

FILLING IN THE BLANKS? THE IMPACT OF ENTREPRENEURSHIP EDUCATION ON EUROPEAN HIGH SCHOOL STUDENTS

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INTRODUCTION

Policymakers generally believe that new venture formation is instrumental for economic growth and innovation (Von Graevenitz, Harhoff, & Weber, 2010). Empirical research supports this notion (Van Praag & Versloot, 2007). Moreover, in today's fast-changing economy the ability to be entrepreneurial in many different contexts is viewed as increasingly important (Frese, Rousseau, & Wiklund, 2014). To boost levels of entrepreneurship and spread the entrepreneurial spirit, educational initiatives are promoted and implemented around the globe (Fayolle, 2000). These educational programs build on the assumption that entrepreneurial skills can be taught and that intentions to start a business can be awakened by such interventions (Oosterbeek, Van Praag, & Ijsselstein, 2010).

To date there is still little evidence on the optimal timing of such interventions or on which types of students benefit most from participation in an entrepreneurship education program (Lyons & Zhang, 2018; Fayolle & Gailly, 2015). The first objective of this paper is to provide causal evidence on the extent to which entrepreneurship education programs constitute an effective policy tool to promote entrepreneurial self-efficacy, attitudes, and intentions among high school students. The second goal of this paper is to gain insights into the differences in the treatment effect among different social subgroups. In particular, we investigate whether entrepreneurship education affects the development of students with an entrepreneurial background and of students with low social status differently.

Empirically, the strengths of this paper are manifold. By conducting a randomized controlled trial with a large number of secondary school students, internal validity is high and causal inferences can be drawn about the impact of the entrepreneurship program 'Youth Start – Entrepreneurial Challenges'.¹ In addition, focusing on a large-scale international educational initiative involving four European countries (Austria, Portugal, Luxemburg, and Slovenia) and

167 different school classes represents a unique setting, which adds to the generalizability of our results. Moreover, the educational intervention was mandatory for all students in a given class, thus ensuring that self-selection does not bias our results.

THEORY AND HYPOTHESES

We base our theoretical discussion about the effects of entrepreneurship education on students' entrepreneurial intentions on the Theory of Planned Behavior (Ajzen, 1991) which posits that intentions are shaped by means of attitudes, subjective norms and perceived behavioral control. This theoretical perspective is complimented by Social Cognitive Career Theory (SCCT) (Lent, Brown, & Hackett, 2000). The focus of SCCT is on how several cognitive, person-specific variables (e.g. self-efficacy, outcome expectations, interests, and goals) interact with other aspects of an individual and their environment to influence career development (Lent et al., 2000). The motivational construct of self-efficacy, defined as an individual's confidence in their ability to organize and execute the courses of action required to produce certain outcomes (Bandura, 1997), is central to the model. Prior research has shown that entrepreneurship education can have an important impact on early entrepreneurial skill formation by teaching students how to manage uncertainty, think creatively, and assemble and organize resources (Oosterbeek et al., 2010; Huber, Sloof, & Van Praag, 2014). Moreover, such educational initiatives allow children to develop confidence in these abilities by requiring them to engage in entrepreneurial activities through in-class experimentation or behavioral simulations. Based on these theoretical considerations, we develop a set of hypotheses proposing a positive influence of entrepreneurship education on the development of entrepreneurial self-efficacy, attitudes towards entrepreneurship, as well as entrepreneurial intentions.

However, environmental factors can shape learning experiences and thereby influence the development of self-efficacy and outcome expectations, which then spark vocational interests (Lent et al., 2000). These environmental variables may both moderate and directly affect the processes by which individuals make and implement career-related choices (Lent et al., 2000). This suggests that *ex ante* differences among students may influence the extent to which benefits can be reaped. In this study we focus on two environmental factors in particular: prior entrepreneurial experience and differences in social status. First, drawing on research on entrepreneurial role models (e.g. Dyer & Handler, 1994; Matthews & Moser, 1996), entrepreneurial activities during childhood (Dalton & Holdaway, 1989) and prior exposure to entrepreneurship education (e.g. Krueger, 1993; Peterman & Kennedy, 2003), we argue that two mechanisms seem equally plausible in regards to the influence entrepreneurial experience has on the effects of entrepreneurship education. On the one hand, students with stronger entrepreneurial predisposition may be better able to utilize the knowledge and resources provided by the program and are thus faster in acquiring entrepreneurial skills, developing confidence in their abilities, and forming intentions of becoming an entrepreneur (Lyons & Zhang, 2018; Hahn, Minola, Van Gils, & Huybrechts, 2017). On the other hand, these children may already have formed the necessary attitudes and intentions and are confident in their skills even prior to educational intervention. One may therefore expect that students with high levels of entrepreneurial predisposition benefit relatively less from entrepreneurship education at the margin (Lyons & Zhang, 2018; Fayolle & Gailly, 2015). Second, based on research about the influence of the social background of inventors (Akcigit, Grigsby, & Nicholas, 2017; Bell, Chetty, Jaravel, Petkova, & Van Reenen, 2018) and entrepreneurs (e.g. Cox & Jennings, 1995; Collins &

Moore, 1964; Drennan, Kennedy, & Renfrow, 2005), as well as how social background influences academic achievement (e.g. Becker & Luthar, 2002; Schlee, Mullis, & Shriner, 2009), we also expect that entrepreneurship education will have heterogeneous effects depending on the social background of the participants. Here again there are two competing mechanisms. First, children from impoverished socio-economic backgrounds could find it more difficult to develop confidence in their entrepreneurial skills and hence evaluate the entrepreneurial career path as less feasible. However, research has also shown schooling in general to be more effective for children of less-educated parents (Glaeser & Mare, 2001). Since we do not know which of the described mechanisms will dominate, we hypothesize that the program will have heterogeneous effects on the participants depending on their prior level of exposure to entrepreneurship as well as their socio-economic status.

RESEARCH DESIGN

Context, Design and Data Collection

The entrepreneurship education program investigated in this paper is a European policy experimentation project known as Youth Start – Entrepreneurial Challenges. The learning program was developed with the aim of improving students' chances in the labor market and expanding their outlook on life by increasing children's desire to participate in entrepreneurial activities and fostering core competencies. One distinctive feature of this educational initiative is that it embeds entrepreneurship education in teachers' ordinary curricula through structured and codified instructional units suitable for multiple topics and aligned with general learning goals. The program thus represents an alternative to formalized, stand-alone interventions with a strong focus on venture creation that have been commonly evaluated in prior studies of entrepreneurship education (e.g. Elert, Andersson, & Wennberg, 2015).

In this paper the focus will be on secondary school students. Educational units at the secondary school level are configured as 17 distinct challenges along three themes (entrepreneurial core skills, culture and civic education) with well-defined teaching and learning goals. The challenges vary in extensiveness. While some encompass only few educational units and can be completed during a single school day, others need to be implemented over many weeks. Each challenge offers a variety of tasks, to work on aspects such as initiative, motivation, innovation, confidence, and social participation, with the common goal of encouraging openness to new ideas and creative idea implementation. All teachers involved in the Youth Start program receive special training on how to implement the program. Precise teaching material tailored to the students at secondary school levels is provided for each educational unit.

To assess the effectiveness of the Youth Start program we conducted a large-scale randomized field experiment. Schools interested in the program could register at the respective ministry of education in their country and were then randomly divided into a treatment and a control group. The schools assigned to the control group were not excluded from using the learning program completely, but were allowed to participate with a new cohort in the subsequent school year. Schools which participated in the program in one year thus functioned as a control group in the next year. This wait-listed control group approach assured that all schools eventually received the educational intervention, but implemented it in different school years.

Randomization was performed at the school level to avoid contamination by peer effects because many educational activities (e.g. excursions, fairs, etc.) were visible to other students. The design

of the field experiment therefore allows us to measure the counterfactual of how students would have developed if the intervention had not occurred. At the start of the program, the mean age of students in all countries was 16 years.

The randomized controlled trial was implemented in three consecutive school years: 2015/16, 2016/17 and 2017/18. The first round in 2015/16 served as a trial run. Hence, only school years 2016/17 and 2017/18 are featured in the subsequent analyses. Data collection was based on questionnaires administered at the beginning and end of the respective school year. Identifiers such as date of birth, class id, gender, email address and the last four digits of their phone number were used to match pre and post surveys for each individual. The final sample contains 2,134 individual students from 167 different secondary school classes. It is important to note that pupils with matched pre/post observations are not systematically different from students who only filled out one of the two questionnaires. Tests for non-random attrition based on personal characteristics, background, and mean levels of the outcome measures pre-treatment demonstrate that attrition did not bias our results. Randomization checks show that despite randomization, pupils in the treatment are more likely to have a first-generation immigrant background and parent entrepreneurs. We take these differences into account in our main analyses.

Questionnaire

The questionnaire used in the trial was based on the ASTEE assessment tool (Moberg et al., 2014). The main focus was on entrepreneurial self-efficacy. Four constructs measured pupils' confidence in specific entrepreneurial skills: *Creativity*, *Financial Literacy*, *Resource Marshalling*, and *Managing Ambiguity*. In order to limit any potential jargon bias, the respective questions did not include any references to entrepreneurship or business management. In addition, one *General Entrepreneurial Self-efficacy* measure, which inquired whether pupils are confident in their ability to start their own company, was included as well as measures of *Entrepreneurial Attitudes* and *Entrepreneurial Intentions*. Each of these constructs was measured by means of three items on a 7-point Likert scale. The Cronbach's α 's range from 0.75 to 0.90, and a factor analysis confirmed that each set of items captures a single unidimensional latent construct.

Several questions on situational factors in students' upbringing were included in the survey to analyze heterogeneous effects of entrepreneurship education. Experiential entrepreneurial background characteristics were captured by two distinct questions. First, students were asked whether one or both of their parents, or grown-ups they live with, had started a company. Second, they were asked to indicate whether they had participated in an activity that aimed at promoting entrepreneurship or self-employment, and specify the main focus of the previous training program. This allowed us to determine whether the previous entrepreneurial learning experience had been "passive" or "experiential". Two separate questions were also included to capture students' social status. These were: (1) whether any of their parents, or grown-ups they live with, have a higher education degree and (2) how they perceive their household income in comparison to other families in the country.

We also included multiple control variables such as gender, mother tongue, extracurricular responsibilities, and self-assessed school performance. Furthermore, depending on the school system, schools or classes were classified into specific types (ordinary, vocational with business focus, vocational with other focus, and technical) to account for level differences

in curricula. Attributing each school to a region based on the *Nomenclature des Unités Territoriales Statistiques* (Nuts 3), allows us to control for disparities in economic wealth and development at a more granular level than mere country-based fixed effects.

RESULTS

Main Effects

A difference-in-differences analysis was used to assess the influence of the program on the participants. We control for the baseline level of the respective dependent variable, school type, and region fixed effects, as well as a variety of student characteristics. The results indicate that participating in the Youth Start program has a generally positive effect on entrepreneurial self-efficacy. Children in the treatment group exhibit a gain in general entrepreneurial self-efficacy of 0.177 ($p < 0.05$). Confidence in financing and managing ambiguity skills rise by 0.157 and 0.153 of a standard deviation respectively ($p < 0.05$), and marshalling resources increases with 0.135 of a standard deviation ($p < 0.10$). The results thus support the hypothesis that participation in a high school entrepreneurship education program leads to greater entrepreneurial self-efficacy.

Heterogeneous Effects

In regards to the differential treatment effect attributed to pupils from entrepreneurial backgrounds, the results suggest that having been involved in experiential entrepreneurship education prior to participation in the Youth Start initiative boosts the learning effect. Students who had at least once been subject to such hands-on activities exhibit an increase of 0.453 of a standard deviation ($p < 0.01$) in entrepreneurial intentions after treatment compared to their peers who had not been exposed to entrepreneurship education before. In addition, general entrepreneurial self-efficacy grows by 0.262 of a standard deviation for these pupils ($p < 0.10$). Additional estimations demonstrate that children whose parents are entrepreneurs do not benefit significantly more or less from the educational intervention. Together these analyses provide tentative evidence for our hypothesis that the Youth Start program differentially affects students with entrepreneurial backgrounds.

Similar estimations were performed with two distinct indicators of socio-economic status. Children with parents of lower educational attainment developed disproportionately higher entrepreneurial intentions (0.143 of a standard deviation ($p < 0.10$)) due to the Youth Start program. It is further interesting to note that these children report to be, on average, significantly less confident in their entrepreneurial skills and generally have lower intentions of becoming an entrepreneur. It thus seems that the program succeeds in bridging the gap in entrepreneurial intentions between students growing up in lower- versus higher-educated families. Non-significant differential effects are found for children from low income families. We conclude that these analyses tentatively suggest that entrepreneurship education initiatives have a more pronounced positive effect on students from less privileged backgrounds.

DISCUSSION AND CONCLUSION

The objective of this study was to provide causal evidence on whether entrepreneurship education programs at the upper secondary school level constitute an effective policy tool to promote entrepreneurial self-efficacy, attitudes and intentions. The results of the randomized controlled trial conducted in Austria, Luxembourg, Portugal, and Slovenia indicate that participation in the Youth Start program has a significant positive impact on general entrepreneurial self-efficacy. Moreover, children develop more confidence in entrepreneurship related cognitive skills (i.e. financing) and non-cognitive skills (i.e. managing ambiguity, marshalling resources) after treatment. The program does not seem to have a significant impact on attitudes towards entrepreneurship or entrepreneurial intentions on average.

The importance of confidence in one's abilities has been repeatedly outlined (Bandura, 1997). A strong sense of self-efficacy enhances personal accomplishment because difficult tasks are perceived as challenges rather than threats. Gielnik, Uy, Funken, & Bischoff (2017) highlight the importance of developing a feeling of mastery and control over an activity for prospective boosts of entrepreneurial passion. Participation in the program can thus foster an open mindset towards new ideas, unconventional problem solving and thinking outside the box: all of which constitute valuable human capital assets for prospective entrepreneurs. In addition, developing self-efficacy through entrepreneurship education might assist students in selecting more deliberately which career path or field of study they want to pursue, thereby paving the way for future entrepreneurial endeavors.

Building on evidence from other domains that disparities in ability are small at birth and expand gradually over time (Fryer, 2011), heterogeneous treatment effects were estimated for a variety of entrepreneurial background and socio-economic characteristics. The aim of this approach was to identify whether differences in childhood environment and socialization influence the effectiveness of entrepreneurship education. We find that children who had been exposed to prior experiential entrepreneurship education exhibit significantly higher intentions of becoming an entrepreneur and higher levels of general entrepreneurial self-efficacy after treatment compared to their peers. This finding supports the notion that the cumulative impact of repeated exposure to entrepreneurship education is important and that early skill development increases the productivity of later skill investments (Cunha & Heckman, 2007). Arguably, children with prior hands-on entrepreneurial experience may be better able to utilize the knowledge and resources provided by the educational intervention (Lyons & Zhang, 2018).

In line with recent work by Lyons & Zhang (2017) we further provide tentative evidence that children with a lower socio-economic status develop higher intentions of pursuing an entrepreneurial career as a result of the program. Our findings suggest that fostering an entrepreneurial culture through educational interventions may represent an effective policy tool to overcome regional disparities by closing the gap on entrepreneurial intentions. Experiential learning experiences such as the challenges implemented as part of the Youth Start program may be particularly well-suited to encourage socio-economically challenged students to engage in entrepreneurship, since these tasks emphasize the importance of diverse forms of talent and draw on children's individual interests and motivation (Jones & Iredale, 2010; Moberg, 2014).

1. Youth Start was part of the co-funded Erasmus+ Programme of the European Union. Project name: USTART Youth Start Entrepreneurial Challenges 388460-EPP-1-2014-2-PT-EPPKA3-PI-POLICY. Further information on the program is available online at www.youthstartproject.eu.

REFERENCES AVAILABLE FROM THE AUTHORS