



Short-term impact of the startUP&go entrepreneurship education programme in South Africa



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*A first follow-up survey in a quasi-experimental and longitudinal study of
an experiential entrepreneurship education programme in South Africa*

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1. Introduction

The youth unemployment challenge remains high on international and national development agendas and governments across the world are increasingly looking for responses to tackle the challenge. The weakening of the global recovery in 2012 and 2013 has further aggravated the youth jobs crisis and the queues for available jobs have become longer and longer (ILO, 2013). The global youth unemployment rate stood 13.1 per cent in 2013 with 74.5 million youth (aged 15-24) being unemployed (ILO, 2014). While unemployment rates are high, school enrolment rates have never been higher. Young people today are more educated than before and the number of young people enrolled in secondary and tertiary education is increasing. Education and training are essential for young people to enter the labour market successfully as this increases their employability and productivity in the work place.

South Africa is no exception; in fact the country currently records one of the highest national youth unemployment rates globally due to South Africa being an exceedingly young nation with almost 60 per cent of the population being under the age of 35 years. The median age is 25.3 years and 28.9 per cent of the population is defined as youth between 15-34 years. The 2nd quarter labour force surveys from Statistics South Africa shows an unemployment rate of 25.5 per cent with 5.2 million unemployed.¹ The youth account for the highest proportion of the unemployed at 71 per cent. The unemployment rate among the youth is 36.1 per cent and more than 31 per cent equivalent to 3.3 million young people are neither in employment, education or training (NEET) and are regarded as idle youth. The Free State province records the highest youth unemployment rate in South Africa at close to 50 per cent (South African SME Observatory, 2013)

A particularly disturbing finding emerging from the labour force data is the finding that among the younger unemployed respondents, four out of five have never had a job. Research from the Global Entrepreneurship Monitor (GEM, 2011) has shown that the majority of people starting businesses were employed while developing their business. The fact that so many young people in South Africa are excluded from the work arena means that they will have been denied the opportunity to access knowledge and develop skills. This makes it unlikely that they will ever be able to break into the labour force – either in the formal sector or through self-employment.

The high levels of youth unemployment comes hand-in-hand with an educational system that, although well-funded with one fifth of the state budget, delivers highly unsatisfactory results. South Africa is ranked 146 out of 148 countries in terms of quality of education according to the World Economic Forum (World Economic Forum, 2013). Many school-leavers do not possess sufficient literacy, numeracy and life skills to be able to participate actively in the economy. Those who do attempt to engage in business activities lack basic business management skills technical as well as employment experience and are therefore at a disadvantage in a competitive and changing business environment. By comparison, in South Africa only 1 per cent of the youth are formal entrepreneurs, a number significantly lower than in other African countries and most developing countries (South African SME Observatory, 2013).

¹ The highest rate recorded since the inception of the quarterly labour force surveys in 2008.

Entrepreneurship education ranks highly on policy agendas in Europe and the United States of America (World Economic Forum, 2009), but little rigorous research is available to assess its impact (Haftendorn & Salzano, 2003; Weber et al, 2009; Lepoutre et al., 2010). Entrepreneurship education has become important in national education and employment strategies in many developing countries (Rezende & Christensen, 2009) and is increasingly considered an important strategy towards tackling the youth unemployment challenge. Today, it is widely accepted that new venture creation is an important means for economic growth, technological progress and employment creation (Sheshinski et al., 2007; Weber et al., 2009).

Universities and higher learning institutions in many countries have followed the example of American educational institutions and have introduced a wide range of entrepreneurship education efforts (Fayolle, 2000; Lin, 2004). Entrepreneurship education is promoted in schools and communities in many parts of the world to better prepare school leavers to enter labour markets where formal employment opportunities are scarce, but also to support young people already in the labour market in new venture creation.

In South Africa, business studies is a subject offered at secondary school in grades 10, 11 and 12 as an elective. The learning outcomes are guided by the Curriculum Assessment Policy Statement (CAPS) and highlight the need for producing learners that are able to identify and solve problems and make decisions using critical and creative thinking. Learners work effectively as individuals and with others as a member of a team and organise and manage themselves and their activities responsibly to also enter into self-employment (Department of Education, 2011)

In light of the grave youth unemployment challenge in South Africa, and in the Free State province in particular, the International Labour Organization (ILO) and the Department for Economic Development, Tourism and Environmental Affairs (DETEA) is implementing a project in the Free State with the objective of contributing to employment creation through the promotion of entrepreneurship and Small and Medium Enterprise (SME) development.

One of the desired outcomes of the project is a more entrepreneurial mind-set among young men and women in the Free State in terms of: a) improved attitudes towards the merits of entrepreneurship, b) increased entrepreneurial intentions and c) more young people starting formal enterprises, i.e. higher levels of entrepreneurial activity among youth. In support of these outcomes, one of the components of the project is the introduction of entrepreneurship content in the business studies course in grade 10, 11 and 12 in secondary schools across the Free State province.

The objective is to better prepare school leavers for the transition from school to a South African labour market where formal jobs are scarce and equip them, on the one hand, with competencies to identify and pursue business opportunities to improve their chances of success in business and self-employment ventures and, on the other hand, to equip them with improved life skills that could result in increased employability and satisfaction with their own decisions concerning labour market choices.

Subsequently, the ILO with educators from South Africa and the U.S. developed an entrepreneurship package taking as departure the ILO's Know About Business (KAB) programme that has been introduced in more than 50 countries.² The new programme (startUP&go) is based

² The ILO has been supporting more than 50 countries in introducing entrepreneurship education into national curriculum. See *Supporting Entrepreneurship Education – a report on the global outreach of the ILO's Know*

on experiential learning methodologies such as entrepreneurship games and business simulation exercises that, furthermore, have been fully aligned with South African curricula for business studies.³ The startUP&go package focuses on fostering entrepreneurial attitudes, qualities and competencies among learners. Current textbooks and related textbook teaching approaches do not focus on the mind-sets of young learners; do not focus on entrepreneurial qualities and on instilling enterprising attitudes and habits of minds in learners. The startUP&go package was designed to: a) reinforce textbook content by means of business games, simulations and interviews with entrepreneurs and documentaries through audio-visual materials; b) focus on the learner in both the playing of the games, but also on the reflection of learning outcomes experientially during the games, and; c) address entrepreneurial characteristics and higher order thinking skills.

The startUP&go package is implemented in the business studies course in 62 schools across the Free State province over a three-year period in 2013, 2014 and 2015. The package was first introduced in Grade 10 in 2013, in Grade 11 in 2014 and in Grade 12 in 2015. This report is the first publication in a series of reports under a quasi-experimental⁴ and longitudinal study of learners over a five-year period, which seeks to assess both short-term impact on knowledge and entrepreneurial intentions and long-term impact on labour market outcomes such as employment creation and business start-up.

This report evaluates the short-term effectiveness of startUP&go classes in changing learners' attitudes towards entrepreneurship over a relative short (9 months) period in grade 10 in 2013. Using baseline data and data from a first follow-up questionnaire⁵ in the Free State in 2013, we apply a difference-in-difference estimation technique. We conduct various placebo tests and analyse sample selection to ensure the robustness of our results.

The rest of this report is structured as follows: Section 2 gives an overview of the educational background and the design of startUP&go. Section 3 explains the methodology used in the report, focusing on statistical definitions, the difference-in-difference estimator, the evaluation and surveying design as well as the challenges arising from this impact evaluation. Section 4 contains the central analysis including descriptive statistics, an analysis of the selection into the different control groups and the difference-in-difference estimation results. Section 5 gives an interpretation of the results and concludes.

About Business programme”, International Labour Office, Geneva, 2009 and *Know About Business 2013, An Outreach Report from the ILO’s Entrepreneurship Education Programme, Geneva, 2013*

³ The Curriculum Policy Assessment Statement (CAPS) for the Business Studies course, Grades 10-12, department for basic education, Republic of South Africa, 2011

⁴ The 2015 International Labour Conference Report on *Small and medium-sized enterprises and decent and productive employment creation* defines experimental as follows: “An experiment tests an SME intervention, e.g. a training or microfinance program, by randomly assigning businesses to treatments or to a control group representing the status quo. This approach reduces the likelihood of systematic differences between treatment and control group that might affect the measured outcome and helps to credibly attribute observed positive or negative effects to the intervention. Quasi-experiments use other methods than random assignment to construct treatment and control group. Possible differences in the groups may reduce the credibility of results”, ILC 104th Session, 2015

⁵ Baseline data was collected from learners in February 2013 and the follow-up survey was undertaken in November 2013.

2. Background

2.1 Educational Background

School education in South Africa incorporates 12 years of formal schooling and school attendance is mandatory up to grade 9. The school year runs from January to December and is divided into four terms, each lasting approximately two months.

Parents have a large element of choice in choosing which school they would like to send their children to, fostering a high level of competition between schools. Schools are mainly evaluated according to the learners' scores of standardized exams (either at the national or regional level) at the end of grade 12. These exams are extremely important for university admission and the learners' future career prospects. Therefore, they play an important role in teaching and schools do everything possible to make sure learners know as much of the exam content as possible. Only 12% of learners taking this exam receive marks high enough to get into university (The Economist, 2013).

Furthermore, schools are categorized according to a quintile system that determines the level of state funding (and provision of feeding schemes) the schools will receive. The quintiles are calculated following mainly socio-economic factors of the learners and the community, the idea being to identify disadvantaged schools. The lower the quintile ranking, the more money and assistance the school receives from the government. However, there are often significant delays in updating the ranking of the schools, making some of the lower ranked schools actually better off than higher ranked ones.

Beginning in grade 10, learners not only go to school voluntarily but also need to choose which area to specialize in. The level of choice and the subjects to choose from varies from school to school, but in general learners can choose between specializations such as business studies, economics and accounting, mathematics, and science. Business studies is perceived to be the easiest elective, so learners that are better in terms of their test scores at the end of grade 9 generally do not take business studies. Since for the ranking of the schools the school-leaving exam scores in the "harder" subjects like mathematics and science are more important, teachers actively move weaker learners into business classes, also during the school year. This self-selection effect before grade 10 coupled with teachers' active intervention during grade 10 needs to be kept in mind in the further analysis.

2.2 Design of startUP&go

The programme startUP&go aims at improving and enhancing the business studies curriculum. The business studies curriculum is defined by CAPS (Curriculum Policy Assessment Statement) and focuses on the traditional areas of business in the form of "hard skills", including functions of business such as managing finances, managing cash flow and marketing. The Department of Basic Education (DBE) and the ILO made an agreement in October 2011 to introduce the new startUP&go package that would enhance CAPS with the aim of giving school leavers the necessary skills to identify and pursue business opportunities as well as the life skills needed to be employable. This aim should be achieved by fostering an entrepreneurial mind-set and intention (but also including an awareness of the risks involved) as well as creating attitudes and characteristics positive towards entrepreneurship.

Rather than introducing additional contents, startUP&go enhances CAPS and intends a deeper understanding of the same material through a learners-centred, experimental learning approach by offering entrepreneurship games, posters, social media platforms (Twitter, Facebook, YouTube), DVD's with game instruction for teachers and entrepreneurial market days, where learners practice setting up and running a business for one day. This can be seen as a shift from “hard” business skills to “softer” entrepreneurial skills. Methodologically, there is a shift in teaching away from pure repetition of business theory and concepts in text books towards a more interactive and experiential outcomes based learning approach building on instructional scaffolding.

startUP&go was introduced in the 10th grade of 62 specially selected schools in the Free State in the beginning of 2013 and was extended to grade 11 in 2014. One teacher from each school participated in a two-week training workshop in October 2012 as well as in a refresher training workshop at the beginning of 2013 before school-start in order to be familiarized with the startUP&go approach. In November 2013 a workshop to introduce teachers to grade 11 startUP&go materials was organised.⁶

To enable teachers to implement these new teaching methods, each startUP&go teacher was provided with a laptop, a projector, instructive videos and posters. The teachers also received a teacher's guide explaining the material and linking it to CAPS as well as learner's books and formal assessment guidelines of the learners' progresses.

⁶ However, this report only assess the impact of startUP&go in its first year in grade 10 in the 2013 school year.

3. Methodology

3.1 Statistical definitions

Treatment group

The treatment group is the group that receives the treatment we are interested in evaluating, in this case the startUP&go classes. Therefore learners in the treatment group are all in startUP&go schools (schools in which startUP&go was introduced) and in 10th grade, since startUP&go was only introduced in the 10th grade in school year 2013.

Control group

The control group is the group of learners that did not receive the treatment. In this evaluation, we have a multitude of control groups: learners in control schools (i.e. schools where startUP&go is not introduced) as well as learners of older cohorts in treatment schools (i.e. students that were in grade 11 and 12 in the year where startUP&go was introduced in grade 10)

Counterfactual

The counterfactual is the hypothetical evolution of the treatment group in case it had not received the treatment. Therefore it would be the optimal benchmark to which we would like to compare the treatment group. However, the real counterfactual is inherently unobservable.

Dummy variable/indicator variable

A dummy variable is a variable that takes on the value 1 for all “true” cases and the value 0 for all other cases. For example, a dummy variable for being a business student or not takes the value 1 if a learner takes business classes and the value 0 if a learner does not take business classes.

Baseline questionnaire

The baseline questionnaire is the first questionnaire administered before the introduction of the startUP&go program, in this case in February 2013 at the beginning of the 2013 school year.

Follow-up questionnaire

The follow-up questionnaires are the questionnaires administered to the same learners as the baseline questionnaires were administered to after the introduction of startUP&go. The first follow-up questionnaire was done in October 2013 and further yearly interview rounds are planned.

3.2 Difference-in-difference

How exactly has the introduction of startUP&go impacted learners in Free State schools? Which aspects of learning have startUP&go improved? To find conclusive answers to these questions, we cannot simply make a before-and-after comparison of the learners. We do not know for sure how the learners would have progressed had they not received startUP&go classes. To circumvent these and related issue we have exploited the rich data available and applied a difference-in-difference estimation technique. This section gives a brief explanation of the difference-in-difference estimator.⁷

⁷ The subsequent section explaining the econometric background is largely based on our previous work on “Non-experimental methodologies for quantitative analysis” in “A Practical Guide to Impact Assessments in Micro-insurance” (Frölich, Landmann, Olapade, Poppe, 2014).

In any impact evaluation, we are ultimately interested in making causal statements connecting a given program like startUP&go to a set of outcome factors, for example intention/willingness to start a business. The knowledge about direct causal relationships is crucial for decisions such as the expansion or introduction of similar programs.

The fundamental problem in evaluating startUP&go and any other project or intervention is the fact that we cannot observe a single person in two states at the same time. For any given learner, they are either in a school that receives startUP&go or in a school that doesn't receive startUP&go. Likewise, every learner is either a business-class student or not. Especially in the latter case, it becomes clear that *self-selection* can be a serious issue. What we mean by "self-selection" is that learners themselves decide whether or not to take business classes and this decision may be related to many other factors, among them their willingness to start a business. Business studies students may therefore be more predisposed to start a business even in the absence of any classes. Therefore a difference between these two groups cannot be fully accrued to startUP&go. We will look at direct evidence of this self-selection later on in the report.

Due to this self-selection, we need a relevant comparison group with which to analyse the effects of startUP&go. The perfect way to create this comparison group would be using randomization, that means randomly (for example using a dice) assigning learners to a treatment and control group. Randomization would allow us to easily make causal statements about the effect of introducing a given program. However, due to institutional constraints and ethical considerations this is often simply impossible. In these cases it is important to approximate a randomized experiment with statistical methods as we have done in this study.

In this specific evaluation of startUP&go, the control schools were not randomly selected (they were pre-chosen by the department of basic education in the Free State) and we therefore use a difference-in-difference methodology to be able to approximate (under certain assumptions) causal statements "as if" we had random assignment between the treatment and control groups. The difference-in-difference (DiD) estimator relies on comparing participants and non-participants before and after the treatment. For a given outcome variable, the main idea is to compare its evolution over time (a first difference) in the treatment group with the evolution of the same outcome variable in the control group (a second difference) and subtract these two differences from each other. As a result, we can identify the treatment effect since time-invariant differences in characteristics between participants and non-participants are eliminated.

Figure 1 gives a brief illustration of the DiD estimator for a hypothetical impact evaluation of the effects of a training program on the probability of starting a business. The horizontal axis denotes the time: $t=0$ is before the intervention and $t=1$ after the intervention. The blue line represents the evolution of the control group and the green line the evolution of the treatment group over time. The red line depicts how the treatment group would have evolved without any training, in other words its counterfactual evolution. Note that this counterfactual evolution is completely unobservable. In this case, the counterfactual distribution has a parallel time-trend to the control group and therefore the difference-in-difference approach gives us a correct estimate of the treatment effect: we just subtract the difference in the control group (blue line) from the difference in the treatment group (green line).

The crucial assumption to be able to use the difference-in-difference estimator is clearly the parallel trend assumption (also called common trend assumption). As we saw in the last figure, the identification of the treatment effect only works because the counterfactual evolution of the

treatment group (red line) is parallel to the control group (blue line). For this reason our DiD estimator can only control for time-invariant variables, that is variables that affect the outcome of interest but are constant over time. In the graphic, this would correspond to an upward or downward shift of the various lines.

In case the parallel trends assumption is not fulfilled, the DiD estimator yields incorrect estimates of the treatment effect. Figure 2 shows how this would result in the counterfactual evolution of the treatment group (red line) not being parallel to the evolution of the control group (blue line). Reasons for these differences in time-trends could include differential macro-economic shocks to the varying school areas.

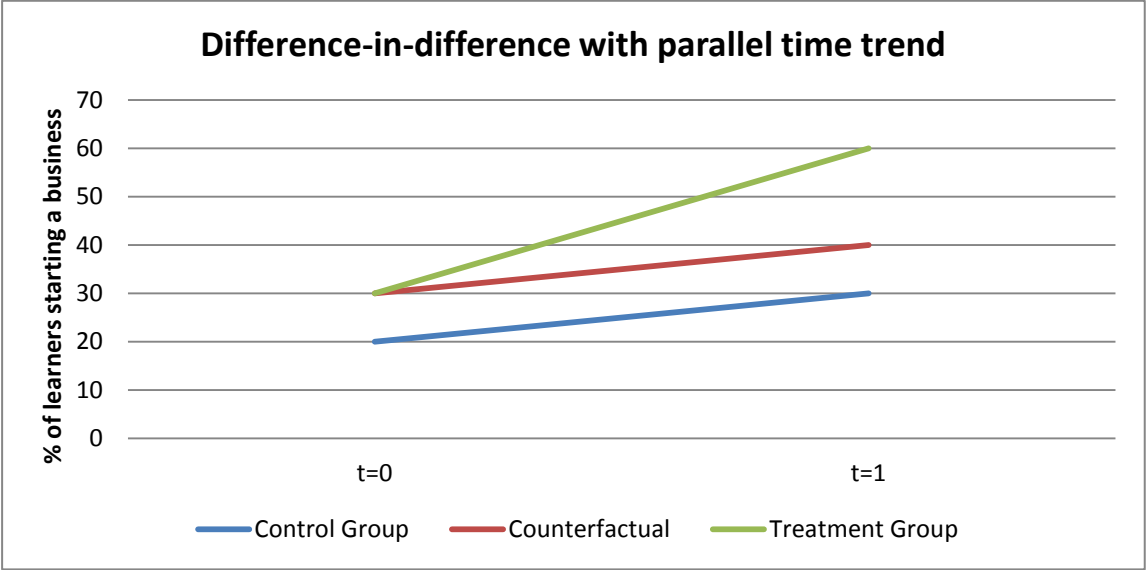


Figure 1: Difference-in-difference with parallel time trend

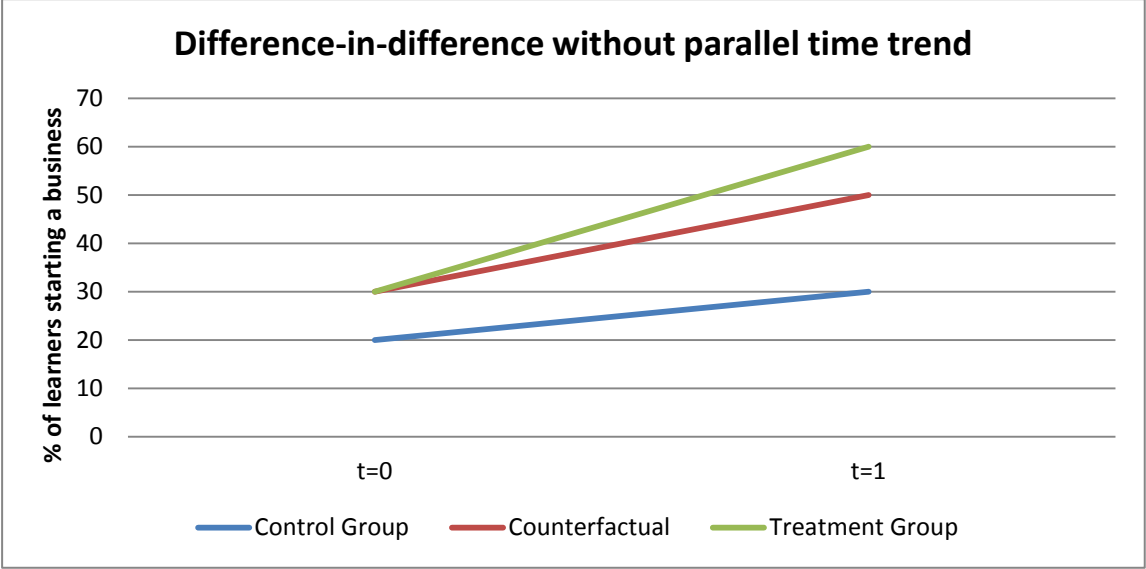


Figure 2: Difference-in-difference without parallel time trend

One way to indirectly test this parallel trends assumption is by conducting so-called “placebo” difference-in-difference estimations. These placebo DiDs are just like real DiDs, with the one exception that they estimate the effect of a non-existing program or reform. We should not be able to find any effect of this hypothetical program or reform. If we do find a treatment effect, this would shed considerable doubt on the parallel trends assumption, namely that in the absence of any reform, the treatment and control group should evolve parallel to each other.

To be able to estimate these placebo DiDs, we need additional data in the form of either more time periods or additional control groups. Please note that these placebo DiDs can never fully validate the parallel trends assumption (which is un-testable), however, they can shed light on certain aspects of the assumption and lend confidence to it being justified.

The last aspect of impact evaluation we would like to underline in this report is the difference between internal and external validity. Internal validity is the extent to which the results are credible for the population under consideration. External validity is the extent to which this sub-population is representative for the whole population of interest. In this study, we can make statements about the schools in the Free State in which startUP&go was introduced. It is obviously more difficult to make these same statements about all the schools in the Free State or all schools in South Africa. This depends on how representative the schools in our study are for these larger groups of schools and learners.

3.3 Evaluation Design and Surveying

The startUP&go programme (our treatment) was introduced in 62 schools in the Free State province. These schools were non-randomly selected by the Department of Basic Education (DBE). The official statement was that these schools were “previously disadvantaged”, i.e. schools ranking very low on the quintile system. Following the quintile ranking system often used to classify schools in South Africa, we observe treatment and control schools from the whole distribution of quintiles. However, for various political and administrative reasons, the quintile rankings of a given school can be quite persistent and do not necessarily have to correspond to the actual circumstances at the school.

To be able to assess the impact of startUP&go, it was decided to have in total 10 control schools. Two control schools were selected in each of the five district municipalities in the Free State (Xhariep, Motheo, Fezile Dabi, Lejweleputswa and Thabo Mofutsanyane). These control schools were selected according to two criteria: geographical proximity to one of the treatment schools and similar quintile ranking to this nearest treatment school. By this way, it was assured that the control schools share the geographical background and conditions of the nearest treatment school. One consequence of this non-random selection process might possibly be that all control schools will likely be in relatively densely populated areas, since there have to be at least two schools close by.

The baseline survey was conducted at the beginning of the school year 2013 (February) before the introduction of startUP&go in the business studies course.

- In the 62 treatment schools, all grade 10 learners (business studies and non- business studies learners) were interviewed. Furthermore, in treatment schools grade 11 and 12 business studies learners were also interviewed (these did not receive the treatment).

- In the control schools, all grade 10-12 business studies learners were interviewed. The same learners were all interviewed again just before the end of the school year 2013 (October 2013).

Yearly follow-up surveys are planned until the 2013 grade 10 learners leave secondary school by the end of 2015. A tracking system for keeping in touch with the young adults after they leave school has been put in place by giving the learners an incentive (possibility to win iPads) to register their contact details (parent's address, phone number, email) on the startUP&go website. It remains to be seen how many learners register and how best to contact them, since only a few number of the learners seem to have email addresses, for example. The next grade 10 (which started in 2014) is not surveyed, but they will receive startUP&go classes. Apart from surveying the learners, a questionnaire for the teachers was also administered and school grades in English, maths and EMS (Economics and Management Sciences) of all learners from when they were in grade 9 was gathered from school register data. Please also refer to table 1 which gives an overview of the available data and the number of valid observations in each category.

On top of this quantitative survey-based analysis, the ILO is also conducting a rigorous monitoring & evaluation (M&E) process. As part of this M&E process, all treatment schools receive a visit once a year which include interviews with the teachers and learners as well as classroom observations. Detailed M&E reports are written.

3.4 Challenges

3.4.1 General points

Most important of all it needs to be pointed out that it is quite difficult to measure the success of an entrepreneurship education program like startUP&go over the relatively short period, which this report covers. startUP&go was introduced in February 2013 and this first assessment took place in early November of the same year. On top of this come the challenges that many teachers faced in fully adopting the experiential learning methodology.⁸ In addition to short-term change in entrepreneurial intentions relevant long term outcomes are number of new jobs created, number of new businesses created and improved employability of young people. However, we can only observe these outcomes after the students have left secondary school. Therefore it is important to stay in touch with the learners and survey them after leaving high school. This is expected to work thanks to the on-going ILO project through which funds will be available for these assessments until 2017.

The effects of good entrepreneurship classes on enterprise creation and ambitions are also unclear from a theoretical perspective. On the one hand, entrepreneurship classes impart valuable entrepreneurial competencies, business skills and people realize more business opportunities. On the other hand, participants become more aware of the difficulties and risks involved and could be deterred from engaging in entrepreneurial activity. This could also lead to a possible selection effect: only those people with the right attitude and skill set decide to continue their entrepreneurial activity after participating in the classes (von Graevenitz, Harhoff and Weber 2011).

⁸ M&E visits to all schools identified this challenge in the 2nd term already and as a consequence the department of basic education and the ILO have been undertaking a number of refresher trainings and has focused even stronger on practice teachings by teachers when they were trained in the grade 11 materials.

Finally, the effectiveness of entrepreneurship training programs could be tied to complementary institutions like the availability of credit or continued support after secondary school through mentoring programs. This is a further point where it could be interesting to introduce additional support programs to the learners after leaving secondary school.

3.4.2 Survey, implementation and interpretation

In October 2013, the evaluation team visited three schools in the Free State to observe the surveying work and conduct extensive interviews with the enumerators, startUP&go teachers, school headmasters and ILO staff. In general, all stakeholders had very positive feedback on startUP&go and its impact on the learners. The learners especially were highly enthusiastic about the program. In the following, we will focus on those difficulties and challenges that arose from these discussions which should be taken into account when observing the results of this evaluation.

From the reports of the staff of YoAfrica, the surveying firm, the degree of cooperation in the survey process varied substantially by school, from some schools refusing access to the survey team and others helping in every way possible. Especially the headmasters and school administration of control schools frequently impeded proper work of the survey team since they were unhappy about not being part of startUP&go and not having received laptops for teachers and educational materials.

The feedback from most people involved in the startUP&go programme shows that both teachers and learners are enthusiastic about the programme but that proper implementation in grade 10 was a challenge. In some schools the educational material was received late or the teacher that received the startUP&go training was promoted or moved to a different school wherefore a teacher who had not been trained in startUP&go had to find a way to make best use of the materials. Furthermore, at the time of surveying some teachers had not fully embraced the experiential, learner-centred approach of startUP&go. This is in line with the results of the M&E process, which shows heterogeneity in the level of implementation of startUP&go. Some teachers are doing well and have welcomed the innovative learning approach into the class room whereas others are still holding on to the conventional textbook approach, which is less demanding on teachers' adaptability. The teachers with whom we spoke to during the field survey expect the startUP&go implementation to improve in the second year of implementation, in grade 11 in 2014. For our analysis, these teething challenges in implementation probably cause the true impact of the program to be underestimated for the first year. Therefore we can consider the estimates as lower bounds of the true impact of the program.

One major challenge in administering the questionnaires was the low level of English proficiency among learners. Sadly, some of the more complex questions to assess entrepreneurial aptitudes of learners (preference and lottery questions) were not fully understood by the learners and therefore could not be used in the statistical analysis. However, translating the questionnaire was not an option since neither Afrikaans nor Sesotho are spoken everywhere and the enumerators also only speak some of the languages. Since the business language in South Africa is primarily English, the startUP&go material is only printed in English and in the majority of schools classes are conducted in English wherefore a decision was made to administer the questionnaire in English. Problems with the English language are a general issue in the schools and one of the

considerations during the startUP&go design process was to have exercises that improve the learners' English proficiency.⁹

Further difficulties that arose in the survey process include learners having to be prompted to complete the questionnaire and some learners seeming to think that the survey was an exam with "correct" answers.

A further challenge to the analysis is sample attrition: Total class size and learners present at a given point in time often differed substantially. This was particularly the case for grade 12 where many learners were at home or at "study camps" preparing for their final exams. This could induce a bias if learners are missing dependent on third factors that are also related to the outcomes.

Moreover, there could be fear of some form of spill overs between classes. Some teachers reported using the startUP&go materials not only for the 10th grade but also for the 11th and 12th grade. Teachers also frequently transfer students between business classes and other classes depending on their academic achievements as business classes are generally considered to be less difficult.

⁹ startUP&go includes reflective written exercises in the Learner's Book and Learner's Journal.

4. Analysis

4.1 Descriptives

In order to attain a better idea about the background of the learners sampled in this study, we present a few descriptive tables. As described in Section 3.3, this quantitative impact evaluation is based on a baseline survey in February 2013 and a follow-up survey in October 2013. Summing across the two surveys, we have more than 33,000 observations with complete information.

Table 1 gives an overview of the sample sizes with complete information¹⁰, disaggregated by grade, treatment status (whether or not they received startUP&go classes), whether they are business students or not and whether the observation is from the baseline or follow-up survey. Furthermore, each cell is divided into female and male learners with their respective frequencies and proportions. We can clearly see that throughout the sample, we have a much higher sample size in treatment schools (here all 60 schools were sampled) than in control schools (10 sampled schools). Moreover, the number of female learners is consistently higher than the number of male learners. There does not seem to be a systematic difference in the proportions of male and female learners across treatment status or baseline / follow-up survey.

Table 1: Sample sizes by school grades for observations with complete information

Grade 10 (startUP&go, non-startUP&go and business studies students)				
	startUP&go student	baseline	follow-up	Total
Treatment schools	no	4,825	4,399	9,224
	female	2,559 (53%)	2,387 (54%);	4,946 (54%);
	male	2,266 (47%)	2,012 (46%)	4,278 (46%)
	yes	5,600	4,891	10,491
	female	3,133 (56%);	2,776 (57%);	5,909 (56%);
	male	2,467 (44%)	2,115 (43%)	4,582 (44%)
Total	10,425	9,290	19,715	
Control schools	Business studies student	694	726	1,420
	female	359 (52%);	385 (53%);	744 (52%);
	male	335 (48%)	341 (47%)	676 (48%)

Grade 11 Business studies students

	baseline	follow-up	Total
Treatment schools	2,687	2,645	5,332
female	1,541 (57%);	1,497 (57%);	3,038 (57%);
male	1,146 (43%)	1,148 (43%)	2,294 (43%)
Control schools	495	443	938

¹⁰ Measured by whether we have information on one of the most important outcome variables, the answer to the question “Do you think that starting a business would be a good career choice for you”?

female	267 (54%);	248 (56%);	515 (55%);
male	228 (46%)	195 (44%)	423 (45%)
Total	3,182	3,088	6,270

Grade 12 Business studies students

	baseline	follow-up	Total
Treatment schools	2,546	2,835	5,381
female	1,462 (57%);	1,623 (57%);	3,085 (57%);
Male	1,084 (43%)	1,212 (43%)	2,296 (43%)
Control schools	359	323	682
female	205 (57%);	189 (59%);	394 (58%);
male	154 (43%)	134 (41%)	288 (42%)
Total	2,905	3,158	6,063

Note: The effective sample size might be considerably lower if the same learner was not present at both points in time.

Table 2 gives an overview of selected summary statistics at baseline, looking at gender and average age, disaggregated by school grade and treatment status. It is interesting to see that the average and median ages are relatively high, with the median age being 17, 18 and 19 in grades 10, 11 and 12 respectively.

Table 2: Summary Statistics

Grade	Schools	Female	Male	Average Age	Number of Observations
10	Treatment	54.6%	45.4%	17.24	10,425
	Control	51.7%	48.3%	17.67	694
11	Treatment	57.4%	42.6%	18.27	2687
	Control	53.9%	46.1%	18.64	495
12	Treatment	57.4%	42.6%	19.20	2,546
	Control	57.1%	42.9%	19.58	359

Note: For this table we considered observations at baseline with complete information on outcome variables. The gender variables show the respective percentage and frequency.

Furthermore, the sample of schools is well-distributed across the Free State in South Africa, with schools being sampled in the districts Fezile Dabi, Thabo Mofutsanyane, Motheo, Lejweleputswa and Xhariep. Table 3 provides an overview of the sample by district. In each district, two controls schools were chosen and sampled along with all the treatment schools.

Table 3: Sample Overview by Districts

District	Treatment Group				Control Group			
	Total # of Schools	Total # of Learners	Female	Male	Total # of Schools	Total # of Learners	Female	Male
Fezile Dabi	16	3,589	2,039 56.8%	1,550 43.2%	2	381	216 56.7%	165 43.0%
Thabo Mofutsanyane	11	2,835	1,498 52.8%	1,337 47.2%	2	355	181 51.0%	174 49.0%
Motheo	13	3,933	2,146 54.6%	1,787 45.4%	2	376	176 46.8%	200 53.0%
Lejweleputswa	13	4,057	2,360 58.2%	1,697 41.8%	2	163	107 65.6%	56 34.0%
Xhariep	7	1,244	652 52.4%	592 47.6%	2	273	151 55.3%	122 45.0%

Note: For this table we considered observations at baseline with complete information on outcome variables.

The rest of this section provides descriptive graphics on the impact of startUP&go by providing simple comparisons. As described in the methodology section above, however, these purely descriptive graphs cannot be taken as direct evidence of the causal effect of startUP&go.

Where available, these descriptive graphics display the evolution of selected indicators of grade 10 business studies learners before and after the introduction of startUP&go in treatment schools. Values before the introduction are denoted by “Baseline” and after the introduction by “Follow-Up”. In case we only have data on the period after the introduction of startUP&go, we have compiled extensive statistics comparing the treatment and control groups to each other. In these cases we have looked at 10th grade business studies learners in treatment schools (denoted by “Treatment”) and compared these to 10th grade business studies learners in control schools (denoted by “Control”).

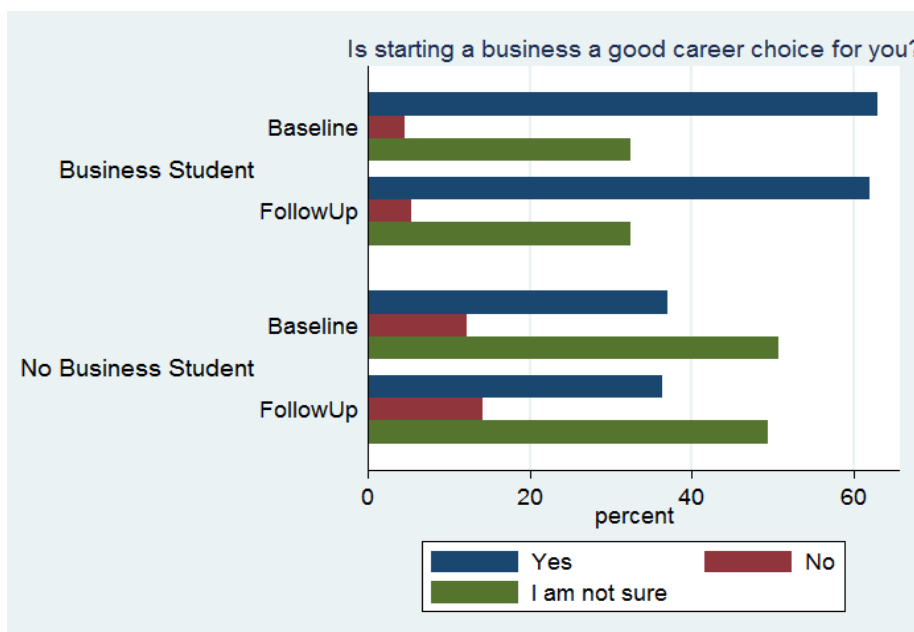


Figure 3: Do you think that starting a business would be a good career choice for you?

Figure 3 and Figure 4 depict the answer to the question “Do you think that starting a business would be a good career choice for you?” Learners had the possibility to answer with yes, no, or indicate that they are unsure. The pictures are further classified into business studies learners and non-business studies learners as well as treatment and control group. The majority of students (above 60% of the business studies students) indeed thought that starting a business would be a good career choice for them. It is reassuring to see that this number is considerably smaller for non-business studies students. When comparing the baseline to follow-up values we cannot see a clear trend in the answering behaviour, however, this will change when we look at this variable in our difference-in-difference estimation.

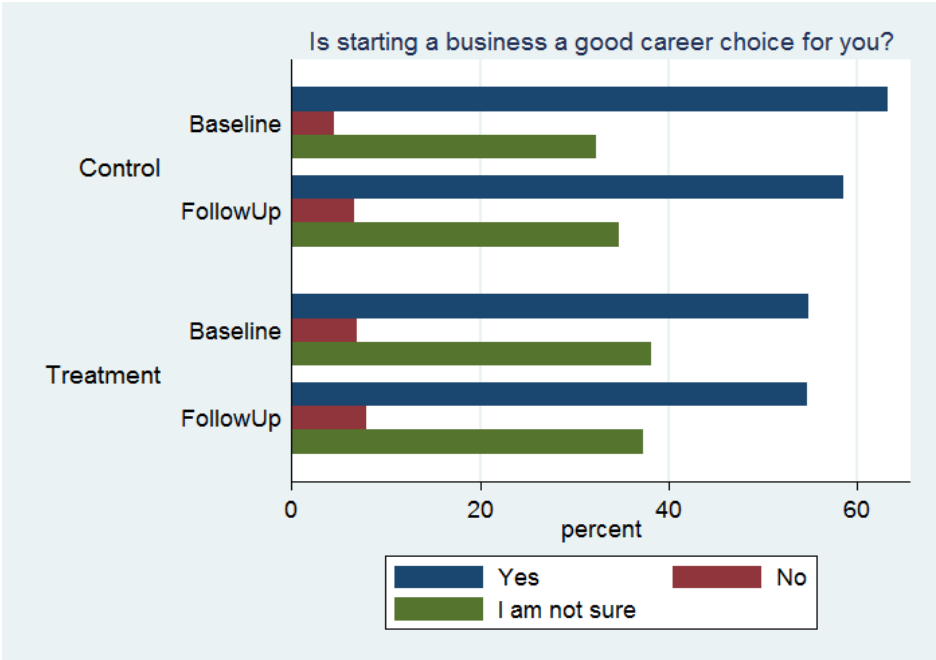


Figure 4: Do you think that starting a business would be a good career choice for you?

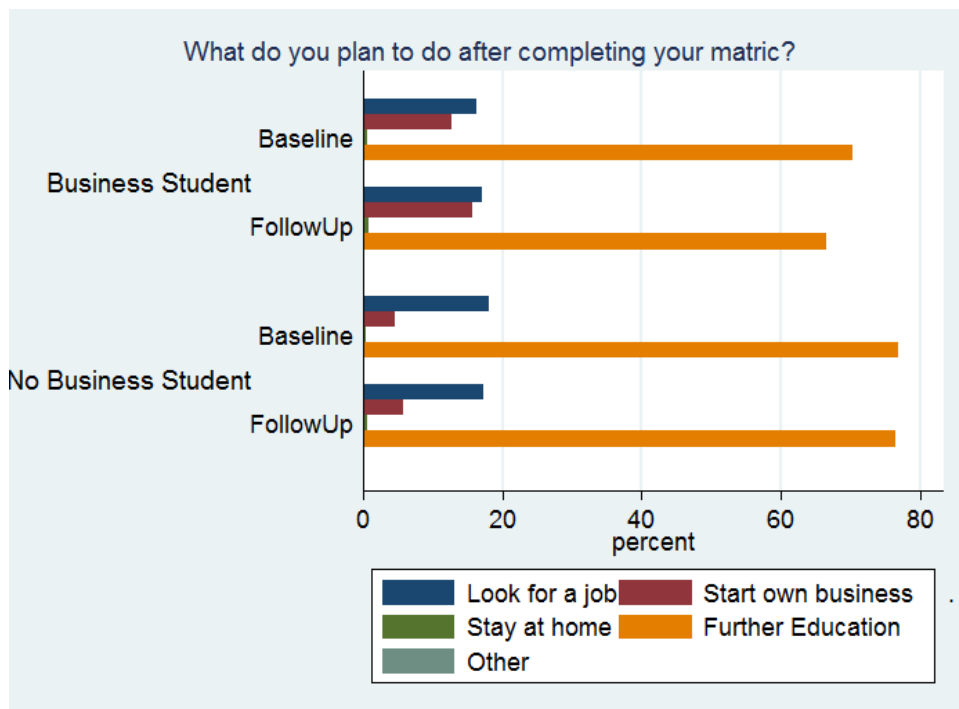


Figure 5: What do you plan to do after completing your matric?

Although many learners believe that starting a business would be a good career choice for them, most prefer to undertake further education right after finishing secondary school. This is confirmed in Figure 5, where learners chose from looking for a job, starting their own business, going for further education or staying at home as possible plans after finishing their matric. The number of learners wanting to start their own business increased over time for both business and non-business students. Reassuringly, business studies learners seem to be more inclined towards starting their own businesses than non-business studies learners.

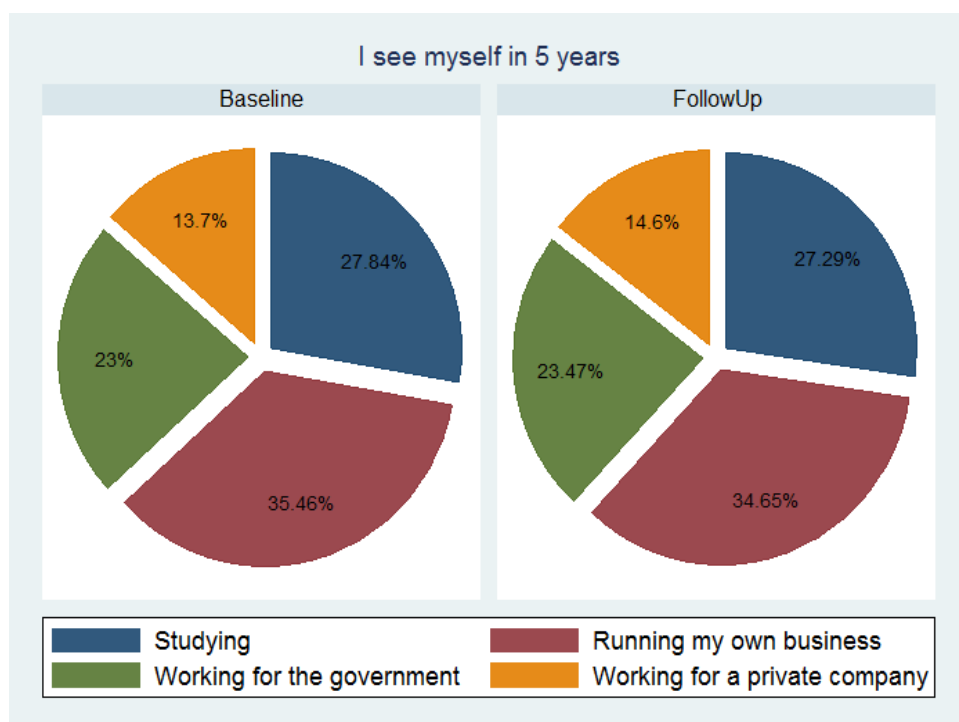


Figure 6: Where do you see yourself in 5 years' time?

Even though most learners plan to continue further education, in five years' time the majority sees themselves running their own businesses. In Figure 6 we can see that this proportion stays almost unchanged at around 35%. Other popular options, in descending order, include studying, working for the government or working for a private company.

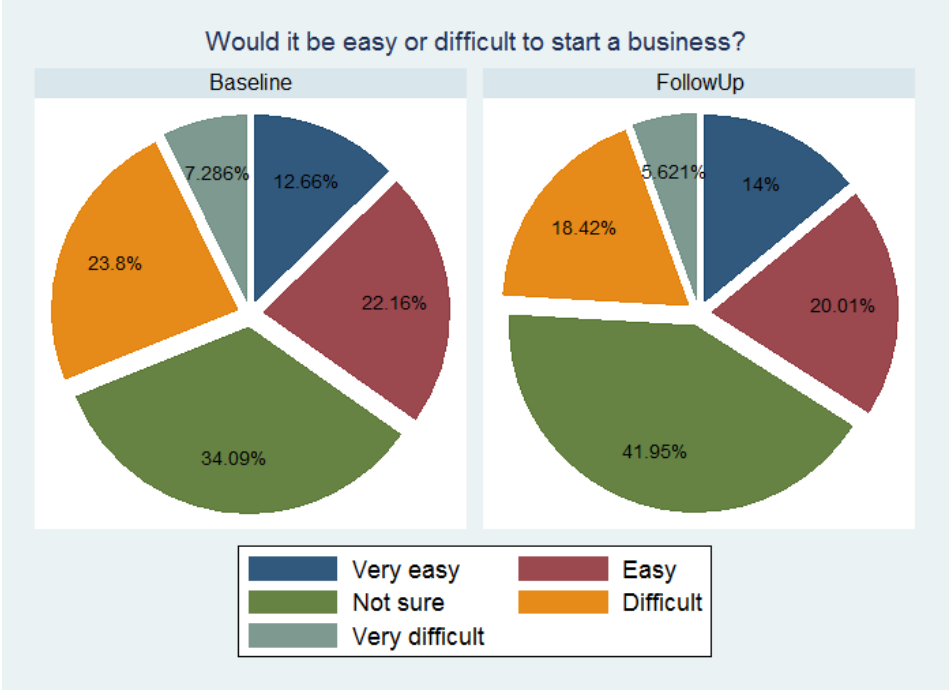


Figure 7: In your opinion, how easy/difficult would it be for you to start a business?

When asked to report the difficulty of starting their own business into five categories ranging from “very easy” to “very difficult”, most learners deemed themselves as unsure. Figure 7 shows that when comparing the baseline to the follow-up, the proportion of learners deeming the start of their own business as “very difficult” and “difficult” both decline over time. This decline is accompanied by a surge in learners being unsure about the difficulties of starting their own business.

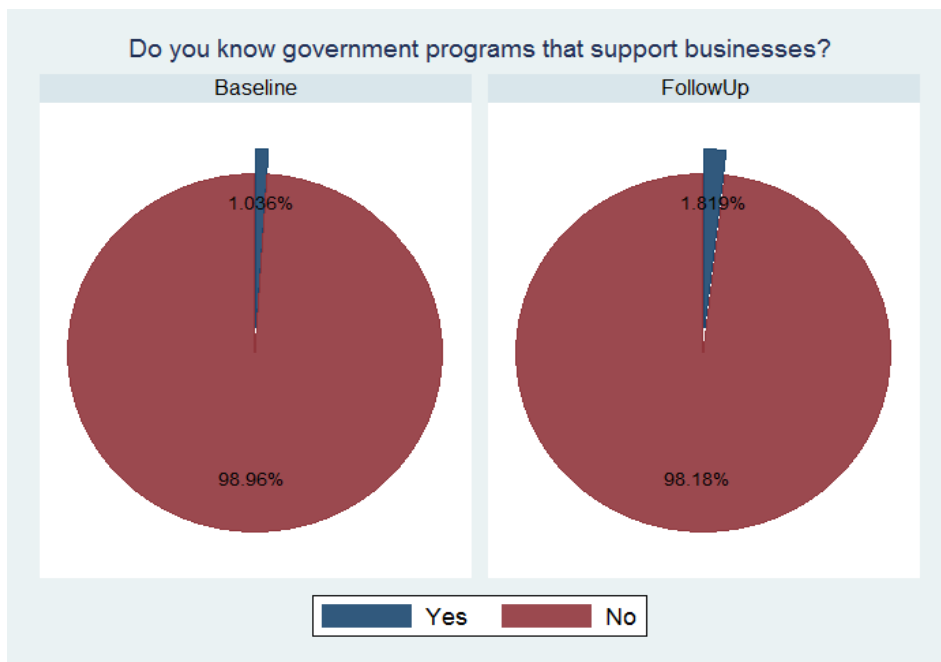


Figure 8: Do you know about any government programs that support businesses in your area?

An astonishing low number of learners know about government programs that support businesses. The percentage slightly increased over time from 1% to 1.8%, as can be seen in Figure 8. This low knowledge about government programs does not seem to deter learners from starting their own businesses. In Figure 9 we see that at baseline, around 60% of learners were starting a business either by themselves or with others. This share even increased to 68% after the introduction of startUP&go.

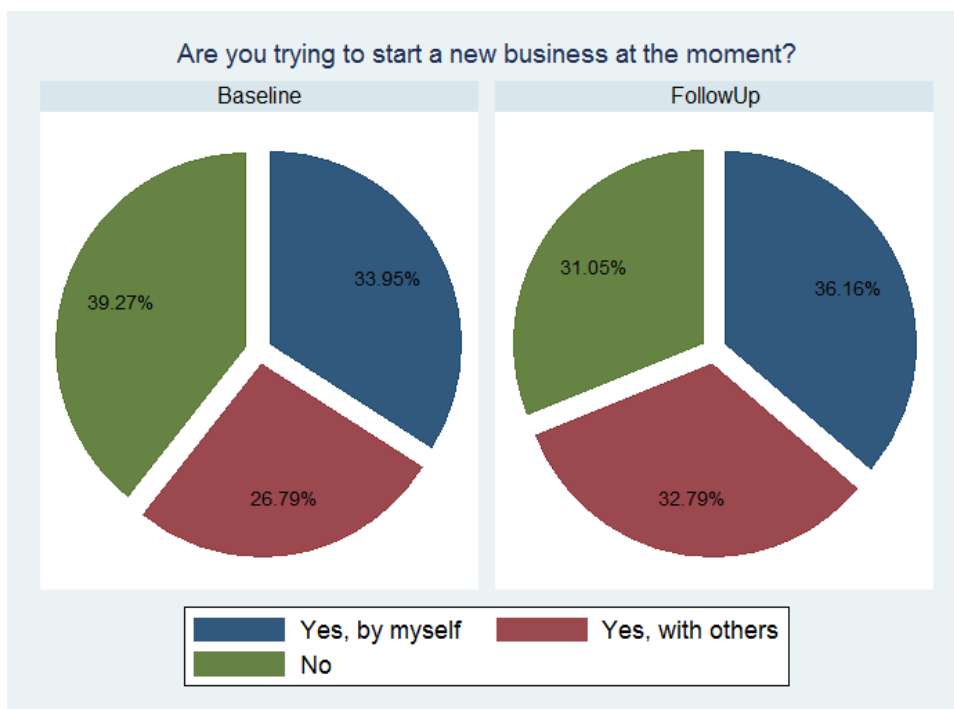


Figure 9: Are you trying to start a new business at the moment?

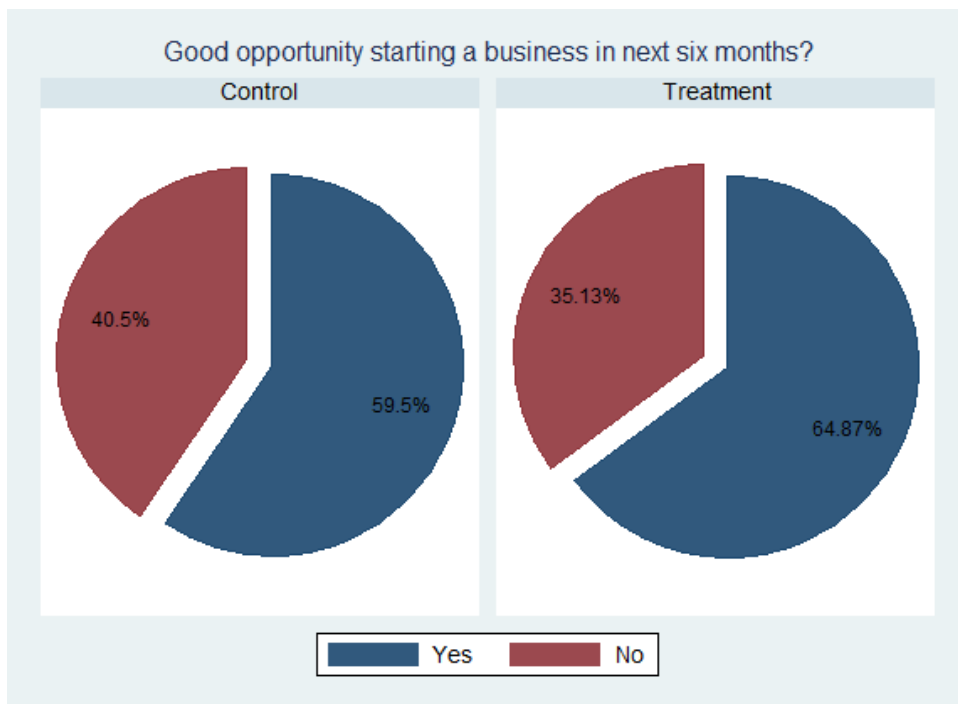


Figure 10: In the next six months, will there be good opportunities for starting a business in the area where you live?

When asked about the opportunities for starting a business in the area where they live, around 60% of business studies learners in control schools believed there were good opportunities. In treatment schools this proportion was higher at almost 65% (Figure 10).

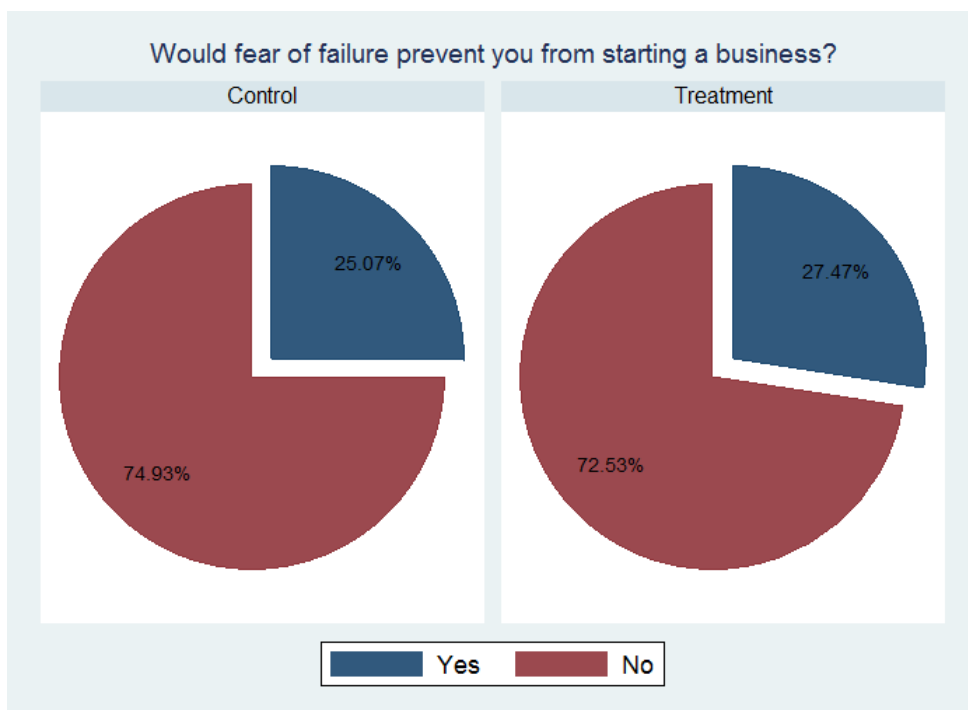


Figure 11: Would fear of failure prevent you from starting a business?

Fear of failure does not seem to hinder business creation for most learners. From Figure 11 we see that only 25% of learners in control schools think that fear of failure would prevent them from starting a business and this proportion is slightly higher at 27% in treatment schools.

In Figure 12 we can observe the answers to the question “who are the most respected in your country?” Learners were asked to rank and select the top three from a range of occupations including artists, athletes, business owners, directors of a company, charity workers, doctors, lawyers, politicians, religious leaders and teachers/academics. Around 12% of business studies learners ranked business owners as first in control schools, and this number was almost identical in treatment schools. The majority of learners in both treatment and control schools, however, did not include business owners in their top three choices.

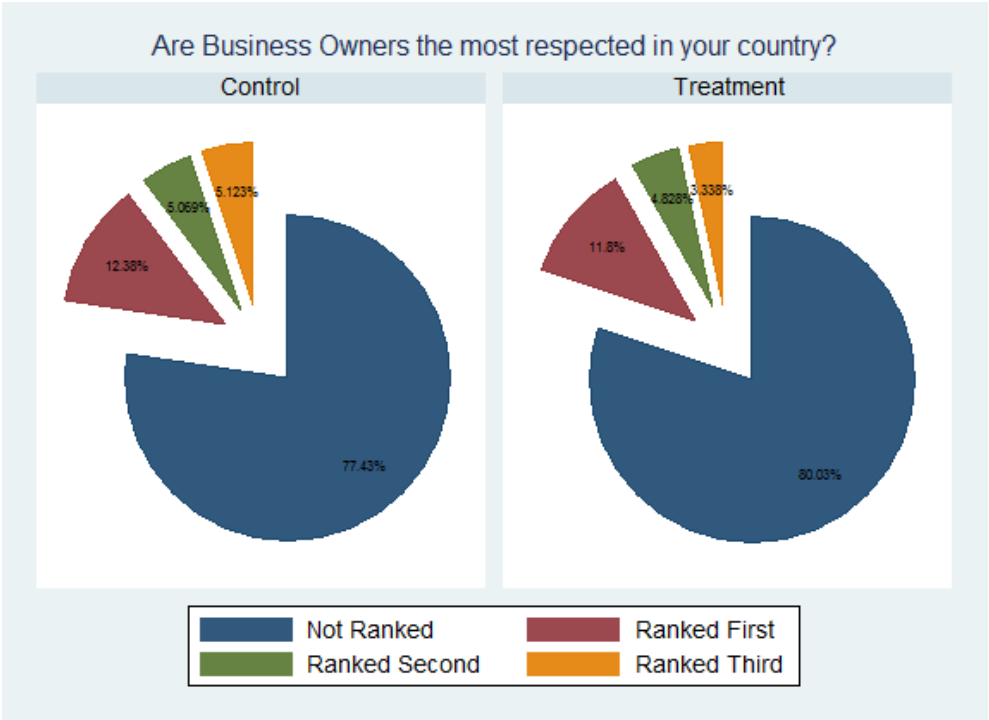


Figure 12: In your opinion, who are most respected in your country?

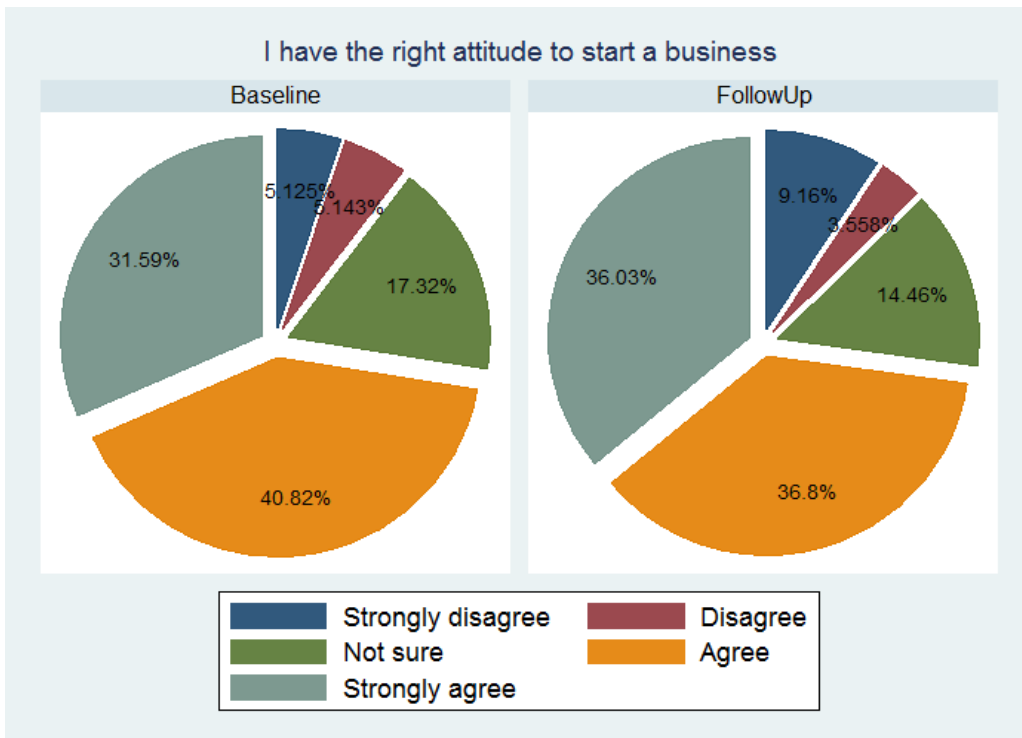


Figure 13: Attitude

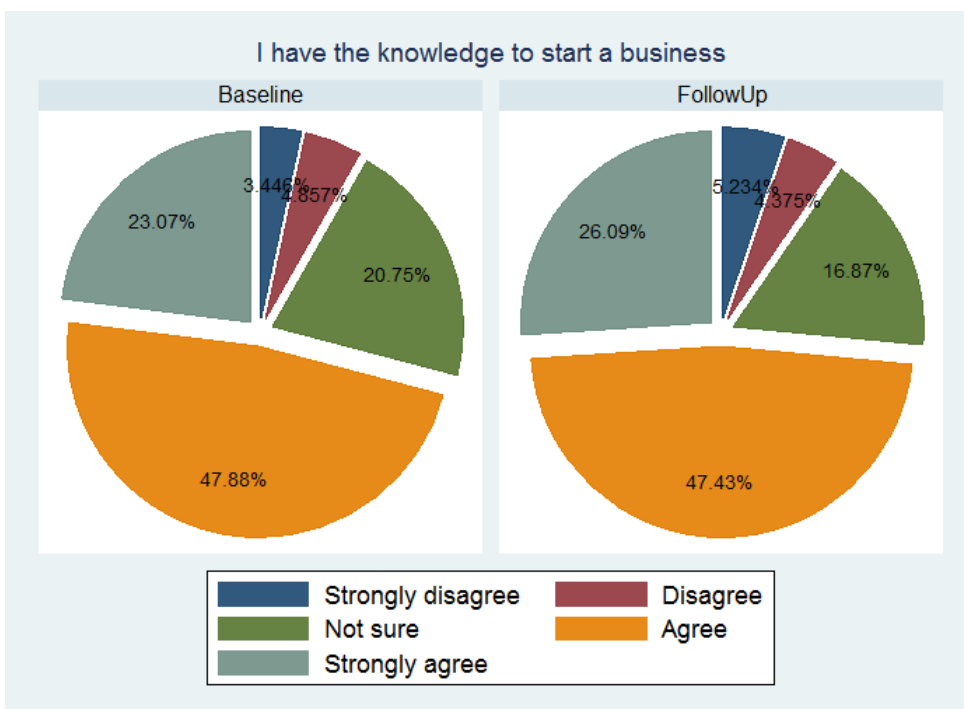


Figure 14: Knowledge

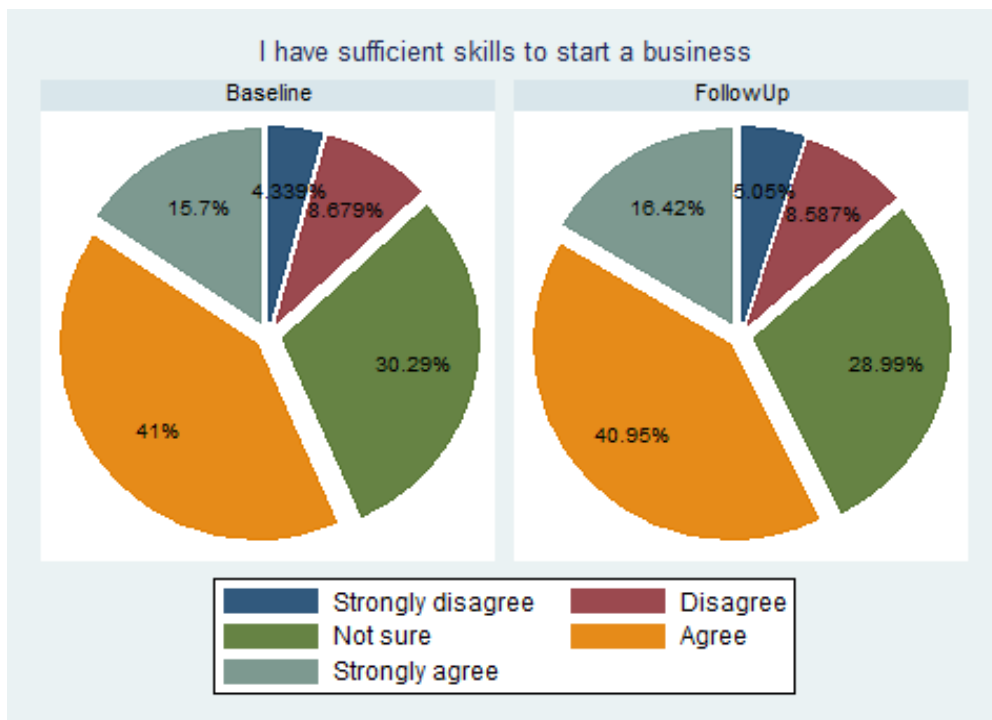


Figure 15: Skills

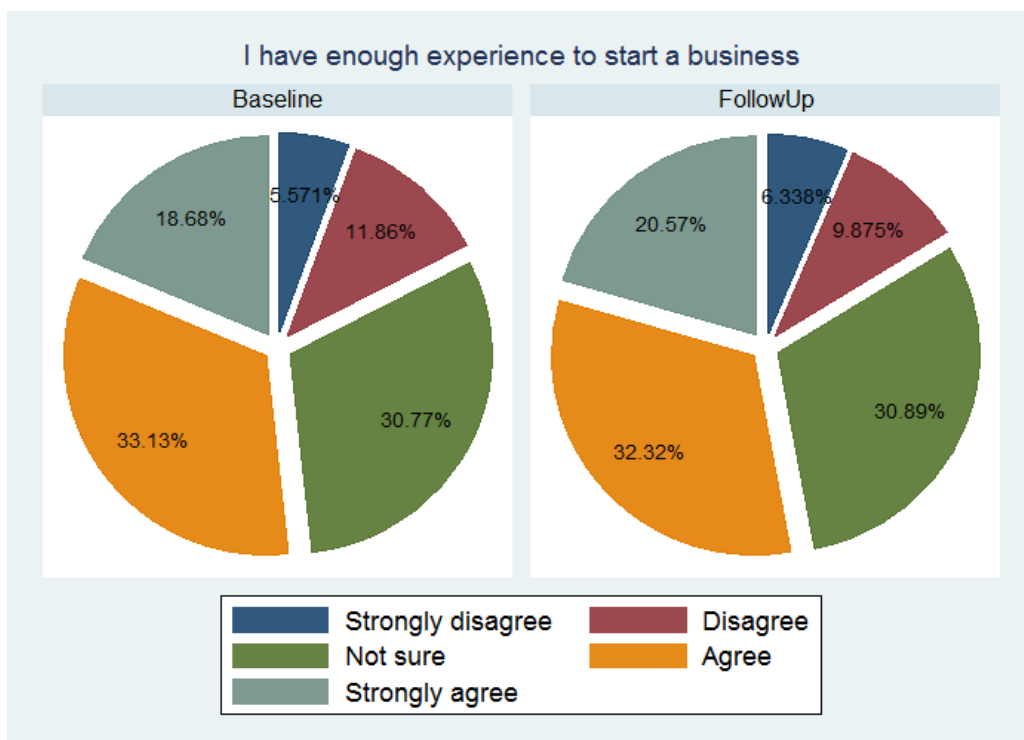


Figure 16: Experience

We further asked learners whether they agree with the statements of having the right attitude, knowledge, skills and experience to start a business. Figure 13 to Figure 16 depict the answers to these questions. In general, there does not seem to be a large change in beliefs between baseline and follow-up. Reassuringly, the proportion of learners that agree strongly with the four qualities always increases slightly between baseline and follow-up.

4.2 Selection

The descriptive graphs above cannot be taken as direct evidence of the impact of startUP&go since the learners partly self-select themselves into the different groups. This holds especially for learners choosing whether to take business classes or not. This section explores these selection mechanisms and quantifies the differences on a range of individual characteristics.

Table 4 reports the differences in a set of individual characteristics between business and non-business students. These individual characteristics include grade 9 school marks, measures of personality traits, year of birth, whether close family members owned a business and whether the learners are working in that business. In Table 5, we report the differences between startUP&go schools and control schools for the same individual characteristics except for grade 9 school marks, which were not available for the control schools. The scores for the five personality traits (extraversion, agreeableness, conscientiousness, emotional stability and openness) are constructed from questions in the first follow-up questionnaire following Gosling et al. (2003). Table A3 in the appendix gives an overview of the construction of scores used in this report.

Table 4: Analysis of systematic differences between grade 10 business studies learners versus grade 10 non-business studies learners (both 1st follow-up and startUP&go schools). Pre-treatment school grades and continuous scores on personality traits constructed from 1st follow-up questionnaire following Gosling et al. (2003). Standard Errors clustered at the school level.

	difference		SE	N
Grade 9 English Marks	-1.25		3.198	1045
Grade 9 EMS Marks	-1.646		2.254	1046
Grade 9 maths Marks	-3.234	*	1.865	1041
Extraversion	0.066		0.042	9290
Agreeableness	-0.134	***	0.042	9290
Conscientiousness	-0.059		0.059	9291
Emotional stability	-0.046		0.047	9291
Openness	0.101	*	0.06	9290
Gender	0.022	*	0.013	13308
Year of birth	-0.33	***	0.081	13308
Do any of your close family members own a business?	0.036	*	0.018	9290
Are you working in this business?	0.076	***	0.016	3729

Significant with respect to 10% (*), 5% (**) and 1% (***) significance level, respectively.

Table 5: Analysis of systematic differences between grade 10 business studies learners in startUP&go schools versus grade 10 business studies learners in control schools (both first follow-up). Standard Errors clustered at the school level.

	difference	SE	N
Extraversion	0.149	** 0.057	5617
Agreeableness	0.017	0.084	5617
Conscientiousness	0.056	0.131	5618
Emotional stability	0.005	0.072	5618
Openness	0.165	0.122	5617
Gender	0.026	0.026	7783
Year of birth	0.113	0.222	7783
Do any of your close family members own a business?	0.078	* 0.042	5617
Are you working in this business?	-0.044	0.034	2295

Business students show a significantly smaller score on the agreeableness scale than non-business students and are more likely to be working in a family business. Learners in startUP&go schools are significantly more extroverted than learners in the control schools. In interpreting these differences it must be emphasized that grade 9 school marks were only available for 1045 out of 9291 learners, thereby increasing the standard errors. Many learners also had difficulties understanding the 10 questions that were used to devise the personality traits.

We report simple differences in mean primary outcome variables in Tables A1 and A2 in the appendix. However, we refrain from interpreting these differences as the results of startUP&go due to the sample selection problems mentioned above. For example we find significant differences between business studies and non-business studies learners (in table difference C) in startUP&go schools with respect to knowledge in business (marketing, management, financing, etc.). However, this seems to be clearly resulting from the fact that those studying business should have more knowledge in these areas independent of the program. Similarly we find that after grade 10 business studies learners in startUP&go schools (difference A) have more knowledge in business at the end of the year than at the beginning. This is also expected since knowledge should increase over time in any case.

4.3 Difference-in-difference Estimation

In order to deal with the sample selection problems mentioned above, the rest of this report focuses on using Difference-in-Difference (DiD) estimates to measure the effect of introducing startUP&go in the Free State. As explained in detail in the section on the methodology, a DiD estimation mainly compares the evolution of an outcome variable over time (a first difference) in the treatment group with the evolution of the same outcome variable in the control group (a second difference) and subtracts these two differences from each other. We need to assume that

without receiving startUP&go, the learners that did receive startUP&go would have evolved in the same way as learners who did not receive it (the so called “parallel trends” assumption)¹¹.

The following analysis will use various cohorts of “control learners” to construct the DiD estimates. Due to the richness of the data, we have three different groups of control learners available:

- A. Business studies learners at the beginning of grade 10 (baseline) in startUP&go schools
- B. Business studies learners at the end of grade 10 (1st Follow-up) in control schools
- C. Non-business studies learners at the end of grade 10 (1st Follow-up) in startUP&go schools

These three control groups can be combined to create the following two DiD estimates:

- DiD A:**
 - 1st difference: Grade 10 business studies learners in first follow-up versus baseline in startUP&go schools
 - 2nd difference: Grade 10 non- business studies learners in first follow-up versus baseline in startUP&go schools
- DiD B:**
 - 1st difference: Grade 10 business studies learners in first follow-up versus baseline in startUP&go schools
 - 2nd difference: Grade 10 business studies learners in first follow-up versus baseline in control schools

DiD A uses non-business studies learners in startUP&go treatment schools as a control group and DiD B uses business studies learners in control schools as a control group.

To further validate our results, we have also constructed three “placebo” difference-in-difference estimates. With these placebo DiDs we can indirectly test our parallel trend assumption, as explained in detail in the section on methodological issues. Since we have data on grade 11 and grade 12 learners, we can construct the same DiD B as above for the 11th and 12th grade. We will see below that the results are in general as expected: the 11th and 12th grade did not receive startUP&go and therefore we find no (or only very few) significant effects of introducing startUP&go. Moreover, we construct a “cross groups” placebo DiD as follows:

- 1st difference: Grade 10 business studies learners in first follow-up versus baseline in control schools
- 2nd difference: Grade 10 non- business studies learners in first follow-up versus baseline in startUP&go schools.

Here it is just as in the first two placebo DiDs: No one in this sample received startUP&go classes and therefore we should not be able to measure any effect. We will see this confirmed below.

Table 6: Difference-in-Difference estimates

	DID A	SE	DID B	SE	Placebo DiD B Grade 11	SE	Placebo DiD B Grade 12	SE	Placebo DiD Cross groups	SE	
What do you plan to do	0.04	***	0.01	-0.03	0.04	-0.03	0.03	-0.05	0.06	-0.07	0.04

¹¹ For a detailed discussion of these issues and the methods used, please see the section on methodology.

after completing your matric? "Start my own business" vs. rest												
What do you plan to do after completing your matric? "Go for further education" vs. rest	-0.02	0.02	0.01	0.06	-0.02	0.04	0.02	0.04	0.03			0.06
Do you think that starting a business would be a good career choice for you? Omitting "not sure"	0.04	**	0.02	0.06	*	0.03	-0.01	0.04	0	0.04	0.03	0.03
In your opinion, how easy/difficult would it be for you to start a business?	0.01	0.04	-0.03	0.08	-0.15	**	0.07	-0.11	0.09	-0.04		0.08
Are you trying to start a new business at the moment?	0.01	0.01	-0.04	0.03	0.04	0.03	-0.02	0.04	-0.05	*		0.03
Do you know about any government programs that support businesses in your area?	0	0.01	-0.01	0.01	-0.01	0.02	-0.03	*	0.02	-0.01	**	0.01
Describe your knowledge in: General management	0.01	0.02	0.03	0.04	-0.08	0.06	-0.08	0.07	0.02			0.03
Describe your knowledge in: Purchasing	0.02	*	0.01	0.06	*	0.03	-0.04	0.05	0.01	0.05	0.04	0.03
Describe your knowledge in: Production	0.03	0.02	0.02	0.04	0.02	0.06	0	0.05	0			0.04
Describe your knowledge in: Marketing	0.07	***	0.02	0.04	0.05	0.01	0.08	0.06	0.06	-0.03		0.05
Describe your knowledge in: Public relations	0.01	0.02	0.03	0.03	-0.04	0.04	0.04	0.04	0.02			0.03
Describe your knowledge in: Human resources	0.02	0.01	0.01	0.04	0	0.06	0.12	*	0.07	-0.01		0.04
Describe your knowledge in: Administration	0	0.02	0.02	0.03	-0.01	0.04	0.09	0.06	0.02			0.03
Describe your knowledge in: Financing	0.05	***	0.02	0.04	0.04	-0.01	0.07	-0.01	0.1	-0.01		0.04
I have the right attitude to start a business	0.07	0.04	0.06	0.1	0.17	0.13	0.01	0.17	-0.01			0.1
I have the knowledge to start a business	0.15	***	0.03	0	0.04	0.04	0.09	0	0.09	-0.15	***	0.04
I have sufficient skills	0.1	***	0.03	0.1	*	0.06	0	0.1	-0.07	0.09	0.01	0.06
I have enough experience to start a business	0.12	***	0.04	0.04	0.06	0.01	0.1	-0.16	0.12	-0.08		0.06
Where do you see yourself in 5 years' time? Collapsed into binary ("running my own business" vs. rest)	0.01	0.01	-0.03	0.04	-0.05	0.03	-0.08	0.06	-0.04			0.04

What type of employment would you like to be in? "for myself in my own business" ranked 1	0.03	0.02	0.08	**	0.03	-0.05	0.06	0	0.09	0.06	*	0.03
What type of employment would you like to be in? "for myself in my own business" among best 3	0.02	0.01	0.03		0.05	0	0.03	0.02	0.05	0.01		0.05

Table 6 provides an overview of the difference-in-difference estimation results. In the columns, we can see the coefficient estimates for the different difference-in-difference estimators we have introduced in the previous section: DiD A, DiD B and the three placebo DiDs. Next to the each of the DiD estimates is the respective standard error of the coefficient (SE). In case a coefficient is significantly different from 0, this has been marked by asterisk as follows: *** = 1% significance level, ** = 5 % significance level and * = 10% significance level. The rows, in turn, specify the outcome variable which the relevant estimate is referring to. We chose all the outcome variables to be binary (only containing two possible values) to facilitate the interpretation.

To ease understanding of the table, we give an example and explain in detail the interpretation of one specific outcome variable. The third outcome variable in table 6 refers to the share of learners that think that starting their own business after completing their matric would be a good career choice for them. The estimate of 0.04 in DiD A can be interpreted as follows: The increase over time (throughout grade 10) in learners thinking that starting their own business is a good career choice was 4% *higher* for business studies students who received startUP&go classes compared to non-business studies students in the same schools. The DiD B estimate for the same outcome variable can be interpreted similarly: startUP&go learners increased their answers to the question whether they want to start their own business by 6% *more* than business studies learners in control schools who did not receive startUP&go classes. Both of these estimates are significantly different from 0, at the 5 and 10% significance levels respectively. In all placebo specification, the estimates of this outcome variable are never significantly different from 0. As explained above, this gives indicative support for our underlying parallel trends assumption.

Overall, it must first be noted that the placebo DiDs reveal very few significant results, pointing towards the fact that DiD A and DiD B can indeed be interpreted as measuring the effect of startUP&go. You will quickly note that in general both difference-in-difference specifications (DiD A and DiD B) yield few significant results. One possible reason could of course be that startUP&go has no effect on the outcomes we are considering, but it must be noted, however, that startUP&go had varying degrees of implementation and was implemented late in some schools¹². In these schools the effect of introducing startUP&go may take another year to be fully visible. This problem is further exacerbated in DiD B, where we compare changes over time in startUP&go schools with changes over time in control schools. Since the number of control schools is much smaller than the number of treatment schools, the sample is greatly reduced which makes it more difficult to detect significant results.

In DiD A, where we look at changes over time in business studies learners versus non-business studies learners, we can observe several interesting significant impacts of startUP&go. More learners are encouraged to start their own business after leaving school. Both the number of

¹² Please also refer to section 3.4.2 on challenges in the implementation for a detailed discussion in this matter.

learners wanting to start their own business after completing their matric and the number of learners thinking that starting their own business would be a good career choice for them increased by 4% (the 95% confidence interval goes from 2% to 6%). However, the DiD B estimator for the first question (those that want to start their own business) is negative but not significantly different from 0. The DiD B estimator must be observed with care, we have seen above that it has a much smaller sample size.

Note that we do not have DiD estimates for the outcome variables in Table A2 as these had not been included in the baseline questionnaire. We have also run the same DiD regressions with further control variables¹³. The results are not perfectly stable when varying the control variables, however the direction of the central results we are presenting continue to hold.

¹³ Control variables included the big five personality traits as well as dummies for gender, year of birth, parental self-employment, whether the family owns a business and whether the learner works in that business. To facilitate understanding and tractability of the study results, we have not included tables with these additional results.

5. Interpretation and Conclusion

We conclude our analysis with a summary of the mixed results. The introduction of startUP&go gives promising indications of positive effects. The difference-in-difference estimation shows that learners taking startUP&go classes seem to be more interested in starting their own businesses after graduating from secondary school. The number of learners wanting to start their own businesses as well as the number of learners thinking that starting a business is a good career choice for them increased by 4%. These effects are robust to testing with placebo DiD estimations.

Considering the depth of the questionnaire and analysis, these are obviously not many and not very strong results. However, we did not expect very strong results at such an early stage in any case. As explained in section 3.4 on challenges, the real effects we are aiming at are long-term: we hope that more learners start businesses after completing their matric. We can only observe this after they leave school. We also do not have any information about the quality of the businesses that will be started in the future. Perhaps the true merit of startUP&go is not to induce all learners to start businesses, but to make sure that those learners who do choose to start businesses do so successfully. Some of the difficulties in implementation of the program described in section 3.4.2 may have also lead to a small effect size. We expect these difficulties to dissipate in the following years of startUP&go classes when teachers fully integrate startUP&go into their way of teaching.

To continue to assess the effectiveness of startUP&go, it is crucial that we continue the data collection process. A second follow-up questionnaire is planned for the end of the 2015 school year where the grade 10 learners to whom startUP&go was introduced in 2013 will be matriculating. By this time learners will have received 3 years of startUP&go, which will allow for solid evidence as to whether or not such an experiential entrepreneurship education programme increases entrepreneurial intentions. Such further follow-up questionnaires will let us measure the effects on a long-term basis and even allow more complex estimation designs such as triple-differences.

It will be especially interesting to follow the learners after leaving secondary school. Here the ILO has undertaken promising steps to track the learners by creating a website where they can continuously update their contact details and win prizes in exchange. The impact on entrepreneurship and youth unemployment may also be increased if we complement startUP&go classes with further support programs (for example mentoring, eased credit access or cash grants) for the youths after leaving secondary school.

In case the program is further expanded to different regions in South Africa it is strongly recommended to undertake a so-called “pipeline” randomized controlled trial (RCT) in which the program is phased in in incremental steps and the timeline is fully randomized. This would allow precise and irrefutable estimates of the impact of startUP&go on entrepreneurial intentions and labour market outcomes.

Appendix

Table A1: Single differences of treated learners (business studies learners at the end of grade 10 in startUP&go schools) versus control group B and versus group C for outcomes not asked in the baseline questionnaire (and thus group A is unavailable).

	Difference (B)	SE	Difference (C)	SE
Perceived Desirability of entrepreneurship score	0.034	0.072	0.554	*** 0.047
Perceived behavioural control score	0.02	0.088	0.417	*** 0.043
It is difficult to start one's own business due to lack of available financial support	0.169	** 0.065	0.069	* 0.037
It is difficult to start one's own business due to complex administrative procedures	0.009	0.072	0.01	0.025
It is difficult to obtain sufficient information on how to start a business	-0.082	0.105	0.001	0.038
One should not start a business if there is a risk it might fail	-0.16	* 0.081	-0.117	*** 0.039
Would fear of failure prevent you from starting a business?	0.024	0.02	0.007	0.014
Who are most respected in your country? Business owner ranked 1	0.011	0.038	0.161	*** 0.015
Who are most respected in your country? Business owner among best 3	-0.024	0.039	0.217	*** 0.018

Table A2: Single differences of treated learners (business studies learners at the end of grade 10 in startUP&go schools) versus control groups A (business studies learners in startUP&go schools at the beginning of grade 10), B (Business studies learners at the end of grade 10 in control schools) and C (non-business studies learners at the end of grade 10 in startUP&go schools). All of these outcomes were asked in baseline and follow-up.

	Difference (A)	SE	Difference (B)	SE	Difference (C)	SE
What do you plan to do after completing your matric? "Start my own business" vs. rest	0.05	*** 0.01	-0.02	0.04	0.14	*** 0.01
What do you plan to do after completing your matric? "Go for further education" vs. rest	-0.02	* 0.01	0.05	0.07	-0.14	*** 0.02
Do you think that starting a business would be a good career choice for you? Omitting "not sure"	0	0.01	0.05	* 0.03	0.21	*** 0.02
In your opinion, how easy/difficult would it be for you to start a business?	0.09	*** 0.02	-0.04	0.06	0.3	*** 0.04
Are you trying to start a new business at the moment?	0.02	** 0.01	-0.06	*** 0.02	0.16	*** 0.01
Do you know about any government programs that support businesses in your area?	0.01	0.01	-0.01	0.01	0.01	0
Describe your knowledge in: General management	0.08	*** 0.02	-0.01	0.03	0.2	*** 0.02

Describe your knowledge in: Purchasing	0.03	***	0.01	0.05	0.03	0.15	***	0.02	
Describe your knowledge in: Production	0.04	***	0.01	0.03	0.04	0.16	***	0.01	
Describe your knowledge in: Marketing	0.1	***	0.01	0.05	0.05	0.26	***	0.02	
Describe your knowledge in: Public relations	0.05	***	0.01	0.04	0.03	0.09	***	0.02	
Describe your knowledge in: Human resources	0.06	***	0.01	0.04	0.03	0.15	***	0.01	
Describe your knowledge in: Administration	0.02		0.01	0	0.04	0.12	***	0.02	
Describe your knowledge in: Financing	0.09	***	0.01	0.03	0.04	0.18	***	0.01	
I have the right attitude to start a business	-0.02		0.03	0.08	0.09	0.35	***	0.04	
I have the knowledge to start a business	0.03		0.02	0.03	0.04	0.46	***	0.04	
I have sufficient skills	0		0.02	0.09	0.05	0.36	***	0.03	
I have enough experience to start a business	0.03		0.03	0	0.06	0.45	***	0.04	
Where do you see yourself in 5 years' time? Collapsed into binary ("running my own business" vs. rest)	-0.01		0.01	0.01	0.04	0.22	***	0.02	
What type of employment would you like to be in? "for myself in my own business" ranked 1	0		0.01	0.09	***	0.03	0.2	***	0.01
What type of employment would you like to be in? "for myself in my own business" among best 3	-0.02	*	0.01	0.07	*	0.04	0.19	***	0.01

Table A3: Scores. This table gives an overview of how the scores in this report were calculated.

Panel A: Big five personality traits
Scores are calculated as simple means of answers on 7-point Likert scale: "Disagree strongly", "Disagree moderately", "Disagree a little", "Neither agree nor disagree", "Agree a little", "Agree moderately" to "Agree strongly". The question was "I see myself as... XXX". R denotes reverse coding. This score follows from Gosling et al. (2003)
Extraversion: "Extraverted, enthusiastic" and "Reserved, Quiet"(R)
Agreeableness: "Sympathetic, warm" and "Critical, quarrelsome" (R)
Conscientiousness: "Dependable, self-disciplined" and "Disorganized, careless" (R)
Emotional stability: "Calm, emotional stable" and "Anxious, easily upset" (R)
Openness: "Open to new experiences, complex" and "Conventional, uncreative" (R)
Panel B: Perceived Desirability of Entrepreneurship score
Q1: I would rather own my own business than earn a higher salary as an employee
Q2: I would rather own my own business than pursue a promising career as an employee
Q3: I am willing to make significant personal sacrifices in order to stay in my own business
Q4: I would work somewhere else only in order to make another attempt to start my own business
Q5: I am willing to work more with the same salary in my own business, than as an employee
Each question is answered on a 7-point Likert scale with answers "Disagree strongly"=1, "Disagree moderately"=2, "Disagree a little"=3, "Neither agree nor disagree"=4, "Agree a little"=5, "Agree moderately"=6 to "Agree strongly"=7. The perceived desirability score is calculated as the simple average of the answers to the 5 questions above. The score is taken from Gundry and Welsch (2001) and Kolvareid and Isaksen (2006).

Panel C: Perceived Behavioral Control Score

Q1: For me, being self-employed would be very easy

Q2: If I wanted to, I could easily pursue a career being self-employed

Q3: Being self-employed, I would have complete control over the situation

Q4: The number of events outside my control which could prevent me from being self-employed is very high

Q5: If I become self-employed, the chances of success would be very high

Q6: If I pursue a career being self-employed, the chances of failure would be very high

Each question is answered on a 7-point Likert scale with answers "Disagree strongly"=1, "Disagree moderately"=2, Disagree a little"=3, Neither agree nor disagree"=4, "Agree a little"=5, Agree moderately"=6 to "Agree strongly"=7. The perceived desirability score is calculated as the simple average of the answers to the 5 questions above. The score is taken from Kolvereid (1996).

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