



The effect of early entrepreneurship education: Evidence from a field experiment



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ABSTRACT

The aim of this study is to analyze the effectiveness of *early* entrepreneurship education. To this end, we conduct a randomized field experiment to evaluate a leading entrepreneurship education program that is taught worldwide in the final grade of primary school. We focus on pupils' development of entrepreneurship knowledge and a set of non-cognitive skills relevant for entrepreneurial activity. The results indicate that knowledge is unaffected by the program. However, the program has a robust positive effect on non-cognitive entrepreneurial skills. This is surprising since previous evaluations found zero or negative effects. Because these earlier studies all pertain to entrepreneurship education for adolescents, our result tentatively suggests that non-cognitive entrepreneurial skills are best developed at an early age. As the entrepreneurship program has various features besides its entrepreneurship content, we must leave it to future research to determine which specific element has the greatest impact on the development of non-cognitive entrepreneurial skills.

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1. Introduction

Can entrepreneurship be taught? This question has been the subject of discussion for many years (e.g., Lindquist et al., 2014; Colombier and Masclot, 2008). The sharp increase in the number of entrepreneurship education programs suggests that the general consensus is that entrepreneurship can indeed be taught. From a policy perspective this is an appealing thought. The idea that entrepreneurs are not necessarily born but can also be developed creates a window of opportunity for (educational) policies aimed at enhancing entrepreneurship. However, there is little research on the effectiveness of such educational programs.

In this study we evaluate the effectiveness of an early entrepreneurship education program. A theoretical motivation to look at *early* entrepreneurship education is provided by Cunha and Heckman's (2007) general model of the technology of skill formation. This model emphasizes the importance of early investments in both cognitive and non-cognitive skills. It strongly suggests that an investment in skills not only has a direct impact on the current stock of skills but also produces spill-over effects in subsequent periods by boosting current skills and by making investments later in life more productive.¹ Early investments in skills may thus be particularly effective in the long run.

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¹ Estimating the model using the Children of the National Longitudinal Survey of Youth from 1979, Cunha and Heckman (2008) and Cunha et al. (2010) indeed find evidence for these dynamic spill-over effects.

Obviously, the (potential) future spill-over benefits of early investments in skills only occur if the early investment has an immediate impact on the stock of skills in the first place. In this paper we therefore evaluate the *direct* (short term) effect of early entrepreneurship education. We report the results from a randomized field experiment using *BizWorld*, one of the leading, internationally renowned entrepreneurship education programs for primary schools.² *BizWorld* aims to teach children aged 11 or 12 the basics of business and entrepreneurship and to promote teamwork and leadership in the classroom through an experiential learning program that takes 5 days (within a time span of 2–4 weeks). Based on the mission of *BizWorld* and entrepreneurship education policies more generally, we measure the effect of the program on the development of entrepreneurship knowledge, non-cognitive entrepreneurial skills and entrepreneurial intentions. The sample consists of 63 different primary schools (118 classes, 2751 pupils) in the western part of the Netherlands that voluntarily signed up for the *BizWorld* program in 2010 and/or 2011. We were able to randomly assign these schools and classes to either the treatment or the control group. In both treatment and control a pre-test–post-test design was used, allowing for an (unbiased) difference-in-differences estimate of the net treatment effect.

This paper's contribution is due to three main characteristics of the study. First, to the best of our knowledge, this is the only study to evaluate the effects of entrepreneurship education on children in primary school (ages 11 and 12). Previous studies of the impact of youth entrepreneurship education follow adolescents. Second, unlike previous studies, we study the development of both knowledge and skills. Finally, we are able to estimate the unbiased (short term) effect of early entrepreneurship education on knowledge and skill development by conducting a randomized field experiment.

To evaluate the effect of the *BizWorld* program we selected nine non-cognitive skills from the literature that are known to be associated with entrepreneurial choice and/or success.³ The results indicate that the program has a significantly positive effect on these non-cognitive entrepreneurial skills. On average, the skill levels in the treatment group increase to a larger extent than in the control group for all nine skills tested. The results are significant for seven skills. Self-reported scores on (constructs of) *Risk taking propensity*, *Creativity*, *Need for Achievement*, *Self-Efficacy*, *Pro-activity*, *Persistence* and *Analyzing* all increase significantly more in the treatment group than in the control group. These non-cognitive skills are not only relevant within an entrepreneurial context. There is an emerging body of research that emphasizes the importance of non-cognitive skills in predicting future labor market outcomes (Heckman et al., 2006; Cunha and Heckman, 2008; Heckman et al., 2013). For example, in the Perry Pre-school program it was not an increased IQ but rather the increase in non-cognitive skills that caused the difference in labor market outcomes between the treatment and the control group years later (Heckman, 2006). Moreover, the improvements in labor market outcomes reported by Chetty et al. (2011) as a result of the project STAR were caused by improvements in personality skills and behavior, rather than by increased test scores. Hence, entrepreneurship education could not only be beneficial to enhance successful entrepreneurship, but also to positively affect labor market outcomes in general. We find that the program is less effective in developing entrepreneurship knowledge. That is, there is no significant impact of the program on this outcome. Furthermore, the results indicate that, if anything, the program has a negative effect on the entrepreneurial intentions of children.

We note that the results reported here reflect the total treatment effect. Possibly, these effects of the program are not (entirely) related to the entrepreneurship component of the program. The fact that children work together in a team in a competitive environment is quite different from the regular school setting. We provide some descriptive evidence that part of the treatment effect could be driven by the teamwork component of the program. However, due to the current set-up of our field experiment we are unable to investigate the effects of the different components of the program separately.

The findings presented above, especially on non-cognitive skill development, are quite different from the mixed results found in the impact evaluation studies conducted so far (e.g. Peterman and Kennedy, 2003; Souitaris et al., 2007; Oosterbeek et al., 2010; von Graevenitz et al., 2010). All of these studies measure the effectiveness of entrepreneurship programs aimed at adolescents in secondary or higher education and most of them focus on the impact on entrepreneurial intentions only. Some studies find positive effects on entrepreneurial intentions (Peterman and Kennedy, 2003; Souitaris et al., 2007), while others find no or even a negative effect (Oosterbeek et al., 2010; von Graevenitz et al., 2010). Part of the explanation for the mixed findings might be that the two studies finding a positive effect are based on non-random assignment; self-selection may then lead to an upwardly biased estimate of the program's impact. Only Oosterbeek et al. (2010) measure the impact on the development of entrepreneurial skills, besides intentions. They find insignificant effects for a student mini-company program that is part of the international 'Young Enterprise' program offered by the Junior Achievement Worldwide network.⁴

Compared to the results found by Oosterbeek et al. (2010), our results tentatively suggest that it might be more efficient to invest in the development of entrepreneurial skills of children rather than of adolescents. On top of the large immediate

² This paper is part of a larger research project that was carried out within the context of the *BizWorld* education program (see also Huber et al. (2014)).

³ An overview of the skills and their association with entrepreneurial choice and performance will be provided in Section 3.3.

⁴ Recent studies by Karlan and Valdivia (2011) and Fairlie et al. (2012), using randomized experimental designs, report mixed results on the impact of entrepreneurship training for entrepreneurs. Karlan and Valdivia (2011) find positive effects on business knowledge. However, neither of the studies finds an (positive) impact of entrepreneurship training on business outcomes (also see McKenzie and Woodruff, 2014 for an extensive overview of Business Training and Entrepreneurship evaluations).

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