)
Chi-Square	29,399*** 6,186 β (S.E.)	38,950*** 8,348 β (S.E.)	31,855*** 9,650 β (S.E.)	34,866*** 6,655 β (S.E.)
Goodness-of-fit test				
<i>Controls</i>				
Gender	0.649** (0.316) -1.076*** (0.4)	0.591* (0.323) -0.77* (0.415)	0.635** (0.323) -1.149*** (0.425)	0.654* (0.393) -0.514 (0.522)
University: NTNU		1.913 (1.03-3.555) 0.341 (0.156-0.746)	1.806 (0.958-3.405) 0.463 (0.205-1.045)	1.888 (1.003-3.554) 0.317 (0.138-0.729)
University: Lund		0.499 (0.243-1.026) 0.973 (0.518-1.829)	0.413 (0.193-0.882) 0.881 (0.462-1.679)	0.536 (0.251-1.142) 0.906 (0.474-1.733)
Family status		-0.027 (0.322) 1.651*** (0.426)	-0.127 (0.329) 1.707*** (0.436)	-0.369 (0.405) 2.072*** (0.544)
Children		5.21 (2.262-11.999)	5.512 (2.345-12.96)	7.944 (2.733-23.094)
Parent 1 educational level			0.005 (0.195)	0.011 (0.233)
Parent 2 educational level			0.303 (0.227)	0.255 (0.27)
<i>Experiential learning</i>			1.355 (0.868-2.113)	1.29 (0.76-2.19)
Pre-education start-up experience		-0.177 (0.335)	-0.048 (0.347)	0.346 (0.407)
<i>Entrepreneurship education</i>				
Corp-VCP			1.212*** (0.4)	1.312*** (0.465)
<i>Entrepreneurship pedigree</i>				
Parents			-0.562* (0.319)	-0.39 (0.377)
Siblings			-0.022 (0.529)	-0.509 (0.614)
Grandparents			0.117 (0.388)	-0.037 (0.461)
Note(s): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$				
Source(s): Authors' own creation/work				

Model	(1)	(2)	(3)	(4)
Chi-Square	21.607** 7.143	22.667*** 12.351	33.013*** 5.338	27.696* 6.389
Goodness-of-fit test	β (S.E.)	β (S.E.)	β (S.E.)	β (S.E.)
<i>Controls</i>				
Gender	-1.235** (0.5)	-1.176** (0.502)	-1.377** (0.533)	-1.313** (0.567)
University: NTNU	0.757 (0.706)	2.131 (0.535-8.496)	0.617 (0.715)	0.252 (0.089-0.717)
University: Lund	1.587** (0.661)	4.888 (1.338-17.852)	0.729 (0.757)	2.072 (0.47-9.136)
Family status	0.92* (0.479)	2.509 (0.98-6.022)	1.443** (0.68)	1.312* (0.702)
Children	-1.444* (0.783)	-1.415* (0.785)	0.865* (0.496)	0.558 (0.547)
Parent 1 educational level		0.236 (0.051-1.096)	-1.433 (0.788)	-1.292 (0.821)
Parent 2 educational level			0.286 (0.267)	0.24 (0.291)
<i>Experiential learning</i>			-0.306 (0.324)	-0.251 (0.352)
Pre-education start-up experience	-0.644 (0.469)	0.525 (0.21-1.315)	0.482 (0.188-1.233)	0.416 (0.469)
<i>Entrepreneurship education</i>				
Corp-VCP		-0.587 (0.586)	0.556 (0.176-1.755)	-0.863 (0.547)
<i>Entrepreneurship pedigree</i>				
Parents			1.169** (0.464)	1.302** (0.512)
Siblings			1.068* (0.585)	1.143* (0.61)
Grandparents			0.21 (0.509)	0.037 (0.562)

Note(s): * $p < 0.1$, ** $p < 0.05$ and *** $p < 0.01$

Source(s): Authors' own creation/work

Prior entrepreneurial experience

Table 7. Binary logistic regression of hybrid career choice

experience, is shown to have significant influence on selecting self-employment as a career choice. The fourth model (combined) in column four of Table 4, suggests that self-employed graduates also have the variable “educational level of parents” as significant contribution toward early career choice. Revisiting Table 2, a paired samples *t*-test was used to compare the relative differences in educational level between the parental pairs. All four occupational forms had significant differences between parents at the $p < 0.05$ level. The initial interpretation of a low relative difference in “educational level of parents” influencing self-employment may be of less importance due to the tested mean difference. “Number of children” is seen as a control variable carrying significant value and odds ratio, as self-employed graduates overall have fewer children compared to the other occupations forms (see Table 2).

The models for intrapreneur (Table 6) show that the Corp-VCP is a significant regressor. When Corp-VCP is not included in the models, the gender variable (which is correlated positively to Corp-VCP) is significant, as well as NTNU’s Ind-VCP program. Entrepreneurial pedigree as sole regressor generates weak models compared to the effect of VCP type. Intrapreneurs seem to have children to a greater extent than their self-employed and hybrid peers (see Table 5 and Table 7). One interpretation of these findings could be that stability of income and being able to provide for one’s family guides career choice in the early career in contrast to graduates not having children. The intrapreneur career choice combines the securities of conventional employment, with the opportunity to apply entrepreneurial competencies to a greater extent.

The hybrid occupational form is analyzed in Table 7. Hybrid seems to be the only occupational form affected by entrepreneurial pedigree (from parents and siblings) and not by parents’ educational level [in contrast with self-employed and conventional employees]. There are no significant coefficients related to VCP type (Ind- or Corp-) or prior entrepreneurial experience, which sets hybrid entrepreneurs apart from their intrapreneur and self-employed peers (see Tables 5 and 6).

Discussion

In this paper, the question was raised of what role do types of VCPs play in the subsequent career choice of graduates? In this study, the specific investigation of VCPs builds from the argument that this type of entrepreneurship education, situated in experience, facilitates development of entrepreneurial behavior (Lackeus and Williams-Middleton, 2015, etc.) which can be applied in subsequent careers (Alsos *et al.*, 2023). The majority of entrepreneurship education studies have focused on explaining either the development of intentions (Bae *et al.*, 2014; Nabi *et al.*, 2017) or on sustained behavior based on training interventions (Gielnik *et al.*, 2016, 2017). Relatively little is known about the relation between education and career, and the limited studies investigating this relationship do not address longitudinal impact on subsequent behavior (Elert *et al.*, 2020; Jones *et al.*, 2017).

The paper studies relatively uncommon master-level programs in entrepreneurship that combine experiential venture creation (independent venturing (Ind-VCPs) or corporate venturing (Corp-VCPs)), with high degrees of vicarious (peer-to-peer and team-based), as well as reflective (facilitative and consultative) learning. In this isolated population of students that have self-selected into an Ind-VCP or a Corp-VCP, there are varying degrees of prior entrepreneurial experience and entrepreneurial pedigree. This allows for study and comparison of the role, if any, the education plays in relation to prior entrepreneurial experience or entrepreneurial pedigree (exposure) when addressing career choice. In the following the three hypotheses are addressed and the authors interpretation of the findings.

The study found that **Hypothesis 3: Graduates from a VCP, with family members who have entrepreneurial experience (pedigree), will to a higher extent have entrepreneurial careers after graduating (as self-employed, intrapreneurs, or hybrids)**, was not supported for the sample as a

whole, with exception for graduates in the occupational form hybrid. A potential explanation of this finding might be that those graduates that are influenced by entrepreneurial pedigree have learned from both ups and downs of their parents' self-employed careers and that they therefore more "hedge their career" (i.e. select hybrid) than those without this pedigree. Another explanation could be that parents or family members know the value of prior industry knowledge or experience and that their recommendation would be to test the entrepreneurial career in a hybrid manner, avoiding loss of income or experience if failing. This hypothesis would benefit from further investigation.

Hypothesis 2: *Graduates from a VCP, that have entrepreneurial experience prior to the education, will to a higher extent have entrepreneurial careers after graduating (as self-employed, intrapreneurs, or hybrids)*, was confirmed but was found to be partially contingent on also having chosen an Ind-VCP rather than a Corp-VCP. When interpreting H2, the measure for entrepreneurial experience is directly connected to prior start-up experience, which might explain why significance is found for the self-employed occupational form, but not for intrapreneur occupational form. For future research, it would be interesting to investigate whether individuals with prior intrapreneurial experience would have the same entrepreneurial mindset as individuals with prior venture experience.

Hypothesis 1: *The type of entrepreneurship program (Ind-VCP or Corp-VCP) will be positively related to the type of occupation (self-employed or intrapreneur, respectively) is supported.* Graduates from the Corp-VCPs have a positive relationship with the occupational form intrapreneur, while graduates from Ind-VCPs have a positive relationship with the occupational form self-employed. There were no significant results regarding the hybrid occupational form, but this could be explained with this form consisting of both intrapreneurial activities and self-employment activities. As such, the design of an entrepreneurship education could therefore influence the career of the students, indicating that entrepreneurship education should not be treated as *one* education but the specialization of entrepreneurial type of career is broadening beyond the oftentimes focused start-up process.

When comparing H1 and H2, the strongest overall predictor of entrepreneurial career choice is the undertaking of a VCP and specifically a particular form of VCP, with entrepreneurial pedigree and prior experiences having secondary roles in early career choice. This indicates that program specification (Ind- or Corp-) influences which type of entrepreneurial career that graduates choose. However, on aggregate, and given the study's results, it seems plausible to argue that students engaging in one-year- or two-year-long master program in venture creation (where the pedagogical approach is built on learning through experience and the interplay between action and reflection (Hägglund and Kurczewska, 2020; Williams-Middleton and Donnellon, 2014)) provide positive behavioral attitudes to engage in entrepreneurial careers. The context specific venture creation settings of Ind-VCP and Corp-VCP, though built on the same pedagogical idea, result in different outcomes in early career choice. Though not explicitly studied here, it can be argued that the socialization and orientation of the two specific habitats influence the first career choice after graduation. Although there are plenty of other factors deciding career choice, the present study potentially reduces the intention-to-behavior gap (see Nabi *et al.*, 2017) through pointing toward the mitigating effect an education can have. Given the results, one can postulate that an educational process combining experiential, vicarious and reflective learning activities mitigate a shortage of entrepreneurial exposure, such as entrepreneurial pedigree or having individual prior experiences of running ventures. This would explain why students in the current VCP sample are not as affected by, e.g. prior experience and pedigree as found in prior studies (e.g. Davidsson and Honig, 2003; Veljkovic *et al.*, 2019). Future research should study this explanation and how these learnings can generate strong career-choice effects.

Conclusions, limitations and implications for future research and policy

To gain more understanding of entrepreneurship education influence on entrepreneurial careers, the purpose of the paper was to investigate the role that a VCP might have on mitigating or surpassing a lack of other antecedents of entrepreneurial careers. In particular, we focused on entrepreneurial pedigree and prior entrepreneurial experience. Basically, the educational context of a VCP, whether Ind-VCP or Corp-VCP, influences graduates' career choices (H1 supported). Although prior personal experience interacted with Ind-VCP making a career as self-employed more likely, this was not the case for Corp-VCP, when engaging in intrapreneurial careers (H2 partly supported). Entrepreneurial pedigree did not have any significant effect on career choice other than for hybrid entrepreneurs (H3 partly supported). Given these findings, a main conclusion is that entrepreneurial experience gained from VCPs influence graduates' immediate future entrepreneurial careers and to some degree more than prior entrepreneurial experience and entrepreneurial pedigree. Hence, many of the VCP graduates lacking prior entrepreneurial experience, develop entrepreneurial competencies (knowledge, skills and judgmental abilities) through the programs, which prepare them to engage in an entrepreneurial career from a broad perspective.

There are some important implications from this study. First, if we care about entrepreneurship education making a difference for not only intentions but behavior (as advocated by [Nabi et al., 2017](#)), then our current study provides promising evidence. Changed behaviors, manifested through career choices, can and arguably should be more addressed as "treatment effects" from entrepreneurial education. On a more critical note, and following the reasoning of [Biesta \(2007, 2009\)](#) but also more aligned with current discussions on the role and purpose of entrepreneurial education (see [Hägg and Jones, 2021](#); [Loi et al., 2022](#)), we see an important discussion emerging related to what type of entrepreneurial behavior we develop and urge future scholarly work to think critically around the theories, practices and exemplars that we bring into our teaching. Although our study is not primarily targeting what happens in the education, but how education impacts behavior, our results provide input for critically thinking about our role as educators and how we might influence decisions and behavior developed by the students. Importantly, if we are taking responsibility in the time of the Anthropocene and engage in more sustainable behavior within the limits of the world's resources, we as educators have a role to play in what we decide to address in the educational setting ([Dodd et al., 2022](#)).

Secondly, high-end education in entrepreneurship can develop graduates that engage not only as self-employed, but also as intrapreneurs (working with initiating and developing new opportunities) in established businesses. Our findings on intrapreneurial employment confirms a need for entrepreneurial competencies in such businesses and shows that VCPs contribute to society through different means, not only by developing new ventures.

Third, at least for the three studied Scandinavian VCPs, having a high degree of reflective experiential venture learning, the importance of prior entrepreneurial experience and exposure can be mitigated. Hence, universities and other educational institutions, as well as governments, have reason to invest into entrepreneurial education to satisfy not only needs of more entrepreneurial competence development, but also for such competences being possible to diffuse beyond those with privileged socio-economic backgrounds.

Finally, given that the studied VCPs combine experiential learning with more visceral and reflective forms, a final implication is to pay more attention to that combination and to consider the use of this as replacement for years of more singular experiential or visceral (from pedigree) learning.

This study is not without limitations. A main limitation that needs to be considered when interpreting the results is the limited population of VCP graduates. First, these graduates self-select into the programs and have an interest in learning entrepreneurship. There might be individuals with an entrepreneurial pedigree, not sensing they need entrepreneurship education to pursue an entrepreneurial career. This group is an unknown in this study, and

their participation in these programs could have influenced the results. Moreover, other types of entrepreneurship education might not have the same effects. Cultural factors and age differences are examples of factors not controlled for. While the results are intriguing, based on three different samples and novel in addressing the gap between intentions to actual behavior, there are many other variables that impact and build up to the career choice taken, which can be considered. Examples could be graduates' choice in location after graduation, the financial situation of the country or region and the rate of employment in the region. Future studies need to control for these potential variables. Give this, there is value in future research qualitatively investigating the potential of combining experiential, vicarious and reflective learning, as they occur in VCPs. Deeper knowledge is needed regarding prior experience and pedigree is mitigated through combined learning provided through VCPs.

Note

1. At the time of data collection the Corp-VCP existed at Lund University. That track has now been canceled.

References

- Alexander, P.A., Schallert, D.L. and Hare, V.C. (1991), "Coming to terms: how researchers in learning and literacy talk about knowledge", *Review of Educational Research*, Vol. 61 No. 3, pp. 315-343, doi: [10.3102/00346543061003315](https://doi.org/10.3102/00346543061003315).
- Alsos, G., Hägg, G., Lundqvist, M., Politis, D., Stockhaus, M., Williams-Middleton, K. and Djupdal, K. (2023), "Graduates of venture creation programs – where do they apply their entrepreneurial competencies?", *Small Business Economics*, Vol. 60 No. 1, pp. 133-155, doi: [10.1007/s11187-022-00641-6](https://doi.org/10.1007/s11187-022-00641-6).
- Alvesson, M. and Sandberg, J. (2014), "Habitat and habitus: boxed-in versus box-breaking research", *Organization Studies*, Vol. 35 No. 7, pp. 967-987, doi: [10.1177/0170840614530916](https://doi.org/10.1177/0170840614530916).
- Arregle, J. L., Batjargal, B., Hitt, M. A., Webb, J. W., Miller, T. and Tsui, A. S. (2015), "Family ties in entrepreneurs' social networks and new venture growth", *Entrepreneurship Theory and Practice*, Vol. 39 No. 2, pp. 313-344, doi: [10.1111/etap.12044](https://doi.org/10.1111/etap.12044).
- Arthur, M.B. (2014), "The boundaryless career at 20: where do we stand, and where can we go?", *Career Development International*, Vol. 19 No. 6, pp. 627-640, doi: [10.1108/CDI-05-2014-0068](https://doi.org/10.1108/CDI-05-2014-0068).
- Åstebro, T., Bazzazian, N. and Braguinsky, S. (2012), "Startups by recent university graduates and their faculty: implications for university entrepreneurship policy", *Research Policy*, Vol. 41 No. 4, pp. 663-677, doi: [10.1016/j.respol.2012.01.004](https://doi.org/10.1016/j.respol.2012.01.004).
- 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*, Vol. 38 No. 2, pp. 217-254, doi: [10.1111/etap.12095](https://doi.org/10.1111/etap.12095).
- Ball, C. (1989), *Towards an "Enterprising" Culture: A Challenge for Education and Training (No. 4)*, Organisation for Economic Co-operation and Development, Paris.
- Barrett, M. (2014), "Revisiting women's entrepreneurship: insights from the family-firm context and radical subjectivist economics", *International Journal of Gender and Entrepreneurship*, Vol. 6 No. 3, pp. 231-254, doi: [10.1108/ijge-09-2012-0037](https://doi.org/10.1108/ijge-09-2012-0037).
- Berglann, H., Moen, E. R., Røed, K. and Skogstrøm, J. F. (2011), "Entrepreneurship: origins and returns", *Labour Economics*, Vol. 18 No. 2, pp. 180-193, doi: [10.1016/j.labeco.2010.10.002](https://doi.org/10.1016/j.labeco.2010.10.002).
- Biesta, G. (2007), "Why 'what works' won't work: evidence-based practice and the democratic deficit in educational research", *Educational Theory*, Vol. 57 No. 1, pp. 1-22, doi: [10.1111/j.1741-5446.2006.00241.x](https://doi.org/10.1111/j.1741-5446.2006.00241.x).
- Biesta, G. (2009), "Good education in an age of measurement: on the need to reconnect with the question of purpose in education", *Educational Assessment, Evaluation and Accountability (Formerly: Journal of Personnel Evaluation in Education)*, Vol. 21 No. 1, pp. 33-46, doi: [10.1007/s11092-008-9064-9](https://doi.org/10.1007/s11092-008-9064-9).

- Bird, B. (2019), "Toward a theory of entrepreneurial competency", *Advances in Entrepreneurship, Firm Emergence and Growth*, Vol. 21 No. 2, pp. 115-131.
- Bosma, N., Wennekers, S. and Amorós, J. E. (2012), *Global Entrepreneurship Monitor 2011 Extended Report: Entrepreneurs and Entrepreneurial Employees across the Globe*, Global Entrepreneurship Research Association, London, Vol. 59.
- Carr, J.C. and Sequeira, J.M. (2007), "Prior family business exposure as intergenerational influence and entrepreneurial intent: a theory of planned behavior approach", *Journal of Business Research*, Vol. 60 No. 10, pp. 1090-1098, doi: [10.1016/j.jbusres.2006.12.016](https://doi.org/10.1016/j.jbusres.2006.12.016).
- Carrier, C. (2005), "Pedagogical challenges in entrepreneurship education", in Kyrö, P. and Carrier, C. (Eds), *The Dynamics of Learning Entrepreneurship in a Cross-Cultural University Context*, University of Tampere, Hämeenlinna, pp. 136-158.
- Cassar, G. (2014), "Industry and startup experience on entrepreneur forecast performance in new firms", *Journal of Business Venturing*, Vol. 29 No. 1, pp. 137-151, doi: [10.1016/j.jbusvent.2012.10.002](https://doi.org/10.1016/j.jbusvent.2012.10.002).
- Chatzichristou, S.S. and Henry, N. (2014), "Expert group on indicators on entrepreneurial learning and competence: final report", in GHK (Ed.) *Brussels: European Commission*.
- 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*, Vol. 9 No. 5, pp. 371-395.
- Cope, J. (2005), "Toward a dynamic learning perspective of entrepreneurship", *Entrepreneurship Theory and Practice*, Vol. 29 No. 4, pp. 373-397, doi: [10.1111/j.1540-6520.2005.00090.x](https://doi.org/10.1111/j.1540-6520.2005.00090.x).
- Corbett, A.C. (2005), "Experiential learning within the process of opportunity identification and exploitation", *Entrepreneurship Theory and Practice*, Vol. 29 No. 4, pp. 473-491, doi: [10.1111/j.1540-6520.2005.00094.x](https://doi.org/10.1111/j.1540-6520.2005.00094.x).
- Daniel, A.D. (2016), "Fostering an entrepreneurial mindset by using a design thinking approach in entrepreneurship education", *Industry and Higher Education*, Vol. 30 No. 3, pp. 215-223, doi: [10.1177/0950422216653195](https://doi.org/10.1177/0950422216653195).
- Davidsson, P. and Honig, B. (2003), "The role of social and human capital among nascent entrepreneurs", *Journal of Business Venturing*, Vol. 18 No. 3, pp. 301-331, doi: [10.1016/s0883-9026\(02\)00097-6](https://doi.org/10.1016/s0883-9026(02)00097-6).
- Dodd, S., Lage-Arias, S., Berglund, K., Jack, S., Hytti, U. and Verduijn, K. (2022), "Transforming enterprise education: sustainable pedagogies of hope and social justice", *Entrepreneurship and Regional Development*, Vol. 34 Nos 7-8, pp. 686-700, doi: [10.1080/08985626.2022.2071999](https://doi.org/10.1080/08985626.2022.2071999).
- Dou, J., Su, E., Li, S. and Holt, D.T. (2021), "Transgenerational entrepreneurship in entrepreneurial families: what is explicitly learned and what is successfully transferred?", *Entrepreneurship and Regional Development*, Vol. 33 Nos 5-6, pp. 427-441.
- Dyer, W.G. (1995), "Toward a theory of entrepreneurial careers", *Entrepreneurship Theory and Practice*, Vol. 19 No. 2, pp. 7-21, doi: [10.1177/104225879501900202](https://doi.org/10.1177/104225879501900202).
- Dyer, W.G. and Handler, W. (1994), "Entrepreneurship and family business: exploring the connections", *Entrepreneurship Theory and Practice*, Vol. 19 No. 1, pp. 71-83, doi: [10.1177/104225879401900105](https://doi.org/10.1177/104225879401900105).
- Eesley, C.E. and Lee, Y.S. (2021), "Do university entrepreneurship programs promote entrepreneurship?", *Strategic Management Journal*, Vol. 42 No. 4, pp. 833-861, doi: [10.1002/smj.3246](https://doi.org/10.1002/smj.3246).
- Eesley, C.E. and Roberts, E.B. (2012), "Are you experienced or are you talented? When does innate talent versus experience explain entrepreneurial performance?", *Strategic Entrepreneurship Journal*, Vol. 6 No. 3, pp. 207-219, doi: [10.1002/sej.1141](https://doi.org/10.1002/sej.1141).
- Elert, N., Wennberg, K. and Sjöo, K. (2020), "When less is more: why limited entrepreneurship education may result in better entrepreneurial outcomes", *International Review of Entrepreneurship*.

- European Commission (2013), *Entrepreneurship 2020 Action Plan: Reigniting the Entrepreneurial Spirit in Europe*, European Commission, Brussels.
- Farmer, S.M., Yao, X. and Kung–Mcintyre, K. (2011), “The behavioral impact of entrepreneur identity aspiration and prior entrepreneurial experience”, *Entrepreneurship Theory and Practice*, Vol. 35 No. 2, pp. 245-273, doi: [10.1111/j.1540-6520.2009.00358.x](https://doi.org/10.1111/j.1540-6520.2009.00358.x).
- Fayolle, A. and Gailly, B. (2015), “The impact of entrepreneurship education on entrepreneurial attitudes and intention: hysteresis and persistence”, *Journal of Small Business Management*, Vol. 53 No. 1, pp. 75-93, doi: [10.1111/jsbm.12065](https://doi.org/10.1111/jsbm.12065).
- Feldmann, M., Lukes, M. and Uhlaner, L. (2020), “Disentangling succession and entrepreneurship gender gaps: gender norms, culture, and family”, *Small Business Economics*, Vol. 58 No. 2, pp. 997-1013, doi: [10.1007/s11187-020-00430-z](https://doi.org/10.1007/s11187-020-00430-z).
- Garavan, T.N. and O’Cinneide, B. (1994), “Entrepreneurship education and training programmes: a review and evaluation - Part 1”, *Journal of European Industrial Training*, Vol. 18 No. 8, pp. 3-12, doi: [10.1108/03090599410068024](https://doi.org/10.1108/03090599410068024).
- Gielnik, M. M., Frese, M., Kahara-Kawuki, A., Wasswa Katono, I., Kyejjusa, S., Ngoma, M., Munene, J., Namatovu-Dawa, R., Nansubuga, F., Orobia, L., Oyugi, J., Sejjaaka, S., Sserwanga, A., Walter, T., Bischoff, K.M. and Dlugosch, T. J. (2015), “Action and action-regulation in entrepreneurship: evaluating a student training for promoting entrepreneurship”, *Academy of Management Learning and Education*, Vol. 14 No. 1, pp. 69-94, doi: [10.5465/amle.2012.0107](https://doi.org/10.5465/amle.2012.0107).
- Gielnik, M. M., Frese, M., Bischoff, K. M., Muhangi, G. and Omoo, F. (2016), “Positive impact of entrepreneurship training on entrepreneurial behavior in a vocational training setting”, *Africa Journal of Management*, Vol. 2 No. 3, pp. 330-348, doi: [10.1080/23322373.2016.1206804](https://doi.org/10.1080/23322373.2016.1206804).
- Gielnik, M. M., Uy, M. A., Funken, R. and Bischoff, K. M. (2017), “Boosting and sustaining passion: a long-term perspective on the effects of entrepreneurship training”, *Journal of Business Venturing*, Vol. 32 No. 3, pp. 334-353, doi: [10.1016/j.jbusvent.2017.02.003](https://doi.org/10.1016/j.jbusvent.2017.02.003).
- Gruber, M., Kim, S.M. and Brinckmann, J. (2015), “What is an attractive business opportunity? An empirical study of opportunity evaluation decisions by technologists, managers, and entrepreneurs”, *Strategic Entrepreneurship Journal*, Vol. 9 No. 3, pp. 205-225, doi: [10.1002/sej.1196](https://doi.org/10.1002/sej.1196).
- Hager, P. and Gonczy, A. (1996), “What is competence?”, *Medical Teacher*, Vol. 18 No. 1, pp. 15-18, doi: [10.3109/01421599609040255](https://doi.org/10.3109/01421599609040255).
- Hägg, G. (2017), *Experiential Entrepreneurship Education: Reflective Thinking as a Counterbalance to Action for Developing Entrepreneurial Knowledge. Compilation*, Lund University, MediaTryck, Lund.
- Hägg, G. and Gabrielsson, J. (2019), “A systematic literature review of the evolution of pedagogy in entrepreneurial education research”, *International Journal of Entrepreneurial Behavior and Research*, Vol. 26 No. 5, pp. 829-861, doi: [10.1108/ijeb-04-2018-0272](https://doi.org/10.1108/ijeb-04-2018-0272).
- Hägg, G. and Jones, C. (2021), “Educating towards the prudent entrepreneurial self—an educational journey including agency and social awareness to handle the unknown”, *International Journal of Entrepreneurial Behavior and Research*, Vol. 27 No. 9, pp. 82-103, doi: [10.1108/ijeb-10-2020-0668](https://doi.org/10.1108/ijeb-10-2020-0668).
- Hägg, G. and Kurczewska, A. (2016), “Connecting the dots—A discussion on key concepts in contemporary entrepreneurship education”, *Education+Training*, Vol. 58 Nos 7-8, pp. 700-714, doi: [10.1108/et-12-2015-0115](https://doi.org/10.1108/et-12-2015-0115).
- Hägg, G. and Kurczewska, A. (2020), “Towards a learning philosophy based on experience in entrepreneurship education”, *Entrepreneurship Education and Pedagogy*, Vol. 3 No. 2, pp. 129-153, doi: [10.1117/2515127420910679](https://doi.org/10.1117/2515127420910679).
- Hägg, G. and Kurczewska, A. (2022), *Entrepreneurship Education: Scholarly Progress and Future Challenges*, Routledge Focus Series, New York, Routledge.

- Hägg, G., Politis, D. and Alsos, G.A. (2023), "Does gender balance in entrepreneurship education make a difference to prospective start-up behaviour?", *Education+ Training*, Vol. 65 No. 4, pp. 630-653.
- Hamidi, D. Y., Wennberg, K. and Berglund, H. (2008), "Creativity in entrepreneurship education", *Journal of Small Business and Enterprise Development*, Vol. 15 No. 2, pp. 304-320, doi: [10.1108/14626000810871691](https://doi.org/10.1108/14626000810871691).
- Hamilton, E. (2011), "Entrepreneurial learning in family business: a situated learning perspective", *Journal of Small Business and Enterprise Development*, Vol. 8 No. 1, pp. 8-26, doi: [10.1108/dlo-2011.08125daa.012](https://doi.org/10.1108/dlo-2011.08125daa.012).
- Haneberg, D.H. and Aadland, T. (2019), "Learning from venture creation in higher education", *Industry and Higher Education*, Vol. 34 No. 3, pp. 121-137, doi: [10.1177/0950422219884020](https://doi.org/10.1177/0950422219884020).
- Henry, N. and Chatzichristou, S. (2014), "Expert group on indicators on entrepreneurial learning and competence: final report", in GHK, I. (Ed.), *Brussels: European Commission*.
- Heslin, P.A., Keating, L.A. and Ashford, S.J. (2020), "How being in learning mode may enable a sustainable career across the lifespan", *Journal of Vocational Behavior*, Vol. 117, 103324, doi: [10.1016/j.jvb.2019.103324](https://doi.org/10.1016/j.jvb.2019.103324).
- Hisrich, R.D. (1990), "Entrepreneurship/intrapreneurship", *American Psychologist*, Vol. 45 No. 2, pp. 209-222, doi: [10.1037/0003-066x.45.2.209](https://doi.org/10.1037/0003-066x.45.2.209).
- Jo, H. and Lee, J. (1996), "The relationship between an entrepreneur's background and performance in a new venture", *Technovation*, Vol. 16 No. 4, pp. 161-211, doi: [10.1016/0166-4972\(96\)89124-3](https://doi.org/10.1016/0166-4972(96)89124-3).
- Jones, C. (2010), "Entrepreneurship education: revisiting our role and its purpose", *Journal of Small Business and Enterprise Development*, Vol. 17 No. 4, pp. 500-513, doi: [10.1108/14626001011088697](https://doi.org/10.1108/14626001011088697).
- Jones, P., Pickernell, D., Fisher, R. and Netana, C. (2017), "A tale of two universities: graduates perceived value of entrepreneurship education", *Education + Training*, Vol. 59 Nos 7/8, pp. 689-705, doi: [10.1108/et-06-2017-0079](https://doi.org/10.1108/et-06-2017-0079).
- Jones-Evans, D., Williams, W. and Deacon, J. (2000), "Developing entrepreneurial graduates: an action-learning approach", *Education+ Training*, Vol. 42 Nos 4/5, pp. 282-288, doi: [10.1108/00400910010347759](https://doi.org/10.1108/00400910010347759).
- Katz, J.A. (2007), "Education and training in entrepreneurship", in Baum, J.R., Frese, M. and Baron, R.A. (Eds), *The Psychology of Entrepreneurship*, Lawrence Erlbaum Associates, Mahwah, NJ, pp. 209-236.
- Kirzner, I.M. (1997), "Entrepreneurial discovery and the competitive market process: an Austrian approach", *Journal of Economic Literature*, Vol. 35 No. 1, pp. 60-85.
- Kuratko, D.F. and Morris, M.H. (2018), "Corporate entrepreneurship: a critical challenge for educators and researchers", *Entrepreneurship Education and Pedagogy*, Vol. 1 No. 1, pp. 42-60, doi: [10.1177/2515127417737291](https://doi.org/10.1177/2515127417737291).
- Lackeus, M. and Williams-Middleton, K. (2015), "Venture creation programs: bridging entrepreneurship education and technology transfer", *Education + Training*, Vol. 57 No. 1, pp. 48-73, doi: [10.1108/et-02-2013-0013](https://doi.org/10.1108/et-02-2013-0013).
- Lackeus, M., Lundqvist, M., Williams Middleton, K. and Inden, J. (2020), "The entrepreneurial employee in the public and private sector – what, why, how", in Bacigalupo, M. (Ed.) *EUR 30108 EN*, Publications Office of the European Union, Luxembourg.
- Liñán, F., Rodríguez-Cohard, J.C. and Rueda-Cantuche, J.M. (2011), "Factors affecting entrepreneurial intention levels: a role for education", *International Entrepreneurship and Management Journal*, Vol. 7 No. 2, pp. 195-218, doi: [10.1007/s11365-010-0154-z](https://doi.org/10.1007/s11365-010-0154-z).
- Loi, M., Fayolle, A., van Gelderen, M., Riot, E., Refai, D., Higgins, D., Verzat, C., Salusse, M.A.Y., Lamy, E. and Cavarretta, F. (2022), "Entrepreneurship education at the crossroads: challenging taken-for-granted assumptions and opening new perspectives", *Journal of Management Inquiry*, Vol. 31 No. 2, pp. 123-134, doi: [10.1177/10564926211042222](https://doi.org/10.1177/10564926211042222).

- Martin, B.C., McNally, J.J. and Kay, M.J. (2013), "Examining the formation of human capital in entrepreneurship: a meta-analysis of entrepreneurship education outcomes", *Journal of Business Venturing*, Vol. 28 No. 2, pp. 211-224, doi: [10.1016/j.jbusvent.2012.03.002](https://doi.org/10.1016/j.jbusvent.2012.03.002).
- Matlay, H. (2008), "The impact of entrepreneurship education on entrepreneurial outcomes", *Journal of Small Business and Enterprise Development*, Vol. 15 No. 2, pp. 382-396, doi: [10.1108/14626000810871745](https://doi.org/10.1108/14626000810871745).
- McGee, J.E., Peterson, M., Mueller, S.L. and Sequeira, J.M. (2009), "Entrepreneurial self-efficacy: refining the measure", *Entrepreneurship Theory and Practice*, Vol. 33 No. 4, pp. 965-988, doi: [10.1111/j.1540-6520.2009.00304.x](https://doi.org/10.1111/j.1540-6520.2009.00304.x).
- McGrath, R.G. and MacMillan, I.C. (2000), *The Entrepreneurial Mindset: Strategies for Continuously Creating Opportunity in an Age of Uncertainty*, Harvard Business Press, Cambridge.
- Morris, M. H. and Liguori, E. (2016), "Preface: teaching reason and the unreasonable", in *Annals of Entrepreneurship Education and Pedagogy-2016*, Edward Elgar Publishing, pp. xiv-xxii.
- Morris, M. H., Kuratko, D. F., Schindehutte, M. and Spivack, A. J. (2012), "Framing the entrepreneurial experience", *Entrepreneurship Theory and Practice*, Vol. 36 No. 1, pp. 11-40, doi: [10.1111/j.1540-6520.2011.00471.x](https://doi.org/10.1111/j.1540-6520.2011.00471.x).
- Nabi, G., Liñán, F., Fayolle, A., Krueger, N. and Walmsley, A. (2017), "The impact of entrepreneurship education in higher education: a systematic review and research agenda", *Academy of Management Learning and Education*, Vol. 16 No. 2, pp. 277-299, doi: [10.5465/amle.2015.0026](https://doi.org/10.5465/amle.2015.0026).
- Parker, S.C. (2013), "Do serial entrepreneurs run successively better-performing businesses?", *Journal of Business Venturing*, Vol. 28 No. 5, pp. 652-666, doi: [10.1016/j.jbusvent.2012.08.001](https://doi.org/10.1016/j.jbusvent.2012.08.001).
- Politis, D. (2005), "The process of entrepreneurial learning: a conceptual framework", *Entrepreneurship Theory and Practice*, Vol. 29 No. 4, pp. 399-424, doi: [10.1111/j.1540-6520.2005.00091.x](https://doi.org/10.1111/j.1540-6520.2005.00091.x).
- 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*, Vol. 14 No. 2, pp. 187-204, doi: [10.5465/amle.2012.0293](https://doi.org/10.5465/amle.2012.0293).
- Sarasvathy, S.D. (2008), *Effectuation: Elements of Entrepreneurial Expertise*, Edward Elgar Publishing, Cheltenham.
- Shane, S. (2000), "Prior knowledge and the discovery of entrepreneurial opportunities", *Organization Science*, Vol. 11 No. 4, pp. 448-469.
- Shepherd, D.A. and DeTienne, D.R. (2005), "Prior knowledge, potential financial reward, and opportunity identification", *Entrepreneurship Theory and Practice*, Vol. 29 No. 1, pp. 91-112, doi: [10.1111/j.1540-6520.2005.00071.x](https://doi.org/10.1111/j.1540-6520.2005.00071.x).
- Shi, H.X., Shepherd, D.M. and Schmidts, T. (2015), "Social capital in entrepreneurial family businesses: the role of trust", *International Journal of Entrepreneurial Behaviour and Research*, Vol. 21 No. 6, pp. 814-841, doi: [10.1108/ijeb-04-2015-0090](https://doi.org/10.1108/ijeb-04-2015-0090).
- Smith, B.R., Matthews, C.H. and Schenkel, M.T. (2009), "Differences in entrepreneurial opportunities: the role of tacitness and codification in opportunity identification", *Journal of Small Business Management*, Vol. 47 No. 1, pp. 38-57, doi: [10.1111/j.1540-627X.2008.00261.x](https://doi.org/10.1111/j.1540-627X.2008.00261.x).
- Steyaert, C. and Katz, J. (2004), "Reclaiming the space of entrepreneurship in society: geographical, discursive and social dimensions", *Entrepreneurship and Regional Development*, Vol. 16 No. 3, pp. 179-196, doi: [10.1080/0898562042000197135](https://doi.org/10.1080/0898562042000197135).
- Turro, A., Noguera, M. and Urbano, D. (2020), "Antecedents of entrepreneurial employee activity: does gender play a role?", *International Journal of Entrepreneurial Behaviour and Research*, Vol. 26 No. 8, pp. 1685-1706, doi: [10.1108/ijeb-09-2019-0529](https://doi.org/10.1108/ijeb-09-2019-0529).

- Ucbasaran, D., Wright, M., Westhead, P. and Busenitz, L. W. (2003), "The impact of entrepreneurial experience on opportunity identification and exploitation: habitual and novice entrepreneurs", *Cognitive Approaches to Entrepreneurship Research*, Vol. 6, pp. 231-263.
- Van Gelderen, M., Kautonen, T. and Fink, M. (2015), "From entrepreneurial intentions to actions: self-control and action-related doubt, fear, and aversion", *Journal of Business Venturing*, Vol. 30 No. 5, pp. 655-673, doi: [10.1016/j.jbusvent.2015.01.003](https://doi.org/10.1016/j.jbusvent.2015.01.003).
- Veljkovic, S., Maric, M., Subotic, M., Dudic, B. and Greguš, M. (2019), "Family entrepreneurship and personal career preferences as the factors of differences in the development of entrepreneurial potential of students", *Sustainability*, Vol. 11 No. 20, p. 5693, doi: [10.3390/su11205693](https://doi.org/10.3390/su11205693).
- von Mises, L. (1949), *Human Action: A Treatise on Economics*, Ludwig von Mises Institute, Auburn, Alabama.
- Walter, S. G. and Block, J. H. (2016), "Outcomes of entrepreneurship education: an institutional perspective", *Journal of Business Venturing*, Vol. 31 No. 2, pp. 216-233, doi: [10.1016/j.jbusvent.2015.10.003](https://doi.org/10.1016/j.jbusvent.2015.10.003).
- West, G.P., III and Noel, T.W. (2009), "The impact of knowledge resources on new venture performance", *Journal of Small Business Management*, Vol. 47 No. 1, pp. 1-22, doi: [10.1111/j.1540-627X.2008.00259.x](https://doi.org/10.1111/j.1540-627X.2008.00259.x).
- Williams-Middleton, K. (2013), "Becoming entrepreneurial: gaining legitimacy in the nascent phase", *International Journal of Entrepreneurial Behaviour and Research*, Vol. 19 No. 4, pp. 404-424, doi: [10.1108/ijebr-04-2012-0049](https://doi.org/10.1108/ijebr-04-2012-0049).
- Williams-Middleton, K. and Donnellon, A. (2014), "Personalizing entrepreneurial learning: a pedagogy for facilitating the know why", *Entrepreneurship Research Journal*, Vol. 4 No. 2, pp. 167-204, doi: [10.1515/erj-2013-0040](https://doi.org/10.1515/erj-2013-0040).
- Williams-Middleton, K. and Donnellon, A. (2017), "Learning to become entrepreneurial/fostering entrepreneurial identity and habits", in Duening, T.N. and Metzger, M.L. (Eds), *Entrepreneurial Identity: the Process of Becoming an Entrepreneur*, Edward Elgar, Cheltenham, pp. 103-126.
- Winborg, J. and Hägg, G. (2022), "The role of work-integrated learning in preparing students for a corporate entrepreneurial career", *Education+ Training*, Vol. 65 No. 4, pp. 674-696, doi: [10.1108/et-05-2021-0196](https://doi.org/10.1108/et-05-2021-0196).
- Zaring, O., Gifford, E. and McKelvey, M. (2016), "Tillståndet för utbildningar i entreprenörskap vid Sveriges lärosäten - en lägesrapport", in McKelvey, M. and Zaring, O. (Eds), *Sveriges Entreprenöriella Ekosystem - Företag, Akademi, Politik (The Swedish Entrepreneurial Ecosystem)*, ESBRI, Stockholm, Sweden, pp. 202-214.
- Zellweger, T., Sieger, P. and Halter, F. (2011), "Should I stay or should I go? Career choice intentions of students with family business background", *Journal of Business Venturing*, Vol. 26 No. 5, pp. 521-536, doi: [10.1016/j.jbusvent.2010.04.001](https://doi.org/10.1016/j.jbusvent.2010.04.001).
- Zhao, W. W., Liu, X. and Zhang, H. (2021), "Family embeddedness and medical students' interest for entrepreneurship as an alternative career choice: evidence from China", *Frontiers in Psychology*, Vol. 11, p. 593235, doi: [10.3389/fpsyg.2020.593235](https://doi.org/10.3389/fpsyg.2020.593235).

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