Making Entrepreneurs: Effect of Training Youth in Business Skills on Enterprise and Employment Creation*

Laura Chioda[1], David Contreras-Loya[1], Paul Gertler[1,2], and Dana Carney[1]

[1]University of California, Berkeley
[2]NBER

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Abstract

We study the medium-term impacts of the Skills for Effective Entrepreneurship Development (SEED) program, an innovative in-residence 3-week mini-MBA program for high school students modeled after western business school curricula and adapted to the Ugandan context. The program featured two separate treatments: the hard-skills MBA features a mix of approximately 75% hard skills and 25% soft skills; the soft skills curriculum has the reverse mix. Using data on 4,400 youth from a nationally representative sample in a 3-arm field experiment in Uganda, the 3.5 year follow-up demonstrated that training was effective in improving both hard and soft skills, but only soft skills were directly linked to improvements in self-efficacy, persuasion, and negotiation. Youth in both groups were more likely to start enterprises and more successful in ensuring their businesses' survival. The program led to significantly larger profits (27.8% and 34.8% for hard- and soft- treatment arms respectively) and larger business capital investments (72.5% and 58.8% for SEED hard and SEED soft, respectively). Relative to the control group, SEED entrepreneurs created 550 new businesses and 985 additional jobs. The individual's skill upgrade was rewarded by substantially higher earnings; 38.7% and 21.2% increases in earnings for those who attended hard- and soft-training, respectively, largely generated through self-employment. Both SEED curricula were very cost-effective; one (two) month's worth of extra earnings as a direct consequence of having attended the SEED hard (soft) program would exceed its total cost.

JEL Codes: I20, J01, J02, J23, J24, M13, M53, O15

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1 Introduction

Many commentators have recognized entrepreneurship as a powerful engine of economic growth (e.g., Smith (1776)). Entrepreneurs make investments in risky ventures in hopes of high returns, introduce new innovative goods and services, and improve production processes (e.g., Schumpeter, 1911). Accordingly, governments have invested heavily in educational programs to increase their "stock" of entrepreneurial skills (Deming, 2017; OECD, 2015); They spend more than US$ 1 billion annually on entrepreneurship training (McKenzie et al., 2020).

Unlocking the "production function" of high-quality entrepreneurs is pivotal to addressing numerous development challenges. Small and medium enterprises (SMEs) account for the majority of businesses worldwide and are important contributors to job creation and global economic development. SMEs represent about 90% of businesses and account for more than 50% of employment worldwide. Formal SMEs generate most formal jobs, and contribute up to 40% of national income in emerging economies (World Bank).[1] SMEs form the backbone of the African economy, representing more than 90% of businesses and employing about 60%-70% of workers, many of whom are women and youth (International Trade Centre, 2018). The World Economic Forum estimates that Africa's workforce will increase by a staggering 910 million people by 2050, of which 830 million will be in Sub-Saharan Africa, creating enormous pressure for jobs on SMEs, which typically account for approximately 80% of new jobs. The stakes to produce high quality entrepreneurs are even higher considering that the overwhelming majority of business owners are entrepreneurs who lack alternative opportunities (Schoar, 2010).

To assess the extent to which successful entrepreneurs can be "made" or trained, we designed and implemented an at-scale intervention called Skills for Effective Entrepreneurship Development (SEED) in Uganda. SEED is an innovative, full time, in-residence 3-week mini-MBA program modeled after western business school curricula, adapted to the Ugandan context.

SEED targets youth at the end of secondary school, which is earlier in life than traditional entrepreneurial training interventions and before youth begin their working lives—an age group not yet extensively studied for this type of intervention. This phase represents a unique opportunity to shape their futures and set them on higher trajectories of lifetime productivity. During adolescence until early to mid 20s high-level executive and social processes needed for emotion regulation, working memory, inhibitory control, abstract thought, decision making, perspective taking, and interpersonal communication undergo substantial development (e.g., Blakemore and Robbins, 2012; Dumontheil, 2014; Sebastian et al., 2010; Andrews et al., 2021; Choudhury et al., 2006).[2]

SEED was designed to generate transformational entrepreneurial skills. Recent evidence (Schoar, 2010) suggests that transformational and subsistence entrepreneurs are quite different: not only in terms of their economic objectives, but also with respect to ability, motivation, and person-

[1] The figure is significantly higher if informal SMEs are included.

[2] Development of these cognitive processes appears to be underpinned by structural and functional brain plasticity. During adolescence until young adulthood, the prefrontal cortex undergoes significant structural changes that entail the proliferation of new synapses and rewiring of existing connections particularly between prefrontal and limbic regions (Ahmed et al., 2015; Blakemore, 2012).

ality characteristics. Transformational entrepreneurs tend to have higher ability (de Mel et al., 2013), stronger confidence/ambition/motivation, and higher expectations for their own business, enterprise self-efficacy (Ardagna and Lusardi, 2010). A number of other studies have emphasized the role of various intra- and inter-personal skills in entrepreneurial success (Lucas, 1978; Baumol, 1996; Murphy et al., 1991; Gennaioli et al., 2013; Levine and Rubinstein, 2017).[3]

SEED featured two separate treatments arms. The hard skills SEED placed a stronger emphasis on hard skills: 75% hard skills (e.g., accounting, finance, economics, marketing, etc.) and 25% soft skills (e.g., such as negotiation, persuasion, grit, emotional regulation, etc.). The second treatment arm, soft skills SEED, had the reverse mix: 25% hard skills and 75% soft skills. In 2012, a sample of 4,400 high school students were recruited from a random sample of 200 high schools from the universe of full-time high schools in Uganda. Study participants were then randomly assigned to one of the two treatments or to a control group.

Immediately following the intervention, both curricula yielded significant differential accrual of hard and soft skills knowledge consistent their specialized focus, thereby validating the intent of the training. During the 3.5 year follow-up, SEED graduates still outperform their counterparts in the control group in terms of hard skills and business knowledge, as well as in socio-emotional skills/traits. While test scores of hard skills knowledge for the two treatment groups converged, the treatment effects on inter- and intra-personal skills tell a more nuanced story. The differential between hard and soft skill treatments disappeared for *intra-personal skills* (Stability, Plasticity, Stress, etc.), while a meaningful difference persisted for *inter-personal skills* (Negation and Persuasion) and Self-Efficacy (defined as the belief about one's ability to effectively perform tasks, including interpersonal tasks, needed to achieve a valued goal), favoring the SEED soft treatment.

To put the results that follow into perspective, it is worth noting that the medium term effects provide insight on a nationally representative sample of young adults (34% female) in their mid-twenties. 3.5 years post-high school and post-intervention, 72% of the sample was either self-employed or working for someone else, with nearly 90% of the earnings generated by self-employment. Study participants accounted for 3,369 businesses created over the course of 3.5 years. We collected detailed economic data on over 1,665 young enterprises (34.7% of which are formal) that were operating at endline. These enterprises were responsible for creating over 6,500 jobs (6,657 employees including the owners), corresponding to approximately 3.93 employees per business.

Against this backdrop, our main results indicate that SEED was effective not only at jump-starting youth human capital (soft and hard skills) accumulation, but also at setting them on higher earnings trajectories and expanding their income opportunities. Youth in both training groups are more economically active (SEED Hard: 9.8%; SEED Soft: 7.1%) and earn more (SEED Hard: 38.7%; SEED Soft: 21.2%) than the control group, with these differences being largely driven by higher degrees of entrepreneurship. SEED graduates are more likely to start businesses (SEED

[3]These same skills have been shown to also be important in the context of more general labor market outcomes. See for instance, Borghans et al. (2014); Deming (2017); Deming and Kahn (2018); Heckman et al. (2006); Bowles et al. (2001); Autor (2015).

Hard: 10.5 pp; SEED Soft: 11.1 pp relative to the control group) that survive over time. Moreover, the program contributed to the creation of vibrant and more profitable ventures (SEED Hard: 27.8%; SEED Soft: 34.8% higher profits than the control group), with SEED graduates behaving more like *transformational/opportunity entrepreneurs* (as in Schoar, 2010). They were more successful in seeding dynamic businesses that grow beyond an individual's subsistence needs, leading to expanded employment opportunities for others (985 additional jobs and 550 new businesses), and attracting larger capital investments (SEED Hard: 72.5%; SEED Soft: 58.8%). Both SEED curricula were highly cost-effective and compare favorably to existing training alternatives: one (two) month's worth of extra earnings (relative to the control group) alone would exceed the cost of the hard (soft) intervention ($118 per participant). These benefits abstract from the job- and business-creation benefits of the program, which were substantial.

Our work stands in contrast to the large body of work has studied the effectiveness of business-training courses in improving the performance of managers of existing enterprises. Despite their popularity, the evidence base for training programs has been disappointing. The reviews of Blattman and Ralston (2015), McKenzie and Woodruff (2017), and Card et al. (2018) document relatively weak or temporary impacts of training programs in low-income settings. A more recent meta-analysis (McKenzie, 2020) concludes that traditional entrepreneurship training has modest but (across studies) significant effects in terms of improving business practices and business outcomes for microenterprises. The most compelling evidence relates to the training of small-scale subsistence enterprises: successful training interventions may lead to short-lived improvements in profits or sales, without altering the growth paths of enterprises.

Fewer resources have been devoted to assessing whether individuals can be taught a more entrepreneurial personality (Kerr et al., 2017). A small but growing number of attempts have been made to evaluate interventions that teach such attributes to entrepreneurs in developing countries. Programs that foster an entrepreneurial mindset have shown more encouraging results than traditional training. Innovations include personal initiative training (see Campos et al., 2017; Alibhai et al., 2019; Ubfal et al., 2019, in Togo, Ethiopia, and Jamaica, respectively) and psychology-influenced training curricula, including interpersonal skills (Dammert and Nansamba, 2019). Efforts to follow up on Campos et al. (2017)'s success in Togo – where training personal initiative increased firm profits by 30%, compared to a statistically insignificant 11% increase among those who received traditional training– yielded largely insignificant and therefore less encouraging results in other contexts.

Our work also contributes to a broad literature that underscores the importance of youth interventions and their potential to endow youth with critical intra- and inter-personal skills. This critical developmental phase has garnered increasing attention (Kautz et al., 2014). Programs targeting the development of youth's socio-emotional skills have led to improvements in education outcomes (Yeager et al., 2019; Alan and Ertac, 2018; Alan et al., 2019) and have shown promise as effective prevention strategies against crime and antisocial behavior (Blattman et al., 2017; Heller et al., 2017).

Recent work has also highlighted the role of negotiation and persuasion skills – skills that are at the center of the SEED intervention – in shaping education outcomes and gender attitudes of adolescent girls. In Zambia, Ashraf et al. (2020) finds that negotiation training (which taught girls skills to reconcile different interests by looking for "win-win" solutions) led to improvements in human capital outcomes 3 years after the intervention. In India, Dhar, Jain and Jayachandran (2020) document meaningful impacts on gender attitudes of a school-based *persuasion* intervention for adolescents among the sample of both boys and girls two years after training. No labor market outcomes were reported by either study.

This paper also relates to Bandiera et al. (2020) and Alfonsi et al. (2020) because of their focus on youth and on labor market outcomes, although these studies place less emphasis on socio-emotional skills. Bandiera et al. (2020) assess the impact of a program that provides adolescent girls with an opportunity to simultaneously acquire (i) *vocational skills* to enable them start small-scale income-generating activities and (2) life skills to help them make informed choices about sex, reproduction, and marriage. Four years post-intervention, adolescent girls in treated communities are more likely to be self-employed and to delay family formation. Alfonsi et al. (2020) design a labor market field experiment to compare demand-side (vocational training, VT) and supply-side policies (offering firms wage subsidies to train workers on-the-job, FT) to tackle youth (approximately 20 years old) unemployment. Their results speak to the importance of portability and transferability of skills. Indeed, both treatments led to skill accumulation, VT workers learn sector-specific skills, FT workers learn more firm-specific skills, which translates into differential gains in employment rates (VT: 21% vs FT: 14%) and increases in total earnings (VT: 34% vs FT: 20%).

The paper is organized as follows. Section 2 details the intervention and its implementation. Section 3 describes the research design. Section 4 presents the experimental design, data and estimation strategy. Section 5 presents the impacts of the hard and soft skill treatments on post-intervention knowledge assessments and on various outcomes in the medium run (3.5 years). It also undertakes a cost-benefit analysis. Section 6 concludes by highlighting the broader implications of our findings for policies and future research.

2 The Intervention

The study team designed two separate curricula: a hard skills-focused mini-MBA and a soft skills-focused mini-MBA. The hard skills curriculum is approximately 75% hard and 25% soft skills and the soft skills curriculum is the reverse mix. Both are intensive 3-week long entrepreneurship courses. An outline of the lesson plan for the two curricula is summarized in Table 1.

Students in the **hard skills program** differentially focus on (1) accounting, covering financial statements (income statements and balance sheets) and the cost structure of an enterprise, (2) business creation covering generating business ideas, selecting a suitable market, resources needed to start an enterprise, and legal forms of business ownership (3) management, covering sales, keeping track of business operations, hiring and managing people, and selecting suppliers; and (4) finance,

Table 1: Lesson Plans for Soft and Hard Curricula

SEED CURRICULA: OVERVIEW OF LESSONS		
HARD SKILLS	**SOFT SKILLS**	**BUSINESS PLAN**
1. Defining Entrepreneurship	1. Defining Entrepreneurship	1.Entrepreneurship in Society
2. Self- Employment	2. Entrepreneurial Identity	2. Thinking About Business
3. Generating Business Ideas	3. Self-Management	3. Evaluating Starting an Enterprise
4. Identifying Business Opportunities	4. Identifying Business Opportunities	4. Business Planning Overview
5. Selecting a Suitable Market	5. Communication	5. Skills/Resources needed
6. Ways of Getting into Business	6. Win-Win Judgment	6. Market Research
7. Legal Forms of Business Ownership	7. Personal Power	7. Coffee Shop Case Study, part 1
8. Hiring and Managing People	8. Negotiation Simulation	8. Taxes & Legal Responsibilities
9. Knowing the Cost of an Enterprise	9. Leadership and Team Building	9. Coffee Shop Case Study, part 2
10. Money Needed to Start an Enterprise	10. Goal setting	10. Financial Planning
11. Obtaining Money to Start an Enterprise	11. Decision Making Skills	11. Fundraising
12. Managing Money	12. Group Decision Making	12. Marketing
13. Investment Simulation	13. Risk- Taking	13. Confidence & Executive Summary
14. Using Financial Statements	14. Social Networking	14. Persuasion & Business Plan Pitch
15. Managing Sales	15. Public Speaking	15. Pitching your Business Plan
16. Selecting Suppliers	16. Formal Presentations Business Plan	
17. Using Technology in Small Business	17. Using Technology in Small Business	

covering managing money, investments, and obtaining financing to start a business. This hard-skills curriculum provides foundational skills so that the students know how to generate a business idea, how to secure capital, how to get the business off the ground, and how to manage it.

Students in the **soft skills program** differentially focus on inter- and intrapersonal skills. Specific topics include (1) learning to control one's self through self-management, goal setting, risk taking, decision making and personal power;[4] (2) persuasion through communication strategies, leadership and team building, group decision making strategies, social networking and public speaking, (3) negotiation through win-win strategies and personal power. This soft skills curriculum provided foundational skills so that students have more self-awareness, better ability to regulate emotions, delay gratification, and make sound decisions.

The **business plan curriculum** provided to both groups was designed to provide the elements of a business plan that students could use as a guide to develop successful business plans. Students were first provided with the goals, structure and elements of a business plan. The course then went into depth on key elements including market research, human resources, legal and tax issues, financial planning, fund raising, and marketing. Two classes were devoted to pitching the business plan and two others to case studies. The business plan curriculum was designed to guide students in writing their own original business plan, with the author of the winning business plan at each host school winning a cash prize of 1 million Ugandan Shillings, UGX ($400). One student per site

[4]personal power is the ability to ignore the influence of others, to control one's own outcomes, and to be personally independent (van Dijke and Poppe, 2006; Galinsky et al., 2008).

won, for a total of 10 winners.

The curricula were designed to enable highly participatory classroom environments, addressing different modalities of learning through a variety of exercises and teaching methods. The soft skills curriculum was based on a social entrepreneurship curriculum developed and used by *Educate!*, an NGO that delivers social entrepreneurship training and mentorship to Ugandan secondary school students.[5] The hard skills curriculum was mainly based on the Know About Business curriculum developed and used by the International Labor Organization in Africa. Both soft and hard skills curricula integrated content from the MBA program of the Haas School of Business at UC Berkeley. The curricula were extensively pilot tested to ground them in the local language and conceptual environment, to make them relevant and salient to local business institutions, and to ensure that course content was appropriate and well-understood, and that the teaching methods were interesting and engaging.

Each of the curricula were broken down into 17 sessions and detailed lesson plans were developed for each session (see Table 1). Lesson plans included detailed steps for the teacher to follow, framed by objectives and rationale to encourage a sense of ownership by the teacher. The plans covered learning objectives, key concepts, case applications, presentation materials and a series of interactive exercises. The lesson plans were designed for use in an intense Western-Socratic based course in which the learning process encourages sharing, discovery and reflection while maintaining a similar classroom environment between curricula and across all training sites.[6]

The training took place between May 6th and May 24th, 2013 – for a total of 17 instruction days – at 20 host school training sites. Training took place during the break between Term 1 and Term 2 of the academic year, when dormitories at host schools would be empty. Students slept and boarded at the schools, attending two lessons each day: one hard or soft skills lesson in the morning and one business plan lesson in the afternoon. Each student also had two "prep" periods a day; one in the morning and one in the afternoon. Students were expected to work on homework or on their business plans during these periods, which were supervised by SEED camp directors and teachers.

The study used a number of different types of monitoring and supervision to assess both operational and academic aspects of the training and to ensure that the training was implemented as designed. The monitoring was used to identify deviations from the curriculum and weak instructional pedagogy by specific teachers and correct problems in real time.

[5] Educate! tackles youth unemployment by partnering with youth, schools and governments to design and deliver solutions that equip young people in Africa with the needed skills. Educate! advises national governments (Uganda, Kenya, Rwanda) on curriculum design and teacher training initiatives. Educate! was recognized by the World Bank (S4YE) and the UN, received the 2015 WISE award and the 2018 Klaus J. Jacobs Prize.

[6] Finally, there was also a series of planned social activities that were implemented consistently across all training sites. These took place nearly every evening and included debates, a cultural night (in which students representing different cultures rehearsed and performed dances), movie nights, a spelling bee, a lip-syncing competition ("miming"), stand-up comedy, quiz nights, and a social dance. In addition, sports activities took place each afternoon before dinner. Basic sports equipment (volleyballs, netballs, and soccer balls) was purchased for each school.

3 Experimental Design

The study is designed to be nationally representative, with both students and teachers randomly assigned to one of three arms (hard skills, soft skills and control) and to one of 20 training sites. The design of the field experiment is summarized in Figure 1.

3.1 Student Recruitment

To ensure representativeness at the national level, students were recruited from 200 full-time secondary schools randomly selected from the universe of Uganda's approximately 700 full-time secondary schools. In October of 2012, promoters went to each of the 200 schools to recruit students in their sixth (last) year of secondary school. Each recruiting visit consisted of an oral presentation and promotional posters. The promotion informed the students of a 3-week in-residence program designed to train students in entrepreneurship skills. SEED would be free, including lectures, room and board, and transport, and students would have the chance to write business plans and enter a competition for a large cash prize. The promoters explained that there was limited space in the program, such that not all applicants would be admitted, but that they all have an equal chance of admission through a fair lottery.

Students interested in the program were asked to fill out both a simple application form and a baseline survey.[7] Response to the SEED program opportunity was overwhelmingly positive. In almost all schools, the majority of the S6 class expressed interest in the program which resulted in 8,080 students application. However, 313 (3.9%) were dropped due to problems with their student ID, 113 (1.3%) because the student failed to indicate their gender, and another 223 were dropped because they were already participating in another entrepreneurship training program. The remaining 7,431 served as our population universe for the study.

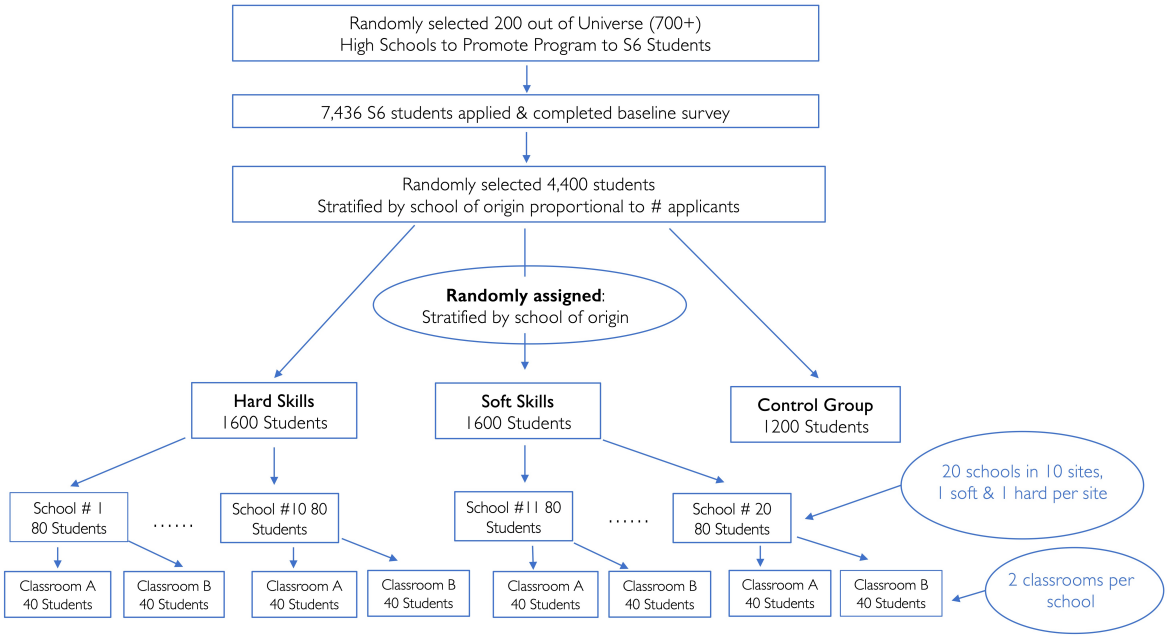
3.2 Student Assignment to Treatment Arms and Training Sites

Power calculations indicated that we needed 1,200 students in each arm (hard skills treatment, soft skills treatment, and control group), or 30 students in each of the 80 classes. Taking into account estimates of attrition rates from similar programs and the long period of time between recruitment and program implementation, the evaluation team over-enrolled each treatment arm by one third, accepting approximately 1,600 students in each arm, or 40 students per class. The control group remained at about 1,200 students. Therefore, we randomly sampled 4,400 students from the 7,436 eligible applicant pool to participate in the study, randomly assigning 1,600 to each treatment group and 1,200 to the control group, stratified by school and gender.

In order to minimize travel time, recruitment schools were clustered into four geographic regions, with students participating in the study being sent to a randomly selected school in their region.

[7] The application form asked students to provide detailed contact information. It also included the question: "If you participate in the SEED training, what business would you start and how would you start and run it?" This question was included to indicate to students that SEED would accept serious applicants who have given some thought to the idea of starting their own businesses.

Figure 1: Experimental Design



Of the 200 schools visited during data collection and recruitment, 20 eventually served as training sites. The distribution of training sites was chosen based on the number of individuals in the sample surveyed in each region in order to achieve fairly even numbers across regions. Roughly 40% of the sample attended schools in the West, 40% from the East (including 20% in the Jinja area and 20% in the Mbale area), and 20% from the North. As a result, eight sites were located in the West, eight in the East, and four in the North for a total of 20 training sites.

The 20 schools were divided into 10 sites that included one hard skills only school and one soft skill only school. Each school had two classrooms for a total of 40 classrooms, 20 in each arm of the study. Students assigned to the hard skills arm were randomly assigned to one of the hard skills classrooms within their region, stratified by feeder school and gender. Similarly, students assigned to the soft skill arm were randomly assigned to one of the soft skills sites within their region, stratified by feeder school and gender. Roughly 160 students were assigned to each site, 80 per school and were divided into two classes of 40 each.

3.3 Teachers Training and Assignment

Each school was staffed with three teachers: two regular curriculum instructors (hard or soft skills), who both teach the regular curriculum and one instructor who teaches the business plan curriculum exclusively. Teachers were randomly assigned to one of the training site and to a classroom stratified by language ability.

The research team worked with *Educate!* to recruit, hire, and train instructors in general

teaching methods. Trainees were required to pay a fee of (approximately) $134 to enroll in the training and, upon completion, were issued a formal certificate, which is highly valued in Uganda as it is perceived as strong signal of quality.

Potential instructors were first trained in general (western) teaching methods. Instruction took place five mornings per week for four weeks. Recruits who met the training requirements were then randomly assigned to one of three groups: (1) hard skills, (2) soft skills, and (3) business plan. The second training phase, lasting three weeks, focused exclusively on their assigned topic (hard, soft or business plan). The training was designed to establish three levels of learning – the "what", the "how", and the "why" of each lesson – including insight into the rationale for the content, thereby endowing teachers with a deep understanding as well as a sense of ownership over the material. Teachers received hands-on practice with their assigned lessons via read-through assemblies, mock lesson presentations and role playing. After the specialized training, the curriculum development consultants provided an additional day of coaching to several teachers who were identified as being relatively weak based on a consensus among trainers. All teachers had to pass a knowledge test satisfactorily (the same that was administered to students) in order to become SEED instructors.

4 Data, Attrition, and Compliance

A **baseline survey** was administered to all study participants at the time of recruitment and prior to assignment to the study arm. The survey was framed as purely research-oriented and with no bearing on a student's chances of being accepted. The 45 minutes survey collected a rich set of baseline characteristics: demographic and family background as well as participants' education, ability and intelligence proxies, job experience, personality traits and soft-skills.

Table A.1 reports summary statistics for study participants as well as the results of balance tests between intervention groups.

At baseline, youth were on average 20 years old, 34% female, with 73% attending a boarding school and 70% planning on attending university. Study participants became active in the labor market at an early age (14.5 years old on average) and, by the time, they reached their last year of secondary school, approximately 40% owned a small business. The majority of youth's parents had not completed secondary education (60% of fathers and 73% of mothers) and tended largely to be employed in low skill, manual jobs. As alluded to in the introduction, in low income countries nearly half of the labor force runs an enterprise, consistent with our sample (51% of households owned a business).

Randomization achieved good balance across groups, with p-values associated to joint tests of whether the 30 covariates predict treatment statuses relative to the control exceeding 0.16. We test for balance across 30 outcomes, such that some individual coefficients are expected to be significant by chance. Few systematic differences (only 5 out of 90 comparisons) are observed, and were quantitatively small.

Skills knowledge assessments were carried out before and at the end of the training. These

include an extensive array of concepts at the core of the two curricula.[8] The skills assessment was administered in order to establish whether the two treatment arms endow youth in the hard and soft skills training with different sets of skills that reflect the intensity of the assigned treatment arm. As discussed later, both treatments did improve knowledge of hard and soft skills, but youth in the hard skills arm accrued larger gains in terms of hard skills knowledge relative to those who attended the soft skills arm; the gain in terms of soft skills were reversed.

In the context of the **3.5 year follow-up survey**, we collected an extensive set of outcomes that can be organized into four groups: (1) SES and demographic outcomes (e.g., education, self-assessed present and future social standing and wealth standings, time use); (2) labor market indicators (e.g., labor force participation, entrepreneurial success, wage and self-employment earnings, business investment, access to lending); (3) business knowledge and business/management practices; (4) self-reported and task-based measures of soft skills (e.g., negotiation, persuasion, patience, self-efficacy, stress, grit, and Big Five).

Three and a half years after the intervention, 88.4% of the original sample was successfully tracked. However, the attrition rates were slightly higher for the control group than for the two treatment groups. Recontact rates were 85.3%, 89.7% and 89.3% for the control, hard-skills and soft-skills groups, respectively (see Table A.3, column (1)). Female and marginally older youth tend to attrit at higher rates, while youth planning on attending university tend to attrit less. However, covariates do not appear to explain attrition rates across assignment groups (see Table A.3, column (2)), with the coefficients on the two treatment dummies being virtually unchanged (nor are their standard errors) from column (1) to column (2). In other words, differential attrition across groups is not explained by our rich set of observables, including proxies for abilities, personality traits, and socio-emotional characteristics.

In order to assess whether differential attrition leads to bias, we retest balance across all of our 30 outcomes for the estimation sample used in our ITT analysis (Table A.4): only 9 out of 90 comparisons are significantly different from zero; the p-values for joint tests of whether the 30 covariates predict treatment statuses relative to the control are larger than 0.37, consistent with the notion that the samples remain well-balanced on various youth characteristics 3.5 years post-intervention.

Finally, Tables A.5 and A.6 document imperfect compliance with assignment among the two treatment groups, but no contamination of the control group (no defiers). 69% of those assigned to treatment (SEED hard: 67.8%; SEED soft: 69.8%) participated in SEED. Conditional on taking up treatment, the majority (over 75%) attended 28 or more of the 30 sessions. These take-up rates

[8] Topics covered by the *hard skills test* include general business knowledge (e.g., meaning of an enterprise, definition of legal ownership, challenges and advantages of self-employment); concepts related to industry sectors, market competition and its implications; best business practices surrounding sales, marketing, employee management; elements of profit/loss statements, utility of records keeping, classification of costs; financing strategies to support capital and business investments; elements of successful business plans; and strategies to identify and develop good business ideas. *The soft skills assessment* instead focused on qualities and traits of successful entrepreneurs; communication, the importance of listening, elements of successful public speaking; negotiation strategies and desirable outcomes; attributes of win-win judgement; personal power (self-mastery, competence, vision, confidence); decision-making skills; and the importance of teams and social networking.

are consistent with other entrepreneurship training programs analyzed in the literature, such as Groh et al. (2015), de Mel et al. (2013) and Calderon et al. (2020), and exceed the 21% take-up rate in Bandiera et al. (2020).

4.1 Estimation

Identification of program impacts relies on random assignment of applicants to SEED curricula and control groups. For parsimony and for cleaner interpretation of the results, we present intent-to-treat (ITT) estimates, which capture the impact of offering SEED training irrespective of actual take-up.[9] Our main estimating equation for the ITTs is given by

$$y_i = \alpha + \beta_h T_i^h + \beta_s T_i^s + \gamma \mathbf{X}_i + \epsilon_i \tag{1}$$

where y_i denotes outcome y for youth i; T_i^h and T_i^s correspond to hard skills and soft skills treatment indicators, respectively; β_h and β_s represent the ITT for the respective treatment arms; $\mathbf{X}_i$ is a vector of controls. In the paper, we report estimates for which the controls are chosen using Double/Debiased Machine Learning, DML (Chernozhukov et al., 2018) to maximize precision.[10] DML ITTs and standard errors are estimated using an interactive model in which treatment dummies are not additively separable.[11]

When considering multiple hypothesis tests simultaneously, standard statistical techniques will lead to over-rejection of null hypotheses unless the multiplicity of the testing framework is explicitly considered. We adopt Romano and Wolf (2005)'s correction, which controls the familywise error rate (FWER) by taking into account the dependence structure of the test statistics. For a given family of k conceptually similar blocks of outcomes, the algorithm uses resampling and step-down methods to estimate the dependence structure of the test statistics and provides corrected p-values.

5 Results

This section organizes outcomes into categories related to their causal distance from the training: the theory of change posits that the program impacts youth's skill sets and that these skills, in turn, shape labor market outcomes and, ultimately, youth's livelihoods. We first assess the effect of the training on knowledge of hard and soft skills immediately after the training and 3.5 years after the intervention. During our follow-up, in addition to hard skills and business knowledge, we also

[9] Local Average Treatment Effect, LATE, estimates of the effect of treatment on the treated using initial random assignment as an instrument are proportional to ITT estimates under a monotonicity assumption (no defiers). That is, $LATE = ITT/\pi_c$, where π_c is the fraction of compliers.

[10] The main results and overall conclusions are preserved when we omit baseline controls, $\mathbf{X}_i$; however, as expected, DML improves precision.

[11] DML estimates rely on K-fold cross-fitting (in our case $K = 5$) to minimize overfitting. In finite samples, the dependence of the estimator on the particular split creates an additional source of variation. Following Chernozhukov et al. (2018), to incorporate a measure of this additional source of variation into estimates and their standard errors, the estimation step is repeated S times ($S = 100$). Sample medians of the estimates and median standard errors obtained across the S replications/splits are reported.

Table 2: Post-training Knowledge Test Scores

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Hard Skills Assessment (sd)				Soft Skills Assessment (sd)			
Soft Skills Treatment								
β	**-0.40*** **	**-0.43*** **	**-0.42*** **	**-0.41*** **	**0.28*** **	**0.25*** **	**0.26*** **	**0.28*** **
se	(0.041)	(0.035)	(0.033)	[0.024]	(0.035)	(0.034)	(0.032)	[0.023]
Mean of Hard Skills	**0.761**				**0.465**			
Observations	1959	1959	1959	1959	1959	1959	1959	1959
Lagged score	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Student characteristics	No	No	Yes	Yes	No	No	Yes	Yes
DML	No	No	No	Yes	No	No	No	Yes

Note: Test scores for the hard and soft skills assessments post intervention are standardized with respect to knowledge assessment test scores performed prior to training. The mean of the hard skills group corresponds to the average test score for youth in the hard skill curriculum. All specifications are OLS regressions, with the exception of columns (4) and (8) where controls are chosen using DML (Chernozhukov et al., 2018).

measure different socio-emotional skills/traits (e.g., Big Five, Stress, Self-Efficacy, etc.) including task-based measures to assess persuasion and negotiation skills. Finally, we present an overview of our economic outcomes: labor force participation and business-related outcomes (e.g., enterprise start-up and survival rate, employment creation, as well as business investment). We conclude by reporting results on earnings to study to which extent upgrades in entrepreneurship mindset and skills are rewarded in the labor market and translate into more profitable enterprises.

5.1 Knowledge Assessments, Post Treatment

Students who attended the training completed tests of hard and soft skills knowledge at the beginning and at the the end of the mini-MBA. The pre- and post-training knowledge assessments are identical, except that the order of questions differs between the tests.

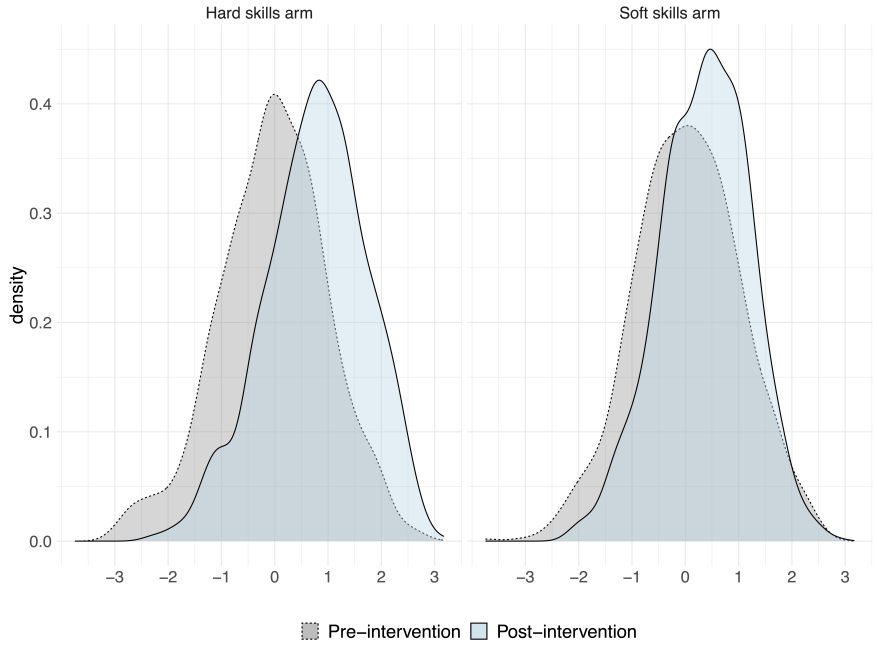
Figure 2 illustrates the pre-to-post shift in the test score distributions for hard and soft skills knowledge, by treatment arm. Aggregate test scores were computed as standardized weighted averages following Anderson (2008).[12] After three weeks of training, both curricula were associated with significant improvements in test scores for hard and soft skills knowledge relative pre-program knowledge.

More importantly, the two curricula led to significant differential knowledge accrual in hard and soft skills knowledge (see Table 2). Focusing on **hard skills knowledge**, youth in the hard and soft skill trainings experienced large knowledge gains, 0.76 sd and 0.36 sd respectively. The hard skill curriculum increased hard skills test scores by 0.4 sd relative to the soft skill group. This learning gap remains unchanged when we control for pre-baseline test score performances and additional

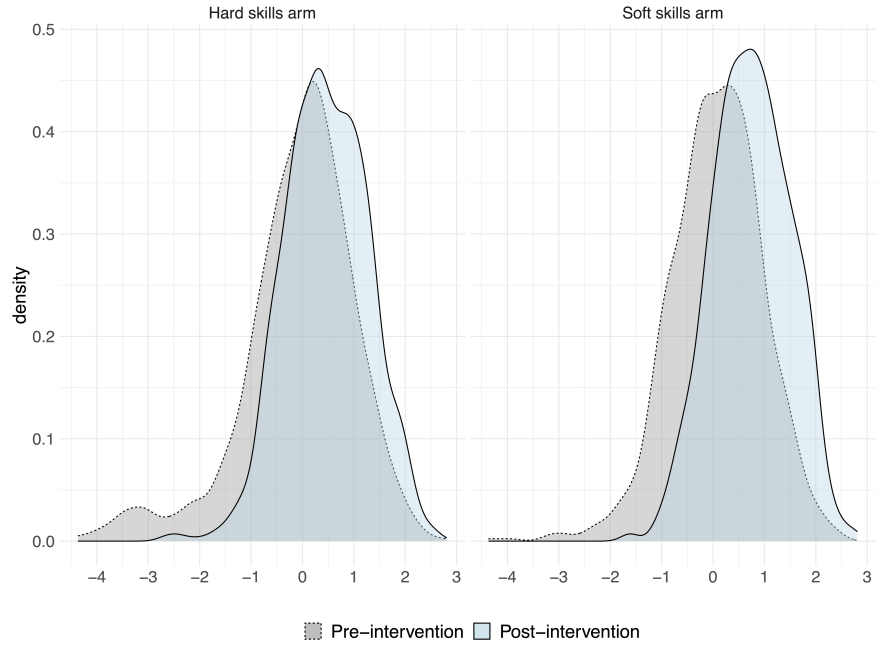
[12]Test scores for each assessment are standardized with respect to the mean and standard deviation of pre-treatment test performances.

Figure 2: Pre- and Post-Training Knowledge Assessments, by Treatment Arm

(a) Hard Skills Knowledge: Test Scores (z-score)



(b) Soft Skills Knowledge: Test Scores (z-score)



Note: Test scores on soft and hard skills assessments for the two treatment groups are standardized with respect to the mean and standard deviation of pre-treatment test scores of all youth in the treatment arms.

Table 3: Hard Skills Knowledge and Soft Skills – 3.5y Follow-up

	(1)	(2)	(3)	(4)	(5)
	Hard skills knowledge	Plasticity	Stability	Self-efficacy	Stress
Hard skills Treatment					
β	**0.131*** **	**0.130*** **	**0.134*** **	**0.052**	**-0.199*** **
se	[0.040]	[0.040]	[0.039]	[0.040]	[0.039]
RW p-value	0.010	0.010	0.010	0.267	0.001
Soft skills Treatment					
β	**0.130*** **	**0.175*** **	**0.065***	**0.093** **	**-0.176*** **
se	[0.040]	[0.040]	[0.039]	[0.040]	[0.040]
RW p-value	0.010	0.010	0.010	0.267	0.001
Mean control group	0.000	0.000	0.000	0.000	0.000
p-value Hard skills = Soft skills	0.986	0.214	0.110	0.212	0.594
Observations	3893	3893	3893	3893	3893

Note: Results are based on DML (K-fold=5, Splits=100); point estimates and standard errors across splits are calculated with the median method as in Chernozhukov et al. (2018). RW p-values are computed with the Romano-Wolf step-down correction, with 1,000 bootstrap repetitions. Plasticity and Stability correspond to the Big Five metatraits: Stability combines Emotional Stability, Agreeableness, and Conscientiousness; Plasticity combines Extraversion and Openness.

controls.

In terms of **soft skills knowledge**, the test scores for both treatment groups improved significantly, with a 0.28 sd score differential between treatment groups, consistent with the soft skills intensity of the assigned curricula. Soft Skills assessment test scores increased by 0.74 sd and 0.47 sd for those in the soft skill and hard skill groups, respectively.

5.2 Hard and Soft Skills: 3.5 Years Post-Intervention

Three and a half years after the intervention, meaningful differences in hard skills knowledge and psycho-social skills/traits remain relative to the control group in both treatment groups (see Table 3).

SEED graduates score better (0.13 sd) on the hard skill knowledge assessment, and exhibit greater ability to maintain stability and avoid disruption in emotional and social domains (*Stability*) and to engage flexibly with novelty, in both behavior and cognition (*Plasticity*).[13] Larger effect sizes for Stability emerge for the hard skill treatment group (0.13 sd for SEED Hard vs and 0.065

[13]The Big Five taxonomy of personality traits (Goldberg, 1993; John et al., 1991) was initially conceptualized as containing orthogonal dimensions. Recent work has revealed the presence of two higher-order personality traits: (1) *Stability, Self-Control, or Alpha* is composed of the shared variance of Emotional Stability (Neuroticism reversed), Conscientiousness, and Agreeableness; (2) *Plasticity, Engagement, or Beta* is composed of the shared variance of Extraversion and Openness/Intellect. For a review of these constructs see De Young (2006), Hirsh et al. (2009) and citations therein. In Appendix A, Table A.8, we report results for the individual dimensions of Big Five.

sd for SEED Soft, both significant at conventional levels). Plasticity coefficients are closer to each other, with a soft skill estimate of 0.175 sd and a hard skill treatment of 0.13 sd (the two effects not being statistically distinguishable). The psycho-social skills gain extends to youth's ability to better handle stress, with estimated effects of 0.2 sd and 0.18 sd for hard and soft curricula, respectively.

While the gaps in *intrapersonal skills* (as proxied by Plasticity, Stability, and Stress management skills) between the two treatments closed 3.5 years post-intervention, some important differences remain. These favor the soft skills treatment group and emerge for *self-efficacy*[14] (the belief about one's ability to effectively perform tasks, including interpersonal tasks, needed to achieve a valued goal) and *interpersonal soft skills* in the context of *negotiation and persuasion task-based measures*.

5.2.1 Task-Based Measures: Negotiation and Persuasion

When founding, running and growing a venture, entrepreneurs constantly need to negotiate. They regularly have to settle agreements with various stakeholders to acquire human and financial resources, making negotiation skills central to entrepreneurial success (Artinger et al., 2015). To assess whether the newly acquired skills can help youth in their entrepreneurial endeavors by providing them with better tools to negotiate more favorable prices or to persuade and convincingly present their business plans and point of view, we turn attention to negotiation and persuasion.

The defining characteristic of **negotiation** is the existence of two parties who share an important objective but have conflicting goals or interests (Bazerman and Neale, 1994). Negotiation is the process of interpersonal communication in which interested parties resolve disputes, agree upon courses of action, bargain for individual or collective advantage, and/or attempt to craft outcomes which serve their mutual interests. Effective negotiation involves skills such as communication, persuasion, planning, strategic thinking, and cooperating (Thompson (1990) and Bazerman et al. (2000)). To assess study participants' negotiation skills, we included a lab field experiment with the potential to generate real payoffs for both players (Bontempo and Iyengar, 2008).

The *Buyer* plays the role of Commissioner of the Ministry of Lands, who is tasked to purchase Butagira Farms to construct a rail line. The *Seller* plays the role of the owner of Butagira Farms. The Buyer (the enumerator) and Seller (the respondent) have already agreed that the land is worth UGX 600 million (approximately $573,295.75, PPP adjusted), but the two will need to agree on (1) financing terms, i.e., how much is paid upfront, with the remainder being paid in equal installments over a 12-month period (Table 5, Column 2); and (2) the project start date between two and 12 months (Table 5, Column 3).

Both Buyer and Seller are informed that they will be entered into a lottery with a $400 prize, with a probability of winning that is as a function of the number of points obtained in the final deal based on the payoff tables in Table 4.[15] The Seller and Buyer have four minutes to reach an

[14] Self-efficacy beliefs determine how people feel, think, motivate themselves and behave (Bandura, 2010). Self-efficacy does not refer to one's abilities but to how strongly one believes one can use one's abilities to work toward goals (Latham and Locke (2007) and Bandura (2010)). Self-efficacy is not a unitary construct or trait.

[15] Table 4 also summarizes the Buyer's and Seller's ideal outcomes and strategies. The Buyer prefers a down payment as small as possible and for the project to start in two months. The Buyer assigns relatively higher weight

Table 4: Negotiation: Payoff Tables

BUYER (ENUMERATOR): MUSUMBA PAYOFF TABLE				SELLER (SUBJECT): BUTAGIRA PAYOFF TABLE			
Financing		**Start Date**		**Financing**		**Start Date**	
Paid Down Payment UGX in millions	**Points**	**project start date**	**Points**	**Received Down Payment UGX in millions**	**Points**	**project start date**	**Points**
100	**500**	**2 months**	**1000**	100	0	2 months	0
150	450	3 months	900	150	100	3 months	50
200	400	4 months	800	200	200	4 months	100
250	350	5 months	700	250	300	5 months	150
300	300	6 months	600	300	400	6 months	200
350	250	7 months	500	350	500	7 months	250
400	200	8 months	400	400	600	8 months	300
450	150	9 months	300	450	700	9 months	350
500	100	10 months	200	500	800	10 months	400
550	50	11 months	100	550	900	11 months	450
600	0	12 months	0	**600**	**1000**	**12 months**	**500**

Note: Buyer's and Seller's strategies: the Seller, the respondent, prefers a full payment, UGX 600 million, up front and a delayed project start date; the Seller places relatively more weight on the financing arrangement than the starting date. The Buyer prefers a small down payment but an early start date; the Buyer assigns higher weight to the start date than to the financing arrangements.

agreement, which is the only scenario that will allow both of them to enter the lottery.

Table 5 summarizes these key outcomes. Youth in the soft skills-focused SEED exhibit better negotiation strategies not only relative to the control group but also relative to those in hard skills-focused SEED. The Seller's (respondent) best outcome corresponds to full payment up front (down payments equal to UGX 600 million) and a project start date in 12 months.[16] Negotiation strategies do not appear to influence the likelihood of agreement, which is fairly high even for the control group (81%); however, youth in the soft-skill SEED strike better/more advantageous deals for themselves: later starting dates (7%, approximately one week later) and higher down payments (9%, or approximately $28,892 which is roughly 5% of the value of the land), relative to the control group. There are no statistically significant impacts for youth who attended the hard skills treatment.

At the core of negotiation skills is **persuasion**; that is, the process of changing (without duress) a person's opinion, feelings, behaviors, or general evaluations (attitudes) toward some object, issue, or person (Cialdini, 2001). Communication, emotional intelligence, active listening, logic, and reasoning are some of the key skills for persuasion (Cialdini, 2018).[17]

to the starting date (more points) than to the financing arrangement (fewer points). The Seller prefers to a full payment, UGX 600 million, up front and a project start date in 12 months. The Seller places more weight (more points) on the financing arrangement than the starting date (fewer points).

[16] In a separate paper, we study in detail the negotiation strategies: youth in the soft treatment arm engage in lengthier conversations and provide longer arguments, (as proxied by the number of words used by both Sellers and Buyers), and engage in more rounds of offers and counter-offers.

[17] Cialdini (2018) describes six principles that are related to persuasion: (1) Liking – people like those who like them (uncover real similarities and offer genuine praise); (2) Reciprocity – people repay in kind (give what you want to receive); (3) Social proof – people follow the lead similar to that of others (use peer power whenever it's available);

Table 5: Task-based Measures: Negotiation and Persuasion

	(1)	(2)	(3)	(4)	(5)
	Negotiation			**Persuasion**	
	Agreement on final offer	Final agreement down payment (log)	Final agreement on start date (log month)	How convincing	Would like to hire
Hard skills Treatment					
β	**-0.028**	**0.027**	**-0.027**	**0.007**	**0.003**
se	[0.017]	[0.025]	[0.025]	[0.006]	[0.007]
RW p-value	0.399	0.618	0.618	0.618	0.675
Soft skills Treatment					
β	**-0.022**	**0.090*** **	**0.070*** **	**0.014** **	**0.015** **
se	[0.017]	[0.024]	[0.025]	[0.007]	[0.007]
RW p-value	0.190	0.006	0.035	0.099	0.096
Mean control group	0.814	321,017	3.749	0.022	0.026
p-value Hard skills = Soft skills	0.818	0.072	0.006	0.503	0.233
Observations	3689	2938	2938	3719	3719

Note: Results are based on DML (K-fold=5, Splits=100); point estimates and standard errors across splits are calculated with the median method as in Chernozhukov et al. (2018). RW p-values are computed with the Romano-Wolf step-down correction, with 1,000 bootstrap repetitions. Outcomes in columns (1), (4) and (5) are dichotomous variables.

During the persuasion task, the participant was asked to convince a group of hypothetical government officials who intend to distribute more land to farmers that you should be granted more land which, in turn, will make your business more profitable. Youth in the study were allotted one minute to make a persuasive pitch and their conversations were audio recorded. To assess the quality of the case they made, MBA students and business professionals recruited in Uganda were asked to score youth's performance during the *persuasion task*.

Youth in the soft skills treatment were more persuasive than youth in the control group. In particular, they were more likely to be identified as convincing (1.4 percentage point, pp, or equivalent to 64% more convincing), more likely to be someone whom the evaluators would hire (1.5 pp, or 57% more likely to be hired). Consistent with the results from the negotiation task, there are no significant impacts for the hard skill treatment group relative to the control group. However, we are unable to reject the null of equal impacts for the two treatment groups.

Overall, the findings in this section suggest that 3.5 years post-intervention, treatment groups performed better on hard skills knowledge assessments and demonstrated better soft skills relative to the control group. Furthermore, differentials in hard skills knowledge narrowed among youth attending the two curricula, as did the gap in intrapersonal skills such as Stability, Plasticity,

(4) Consistency – people align with their clear commitments (make their commitments active, public, and voluntary); (5) Authority – people defer to experts (expose your expertise; don't assume it's self-evident); and (6) Scarcity – people want more of what they can have less of (highlight unique benefits and exclusive information).

and Stress. However, some skill differentials have persisted: youth in the soft skill treatments demonstrated higher self-efficacy and more mastery of skills regulating interpersonal behavior and performance, such as negotiation and persuasion.

5.3 Economic Outcomes

We now turn to economic outcomes to better understand whether the newly acquired skills and business knowledge translated into business success and/or how they are rewarded in the labor market.

Youth in our sample are in their mid-20s and a large share (around 70%) are economically active (that is, either working for someone else or self-employed). Yet, SEED graduates are active at higher rates, with hard and soft skill treatment groups participating 6.2 pp (9.8%) more and 4.4 pp (7.1%) than the control group, respectively (see Table 6). Roughly 43% of the control group is currently working for someone else (i.e., dependent work). Youth in SEED hard and SEED soft are largely engaged in dependent work at similar rates, with those in SEED hard being engaged at marginally higher rates (3.8 pp, significant at the 10% level). As such, the difference in rates of economic activity is almost entirely driven by higher degrees of entrepreneurship among program participants. Hard and soft treatment groups are 19% (approximately 6 pp, for each treatment group) more likely to be self-employed. SEED graduates are also more likely to be contemporaneously self-employed and working for someone-else.

Table 6: Labor Market Outcomes: Employment Status

	(1)	(2)	(3)	(4)
	Economically Active	Currently working for someone else	Currently self employed	Currently working and self employed
Hard skills Treatment				
β	**0.066*** **	**0.038***	**0.063*** **	**0.035*** **
se	[0.018]	[0.020]	[0.019]	[0.013]
RW p-value	0.002	0.074	0.008	0.018
Soft skills Treatment				
β	**0.048*** **	**0.009**	**0.066*** **	**0.029** **
se	[0.019]	[0.020]	[0.019]	[0.013]
RW p-value	0.045	0.662	0.006	0.050
Mean control group	0.672	0.431	0.336	0.095
Observations	3891	3891	3890	3891
p-value Hard skills = Soft skills	0.490	0.320	0.907	0.746

Note: Results are based on DML (K-fold=5, Splits=100); point estimates and standard errors across splits are calculated with the median method as in Chernozhukov et al. (2018). RW p-values are computed with the Romano-Wolf step-down correction, with 1,000 bootstrap repetitions. All outcome variables are dichotomous; economically active is defined either working for someone else or self employed.

Table 7: Business creation and investment

	(1)	(2)	(3)	(4)	(5)
	Ever started a business	Number of businesses started	Business currently open	Number of employees (ihs, sf=4)	Business investment (ihs, sf=4)
Hard skills Treatment					
β	**0.105*** **	**0.105*** **	**0.063*** **	**0.216*** **	**0.557*** **
se	[0.020]	[0.019]	[0.019]	[0.068]	[0.155]
p-value	0.001	0.001	0.008	0.001	0.000
Elasticity				0.238	0.725
Soft skills Treatment					
β	**0.112*** **	**0.115*** **	**0.066*** **	**0.227*** **	**0.475*** **
se	[0.020]	[0.019]	[0.019]	[0.068]	[0.155]
p-value	0.001	0.001	0.002	0.000	0.001
Elasticity				0.252	0.588
Mean control group	0.474	0.725	0.336	1.653	1277.233
p-value Hard skills = Soft skills	0.803	0.694	0.907	0.907	0.707
Observations	3890	3890	3890	3887	3887

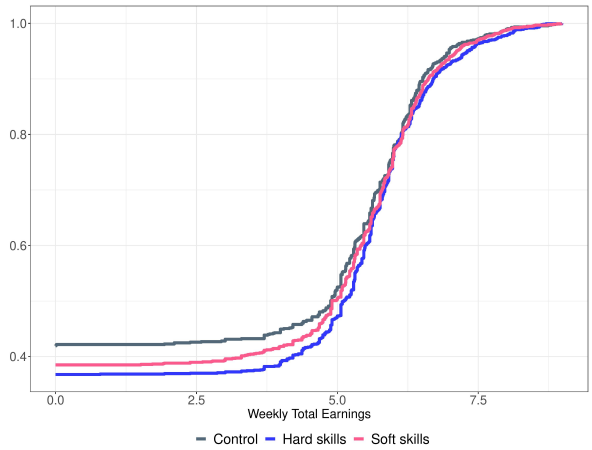
Note: Results are based on DML (K-fold=5, Splits=100); point estimates and standard errors across splits are calculated with the median method as in Chernozhukov et al. (2018). Dependent variables in columns (4) and (5) are in inverse hyperbolic sine (ihs or arcsinh) form. Suitable scaling factors (sf) for the transformed variables are chosen as in Aihounton and Henningsen (2021). Elasticities of the dependent variables with respect to treatment at their mean values are computed following Bellemare and Wichman (2020). p-values in columns (4) and (5) are one-sided. Outcomes in columns (4) and (5) are not conditional on employment status; number of employees (business investment) is defined as the joint outcome of owning a business and number of employees (business investment).

Indeed, SEED graduates are not only more likely to start a business (10.5 and 11.1 pp, respectively) relative to youth in the control group, 47.4% of whom started a business, but they also started more businesses and are more successful in ensuring their survival (see 7). 33.6% of the control group owned one or more business currently open at the time of our 3.5 year data collection. Youth in the treatment groups are 18% (approximately 6 pp) more likely to own currently open businesses, with no statistically significant difference between treatment groups.

The entrepreneurial efforts of SEED graduates also led to job creation (as proxied by the number of employees, hired by currently open enterprises) and yielded businesses with higher potential for growth and expansion (as proxied by business investment/capital). The last two columns of Table 7 capture these dimensions.

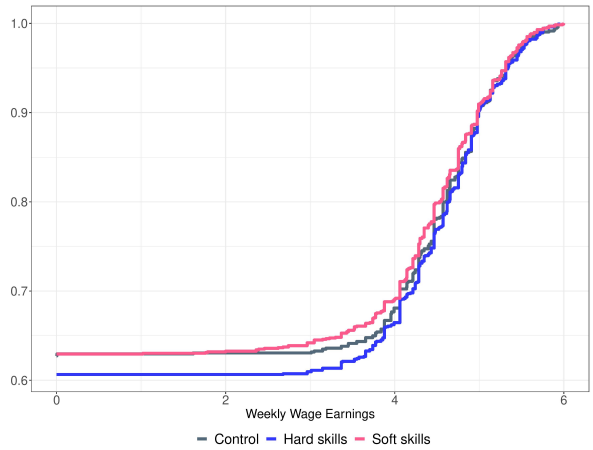
Businesses (open at the time of the 3.5 year follow-up) owned by youth enrolled in SEED generated 23.8% (SEED hard) and 25.2% (SEED soft) more jobs relative to the control group, as proxied by dependent employees. To put these figures into perspective, currently open businesses owned by SEED graduates were responsible for 63% of total employees in our sample; the program led to roughly 379 additional (current) jobs. These job figures exclude business owners and employees

Figure 3: Cumulative Distribution Functions, CDFs, for Selected Variables



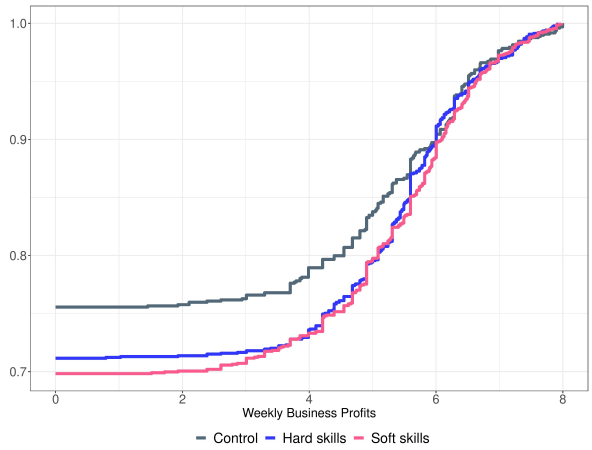
(a) Weekly Total Earnings, ihs sf=3

Hard skills vs Control, KS p-value = 0.020;
Soft skills vs Control, KS p-value = 0.460;
Hard skills vs Soft skills, KS p-value = 0.210.



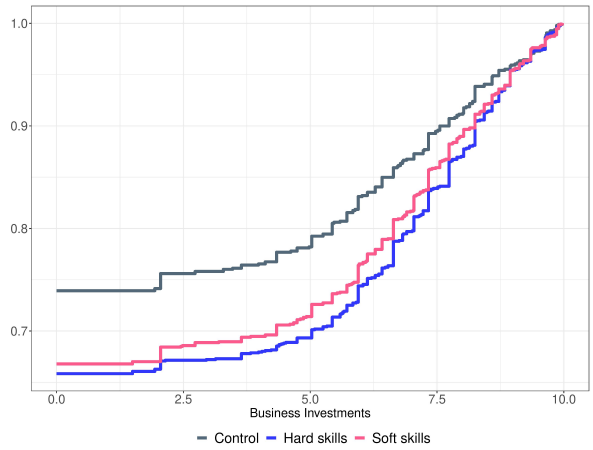
(b) Weekly Wage Earnings, ihs sf=1.1

Hard skills vs Control: KS p-value = 0.640;
Soft skills vs Control: KS p-value = 0.990;
Hard skills vs Soft skills: KS p-value = 0.250.



(c) Weekly Profits, ihs sf=3

Hard skills vs Control KS p-value = 0.090;
Soft skills vs Control, KS p-value = 0.050;
Hard skills vs Soft skills, KS p-value = 0.970.



(d) Business Investments (Capital), ihs sf=4

Hard skills vs Control, KS p-value = 0.000;
Soft skills vs Control, KS p-value = 0.010;
Hard skills vs Soft skills, KS p-value = 0.930.

Note: Variables are expressed in USD PPP adjusted. All variables are expressed are in inverse hyperbolic sine (ihs or arcsinh) form. Suitable scaling factors (sf) for the transformed variables are chosen as in Aihounton and Henningsen (2021). Below each graph we report p-values (KS p-value) for the corresponding pairwise CDFs Kolmogorov-Smirnov test. The KS test is invariant to ihs (scaled) and other transformations of the data

who were hired by businesses that were not open during the medium run follow-up. Furthermore, SEED graduates seeded enterprises that attracted considerably more capital investments than the control group: 72.5% and 58.8% for the hard and soft treatment groups, suggesting that SEED-led ventures may be of higher quality/potential.[18] Figure 3d compares the CDFs of log business investments (capital): the distributions of the two treatments groups are indistinguishable, but are statistically different from that of the control group. The gap results largely from a differential mass at zero business investment, either because youth in the control group have no capital investment conditional on owning a business or because they do not own an enterprise. The hard and soft treatment groups are 27% and 23% more likely to report positive capital investments relative to the control group.

5.3.1 Total Earnings, Wage Earnings, and Profits

Taken altogether, SEED graduates possess better knowledge and better intra- and inter-personal skills to succeed in the labor market; overall, they are more likely to start businesses that survive over time and higher quality ventures that create employment opportunities and attract larger capital investments. A complementary set of outcomes pertains to the extent to which the upgrades in entrepreneurship mindset and skills are rewarded in the labor market and translate into more profitable enterprises (see Table 8).

Weekly (current) earnings from all sources for both treatment groups significantly outpace those of the control group; namely, earnings for the hard and soft skill treatments are 38.7% and 21.2% higher, respectively. A closer examination of the total earnings CDF (Figure 3a) suggests that differences in earnings begin to emerge around the median, when earnings in the control group start lagging behind those of the treatment groups.

Segregating between wage earnings and business earnings (profits),[19], the aforementioned earnings gap between treatment and control groups is largely explained by business profits: SEED graduates report 27.8% (hard) and 34.8% (soft) higher profits than their counterparts in the control group.

Previous research has noted that business skills training had limited impact on businesses' performance. However, interventions that are tailored to participants' needs or foster an entrepreneurial mindset have shown more promise. The impacts on profits reported here are comparable to those of Campos et al. (2017), where training increased profits by 30%, the only other study focusing on soft-skills/personal initiative training that detected positive and significant impacts on profits (McKenzie, 2020).

Taken altogether, our results point to the fact that SEED training was successful in jump-

[18] Youth in the soft skills-focused training were also more likely to start a formal business (3 pp, 23%) relative to the control group.

[19] Weekly profits (wage earnings) are defined as the joint outcome of owning a business (working for someone else) and current monthly profits (earnings). ITT estimates for outcomes that are conditional on employment status (e.g., defined only for entrepreneurs and/or wage workers) would be biased and inconsistent, since it would imply conditioning on an outcome that is endogenous to treatment.

Table 8: Weekly Earnings

	(1)	(2)	(3)
	Current Total Earnings (ihs, sf=3)	Business Profits (ihs, sf=3)	Wage Earnings (ihs, sf=1.1)
Hard skills Treatment			
β	**0.335*** **	**0.251** **	**0.163***
se	[0.124]	[0.109]	[0.100]
p-value	0.004	0.011	0.052
Elasticity	0.387	0.278	0.171
Soft skills Treatment			
β	**0.200***	**0.305*** **	**-0.004**
se	[0.125]	[0.110]	[0.099]
p-value	0.054	0.003	0.483
Elasticity	0.212	0.348	-0.009
Mean control group (USD PPP adjusted)	72.192	47.568	24.493
p-value Hard skills = Soft skills	0.443	0.730	0.235
Observations	3568	3763	3568

Note: Results are based on DML (K-fold=5, Splits=100); point estimates and standard errors across splits are calculated with the median method as in Chernozhukov et al. (2018). All dependent variables are in inverse hyperbolic sine (ihs or arcsinh) form. Suitable scaling factors (sf) for the transformed variables are chosen as in Aihounton and Henningsen (2021). Elasticities of the dependent variables with respect to treatment dummies at their mean values are computed following Bellemare and Wichman (2020). One-side p-values are reported. Outcomes in columns (2) and (3) are not conditional on employment status; weekly business profits (wage earnings) are defined as the joint outcome of owning a business (wage work) and profits (wage earnings).

starting youth human capital (soft and hard skills) accumulation to set them on a higher earning trajectory and expanded income opportunities. Moreover, the program contributed to the creation of vibrant ventures, with SEED graduates behaving like *transformational/opportunity entrepreneurs* (as in Schoar, 2010; Ardagna and Lusardi, 2010): that is, they were more successful in creating dynamic businesses that grown beyond the scope of an individual's subsistence needs and provide jobs and income for others.

5.4 Costs and Benefits

Cost analysis falls into two broad categories: Cost-Benefit Analysis and Cost Effectiveness. CE captures the amount of "effect" a program achieves on one outcome for a given cost, while cost-benefit analysis combines all the different costs and benefits of a program into a single scale (usually a monetary metric) and shows the ratio of combined benefits to combined costs (Dhaliwal et al., 2012).

The conservative measure of benefits that we consider in this section is youths' monthly earnings 3.5 years post-intervention. This is a conservative measure of benefit since it abstracts from any

benefits that are realized since the intervention as well as from any impacts on mental well-being or those resulting from job creation and social spillovers, all of which are difficult to monetize. This said, the non-monetary benefits of such skills training programs – and of SEED training, in particular – can be quite sizable.[20] A medium run evaluation of another secondary school social leadership intervention carried out by Educate!, our implementing partner for SEED, suggests even larger non-monetary impacts.[21]

The research and evaluation team was directly involved in the implementation and supervision of the SEED program, as such we have access to detailed information on intervention costs. Total intervention costs were estimated at $118 per student.[22] To put these numbers into perspective, based on McKenzie (2020)'s random effects meta-analysis, traditional (hard skills only) training programs yield positive average effects on both profits (10.1%) and sales (4.6%). Costs for these program range from $400 to $12,242 for a class of 20; averaging $3,537 or US $177 per participant. For a firm earning US$100 a month, a 10% increase in profits would recover the $177 cost of a training within 18 months McKenzie et al. (2020).

Campos et al. (2017)'s personal initiative training, which is more directly comparable to SEED's curricula, cost US$756 per invited participant and yielded a $60-per-month increase in monthly profits over the first two years. Youth in the hard and soft skill trainings earned an additional $118.7 and $65.0 per month, respectively—however, we fail to reject the null that treatment effects for the soft and hard skill groups are equal. Therefore, if SEED's program benefits are proxied by treatment effects on monthly earnings 3.5 years post-intervention, one month (two months) of earnings alone would exceed the cost of the hard (soft) SEED program.

These benefits abstract from the job- and business-creation benefits of the program, which were meaningful: relative to the control group, SEED entrepreneurs created 985 additional (employee) jobs and 550 new businesses. A crude measure of job creation and of the social returns to the program is the impact of the training on weekly payroll, a proxy for the value of the additional jobs created.

Weekly payrolls for SEED businesses were 36% (hard) and 37% (soft) higher (both statistically significant) relative to the control group (see Table 9, panel B). That is, the yearly implied values of the additional job created are approximately $695.26 and $699.16 for the hard and soft treatments, respectively. The program's annual private and social benefits, as captured by private earnings and by the value of additional jobs, are substantial (see Table 9, panel C) : $2,148.05 for SEED hard and $1,495.01 for SEED soft. Between a third and nearly half of these benefits are accounted for by the program's impacts on (the value of) job creation (SEED hard: 32% and SEED soft: 46.8%),

[20] SEED graduates report being more satisfied with their quality of life (0.16 sd and 0.17 sd for hard- and soft-skills treatments, respectively); as documented earlier, they also report less stress.

[21] The Educate! program generated substantial social spillovers along several dimensions: delayed family formation, lower incidence of risky behaviors, shifts in gender-related social norms, and reductions in intimate partner violence.

[22] Total costs included salaries and benefits for trained teachers (10%), curriculum development and testing (2%), teacher recruitment and training (4%), site management staff costs (4%), venue, transports, meal, staff plus other students costs (67%), training materials and supplies (5%), supervision and support to teachers (2%), and administration country office (5%).

Table 9: Private and Social Returns

A. Tot Weekly Earnings	Estimated Elasticity	E(Earnings) Control	monthly (*4.25)	yearly (*52 weeks)
Hard skills Treatment	0.39	$ 72.19	$ 118.74	$ 1,452.79
Soft skills Treatment	0.21	$ 72.19	$ 65.04	$ 795.84

B. Weekly Payroll	Elasticity	E(Payroll) Control	monthly (*4.25)	yearly (*52 weeks)
Hard skills Treatment	0.36	$ 36.67	$ 56.82	$ 695.26
Soft skills Treatment	0.37	$ 36.67	$ 57.14	$ 699.16

C. Yearly Private vs Social Benefits	Tot. Earnings + Payroll	Payroll / Tot Benefits	Benefits / Cost of Intervention
Hard skills Treatment	$ 2,148.05	32.4%	18.2:1
Soft skills Treatment	$ 1,495.01	46.8%	12.7:1

with implied total Benefits-to-Cost ratios of 18.2:1 and 12.7:1 for hard and soft SEED, respectively.

6 Concluding Remarks

In this paper, we study the medium-term impacts of SEED, which was implemented at-scale in Uganda. SEED is an innovative in-residence 3-week mini-MBA modeled after western business school curricula. The program featured two separate treatments, with the hard-skills MBA featuring a mix of approximately 75% hard skills and 25% soft skills and the soft skills curriculum having the reverse mix.

SEED training was successful not only at jump-starting youth human capital accumulation (both soft and hard skills), but also at setting them on higher earnings trajectories and expanding their income opportunities. In particular, SEED was a catalyst for the inception of dynamic and more profitable ventures which attracted larger capital investments, and expanded employment opportunities, creating over 985 additional (employee) jobs. Our results point to SEED graduates behaving like *transformational/opportunity entrepreneurs* (as in Schoar, 2010). The intervention was highly cost-effective and compares favorably to existing training alternatives that tend to be more expensive and often yield lower benefits.

Two critical program features support SEED's effectiveness. First, SEED was designed and implemented as a high quality intervention. The curricula were informed by rigorous evidence from the economic and psychology literatures, which have been able to identify which skills/personality traits matter in shaping high performing entrepreneurs. Furthermore, teachers received extensive, high quality training on teaching methods and soft and hard skills knowledge. Implicitly, our results corroborate the proposition that high quality teacher and youth trainings can be delivered

at relatively low costs.

Second, SEED targeted youth at the end of secondary school, which is earlier in life than traditional training interventions. This critical age and developmental stage has garnered increasing attention. The period of adolescence through to mid-20s represents a critical stage of brain development, featuring high degrees of plasticity in those areas of the brain that are responsible for the regulation of automatic or instinctive reactions, risk-taking behavior, self-control, reflective reasoning, communication, among others. In fact, research increasingly points to youth as the key phase during which those skills that are at the core of transformational entrepreneurship can be shaped.

It is also worth highlighting that youth in our study are positively selected: not only were they in their last year of secondary school, but the majority also planned to attend university, both of which correlate with higher ability. Larger effects for higher potential individuals is consistent with the calls for better targeting emerging from recent work. Having estimated no program effects for business training or workfare programs, some authors examined impact heterogeneity and concluded that a more careful targeting of businesses could improve the impacts these programs (e.g., Bardasi et al., 2021; Bertrand et al., 2021, and citations therein). The efficacy of SEED for youth with lower levels of education/ability remains untested and is an avenue we are planning on exploring.

Several important questions remain, which we hope to answer with our 8-year follow-up. As McKenzie and Woodruff (2017) points out, most of the existing literature on business training does not examine the effects of the training at different points in time. The few exceptions indicate that some effects disappear in the longer term (e.g., Blattman, Fiala and Martinez, 2020; Blattman, Dercon and Franklin, 2019). Furthermore, while SEED explicitly features soft skills (with two distinct intensities) as a centerpiece of its curriculum, we only observe differences in inter-personal skills and self-efficacy between the two treatment arms, but no statistical differences overall for economic outcomes. Will this pattern persist in long-term or are returns to inter-personal skills just slower to emerge?

SEED-like interventions call for future research to gain insight into their optimal timing (how late or how early can these skills be taught?), into their complementarities with other initiatives (e.g., start-up capital, mentoring) and into potential social spillovers of these skills on non-economic outcomes (e.g., gender empowerment). Between 2010 and 2030, global labor markets will need to generate roughly three-quarters of a billion new jobs (Bloom et al., 2018), an especially daunting task in light of growing young populations and often-underperforming education systems – themselves under additional stress during the pandemic. As a result, training programs designed to "make" transformational entrepreneurs capable of generating positive ripple effects for the economy are critical investments to face this development challenge.

A Appendix: Tables

Table A.1: Baseline Balance Table: Baseline Sample

	Control (n=1,198)	**Hard Skills (n=1,613)**	**Soft Skills (n=1,591)**	***p*-values**		
	Mean	Mean	Mean	Hard vs Control	Soft vs Control	Hard vs Soft
Demographics and Expectations						
Age at baseline	20.04	20	20	0.423	0.429	0.994
Female	0.34	0.36	0.36	0.204	0.219	0.968
Boarding student	0.74	0.73	0.73	0.69	0.619	0.914
Business work experience index (Anderson)	0.02	-0.01	-0.01	0.107	0.184	0.761
Future subjective personal wealth (z-score)	-0.02	0.02	0.00	0.304	0.524	0.676
Plans to attend university (indicator)	0.71	0.7	0.71	0.498	0.885	0.566
Family background						
Parental SES index (Anderson)	0.00	-0.01	0.00	0.675	0.994	0.646
Housing index (Anderson)	-0.01	0.01	0.00	0.51	0.683	0.787
Subjective family weath (z-score)	-0.02	0.00	0.01	0.592	0.379	0.709
Big 5 (z-score)						
Extraversion	2.73	2.75	2.7	0.545	0.405	0.12
Openness	4.15	4.13	4.13	0.494	0.361	0.801
Emotional stability	3.86	3.88	3.85	0.473	0.891	0.356
Agreeable	3.63	3.63	3.61	0.908	0.588	0.477
Conscientious	3.88	3.9	3.88	0.612	0.892	0.488
Skills (z-score)						
Memory (# digits recited backwards)	0.04	-0.01	-0.02	0.152	0.138	0.953
Intelligence (# Raven's matrices correct)	-0.01	0.02	-0.01	0.326	0.841	0.399
UACE O-levels score	-0.04	0.03	0.00	0.061	0.223	0.479
Math and business knowledge index	0.01	0.01	-0.02	0.99	0.339	0.307
Leadership index	-0.03	0.00	0.04	0.345	0.071	0.349
Perceived control index	0.00	0.01	0.01	0.938	0.789	0.836
Self-confidence index	0.05	-0.04	0.01	0.016	0.249	0.176
Prosocial index	-0.05	0.00	0.05	0.169	0.013	0.226
Patience index	-0.02	0.02	0.01	0.277	0.385	0.815
Willingness to take risks	0.00	0.00	0.00	0.959	0.914	0.864
Teacher and peer acceptance index	-0.03	0.01	0.03	0.248	0.111	0.633
Anxiety and depression index	-0.05	0.00	0.04	0.166	0.017	0.279
Travel time (hours)						
School to hard skills host school	1.49	1.51	1.50	0.583	0.791	0.759
School to hard skills meeting point	1.31	1.33	1.32	0.502	0.667	0.795
school to soft skills host school	1.21	1.24	1.23	0.434	0.603	0.779
School to soft skills meeting point	1.14	1.17	1.16	0.503	0.661	0.804
F-test of joint significance (F-stat)				1.27	1.20	0.59
p-value				0.167	0.221	0.951

Table A.2: Baseline Balance Table: Take-up Sample and Control Group

	Control (n=1,198)	**Hard skills (n=1,089)**	**Soft skills (n=1,105)**	***p*-values**		
	Mean	Mean	Mean	Hard vs Control	Soft vs Control	Hard vs Soft
Demographics and Expectations						
Age at baseline	20.04	20.07	20.06	0.692	0.77	0.917
Female	0.34	0.32	0.33	0.446	0.588	0.827
Boarding student	0.74	0.70	0.71	0.035	0.139	0.532
Business work experience index (Anderson)	0.02	-0.01	0.00	0.159	0.358	0.629
Future subjective personal wealth (z-score)	-0.02	-0.01	0.00	0.669	0.561	0.882
Plans to attend university (indicator)	0.71	0.66	0.71	0.016	0.806	0.034
Family background						
Parental SES index (Anderson)	0.00	-0.02	-0.02	0.352	0.336	0.978
Housing index (Anderson)	-0.01	-0.06	-0.05	0.158	0.26	0.776
Subjective family weath (z-score)	-0.02	-0.04	-0.04	0.636	0.685	0.947
Big 5 (z-score)						
Extraversion	2.73	2.76	2.72	0.382	0.822	0.282
Openness	4.15	4.11	4.14	0.228	0.751	0.383
Emotional stability	3.86	3.87	3.86	0.694	0.881	0.811
Agreeable	3.63	3.6	3.59	0.303	0.245	0.901
Conscientious	3.88	3.87	3.88	0.634	0.771	0.855
Skills (z-score)						
Memory (# digits recited backwards)	0.04	-0.06	-0.06	0.014	0.017	0.934
Intelligence (# Raven's matrices correct)	-0.01	0.02	-0.02	0.368	0.973	0.36
UACE O-levels score	-0.04	0.05	0.02	0.03	0.129	0.516
Math and business knowledge index	0.01	0.01	-0.02	0.887	0.354	0.444
Leadership index	-0.03	0.02	0.03	0.225	0.149	0.826
Perceived control index	0.00	0.01	0.01	0.872	0.929	0.944
Self-confidence index	0.05	-0.03	0.02	0.041	0.39	0.244
Prosocial index	-0.05	0.00	0.05	0.296	0.022	0.225
Patience index	-0.02	0.04	0.02	0.16	0.339	0.657
Willingness to take risks	0.00	0.00	0.02	0.92	0.616	0.556
Teacher and peer acceptance index	-0.03	0.02	0.02	0.164	0.205	0.901
Anxiety and depression index	-1.17	-1.19	-1.18	0.041	0.39	0.244
F-test of joint significance (F-stat)				1.73	1.18	1.22
p-value				0.013	0.247	0.200

Table A.3: Attrition

	(1)		(2)	
	β	se	β	se
Hard Skills Treatment	-0.044***	(0.012)	-0.044***	(0.012)
Soft Skills Treatment	-0.040***	(0.012)	-0.038***	(0.012)
Demographics and Expectations				
Age at baseline			0.009**	(0.004)
Female			0.025**	(0.011)
Boarding student			-0.016	(0.012)
Business work experience index (Anderson)			-0.005	(0.011)
Future subjective wealth (z-score)			-0.010**	(0.005)
Plans to attend university (indicator)			-0.028**	(0.011)
Family background				
Parental SES index (Anderson)			0.020**	(0.010)
Housing index (Anderson)			-0.021***	(0.007)
Subjective family weath (z-score)			0.000	(0.005)
Big 5 (z-score)				
Extraversion			-0.010*	(0.006)
Openness			-0.01	(0.007)
Emotional stability			0.005	(0.007)
Agreeable			0.008	(0.008)
Conscientious			0.006	(0.008)
Skills (z-score)				
Memory (# digits recited backwards)			-0.012**	(0.005)
Intelligence (# Raven's matrices correct)			-0.002	(0.005)
UACE O-levels score			0.003	(0.005)
Math and business knowledge index			-0.007	(0.005)
Leadership index			-0.010*	(0.006)
Perceived control index			0.000	(0.005)
Self-confidence index			-0.002	(0.006)
Prosocial index			-0.004	(0.006)
Patience index			0.005	(0.005)
Willingness to take risks			0.002	(0.005)
Teacher and peer acceptance index			-0.003	(0.006)
Anxiety and depression index			-0.007	(0.006)
Travel time				
School to hard skills host school			0.024*	(0.013)
School to hard skills meeting point			0.009	(0.015)
school to soft skills host school			-0.003	(0.020)
School to soft skills meeting point			-0.009	(0.024)
Observations	4,402		4,402	

Table A.4: Baseline Balance Table: Estimation Sample, 3.5 year Follow-up

	Control (n=1,022)	Hard skills (n=1,447)	Soft skills (n=1,421)	*p*-values		
	Mean	Mean	Mean	Soft vs Hard	Soft vs Control	Hard vs Control
Demographics and Expectations						
Age at baseline	20.00	19.98	20.00	0.735	0.981	0.692
Female	0.32	0.36	0.35	0.036	0.094	0.647
Boarding student (indicator)	0.75	0.73	0.74	0.390	0.483	0.865
Business work experience index (Anderson)	0.02	-0.01	0.00	0.229	0.311	0.839
Future subjective wealth (z-score)	0.01	0.03	0.01	0.548	0.998	0.509
Plans to attend university (indicator)	0.72	0.70	0.72	0.501	0.811	0.318
Family background						
Parental SES index (Anderson)	0.00	-0.01	0.00	0.730	0.749	0.466
Housing index (Anderson)	0.01	0.02	0.01	0.834	0.929	0.896
Subjective family wealth (z-score)	0.00	0.00	0.02	0.966	0.629	0.629
Big 5 (z-score)						
Extraversion	2.74	2.76	2.71	0.750	0.358	0.174
Openness	4.15	4.15	4.14	0.843	0.547	0.657
Emotional stability	3.86	3.87	3.86	0.543	0.974	0.528
Agreeable	3.62	3.62	3.62	0.997	0.964	0.964
Conscientious	3.89	3.90	3.88	0.686	0.809	0.478
Skills (z-score)						
Memory (# digits recited backwards)	0.05	0.00	-0.02	0.183	0.085	0.663
Intelligence (# Raven's matrices correct)	-0.01	0.04	-0.01	0.298	0.925	0.214
UACE O-levels score	-0.07	0.02	-0.01	0.037	0.149	0.484
Math and business knowledge index	0.01	0.02	0.00	0.804	0.677	0.466
Leadership index	-0.01	0.02	0.05	0.497	0.119	0.334
Perceived control index	0.00	0.00	0.02	0.874	0.669	0.520
Self-confidence index	0.07	-0.02	0.01	0.013	0.098	0.371
Prosocial index	-0.03	0.02	0.05	0.285	0.046	0.308
Patience index	-0.03	0.01	0.01	0.282	0.359	0.866
Willingness to take risks	-0.01	0.01	0.01	0.510	0.584	0.905
Teacher and peer acceptance index	0.00	0.02	0.03	0.639	0.449	0.750
Anxiety and depression index	-0.05	0.00	0.04	0.232	0.046	0.378
Travel time (hours)						
School to hard skills host school	1.43	1.47	1.46	0.304	0.440	0.782
School to hard skills meeting point	1.25	1.30	1.30	0.222	0.263	0.915
School to soft skills host school	1.18	1.22	1.24	0.354	0.192	0.677
School to soft skills meeting point	1.11	1.15	1.17	0.359	0.185	0.650
F-test of joint significance (F-stat)				1.07	1.01	0.46
p-value				0.368	0.444	0.995

Table A.5: Take-up Rates

	(1)		(2)	
	Hard skills		Soft skills	
	β	se	β	se
Demographics, Experience, Expecations				
Age at baseline	0.003	(0.009)	0.003	(0.009)
Female	-0.079***	(0.028)	-0.077***	(0.027)
Boarding student	-0.107***	(0.028)	-0.038	(0.028)
Business work experience index (Anderson)	-0.020	(0.028)	0.008	(0.029)
Future subjective personal wealth (z-score)	-0.004	(0.012)	0.014	(0.013)
Plans to attend university (indicator)	-0.092***	(0.027)	0.013	(0.027)
Family background				
Parental SES index (Anderson)	0.038	(0.025)	-0.018	(0.025)
Housing index (Anderson)	-0.063***	(0.016)	-0.027*	(0.016)
Subjective family weath (z-score)	-0.003	(0.013)	-0.028**	(0.013)
Big 5 (z-score)				
Extravesion	0.013	(0.013)	0.015	(0.014)
Openness	-0.026	(0.018)	0.025	(0.017)
Emotional stability	-0.003	(0.018)	0.008	(0.018)
Agreeable	-0.031	(0.020)	-0.012	(0.019)
Conscientious	-0.039**	(0.018)	-0.010	(0.019)
Skills (z-score)				
Memory (# digits recited backwards)	-0.038***	(0.012)	-0.036***	(0.012)
Intelligence (# Raven's matrices correct)	0.016	(0.013)	-0.005	(0.013)
UACE O-levels score	0.007	(0.013)	0.011	(0.013)
Math and business knowledge index	0.003	(0.012)	-0.002	(0.012)
Leadership index	0.026*	(0.014)	-0.012	(0.014)
Perceived control index	0.000	(0.013)	-0.006	(0.012)
Self-confidence index	0.017	(0.013)	0.006	(0.014)
Prosocial index	0.001	(0.014)	0.009	(0.015)
Patience index	0.002	(0.013)	0.004	(0.013)
Willingness to take risks	0.008	(0.012)	0.011	(0.013)
Teacher and peer acceptance index	0.010	(0.014)	-0.011	(0.014)
Anxiety and depression index	0.015	(0.014)	-0.011	(0.013)
Constant	1.122***	(0.236)	0.561**	(0.239)
Treatment group take-up rate	0.678		0.698	
Observations	1,613		1,591	
R-squared	0.096		0.069	

Table A.6: Compliers and Defiers

	No Attendance	**Attendance**	**Total**
Control group	1,022	0	1,022
T1: Hard skills	442	1,005	1,447
T2: Soft skills	405	1,016	1,421
Total	1,869	2,021	3,890

Table A.7: Knowledge Hard Skills: Disaggregated Elements

	(1)	(2)	(3)	(4)	(5)	(6)
	Opportunities for generating business ideas	Effects of competition	Cost categorization	Utility of record keeping	Profit/loss statements	Hard skills index
Hard skills Treatment						
β	**0.116*** **	**0.062**	**0.127*** **	**0.033**	**-0.007**	**0.131*** **
se	[0.041]	[0.040]	[0.041]	[0.041]	[0.041]	[0.040]
RW p-value	0.027	0.443	0.013	0.695	0.730	-
Soft skills Treatment						
β	**0.132*** **	**0.131*** **	**0.068***	**-0.010**	**0.006**	**0.130*** **
se	[0.041]	[0.041]	[0.041]	[0.041]	[0.041]	[0.040]
RW p-value	0.011	0.011	0.303	0.982	0.990	-
Mean control group	0.000	0.000	0.000	0.000	0.000	0.000
p-value Hard skills = Soft skills	0.779	0.237	0.301	0.460	0.832	-
Observations	3893	3893	3893	3893	3893	3893

Note: Results are based on DML (K-fold=5, Splits=100); point estimates and standard errors across splits are calculated with the median method as in Chernozhukov et al. (2018). RW p-values are computed with the Romano-Wolf step-down correction, with 1,000 bootstrap repetitions.

Table A.8: Big Five, Individual Dimensions

	(1)	(2)	(3)	(4)	(5)
	Agreeable	Conscientious	Extrovert	Emotional Stability	Openness
Hard skills Treatment					
β	**0.088****	**0.115*****	**0.130*****	**0.115*****	**0.078***
se	[0.039]	[0.040]	[0.040]	[0.040]	[0.040]
RW p-value	0.065	0.026	0.025	0.026	0.065
Soft skills Treatment					
β	**0.062**	**0.055**	**0.157*****	**0.038**	**0.122*****
se	[0.039]	[0.040]	[0.040]	[0.040]	[0.040]
RW p-value	0.242	0.270	0.002	0.370	0.008
Mean control group	0.000	0.000	0.000	0.000	0.000
p-val Hard skills = Soft skills	0.634	0.282	0.627	0.178	0.435
Observations	3893	3893	3893	3893	3893

Note: Results are based on DML (K-fold=5, Splits=100); point estimates and standard errors across splits are calculated with the median method as in Chernozhukov et al. (2018). RW p-values are computed with the Romano-Wolf step-down correction, with 1,000 bootstrap repetitions.

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