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The effects of an education program on social and sustainable entrepreneurship for primary school children

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ABSTRACT

This paper provides new insights into entrepreneurship education (EE) for children, by combining three elements that expand the EE literature in a novel direction: (1) the content focus is on social and sustainable entrepreneurship; (2) the educational setting studied is primary education; and (3) the focus is on the effects as perceived by the participating children themselves.

Explorative research was done on two programs delivered by EE provider Fawaka School of Entrepreneurship in the city of Amsterdam, the Netherlands. A one-group pre-test/post-test survey among the full population of 450 participating children was conducted in 2021. The results provide clues that a program focused on sustainable and social entrepreneurship can provide different results than more 'general' programs on entrepreneurship, in particular with regard to differences between girls and boys. After the program, differences in entrepreneurial intentions are significantly smaller, and a number of significant differences with regard to self-confidence disappear.

1. Introduction

As our world struggles with major social and ecological problems, educating children about social and sustainable entrepreneurship is a wise idea. Entrepreneurship education (EE) in general has become widespread over the past 20 years and so has research on didactic approaches and their effectiveness (see for example Kuratko 2005 and Ratten and Usmanij 2021 for a recent overview). The importance of EE is clearly recognized at policy level, as for example reflected in the development of the Entrecomp framework (Bacigalupo et al., 2016) and subsequent support materials (EU Science Hub, 2022). The Entrecomp framework increasingly serves as a 'common language' for EE in Europe and beyond.

However, traditional EE education materials and models like Entrecomp do not explicitly address the distinction between (competences for) 'profit-driven' entrepreneurship and social and/or sustainable entrepreneurship. In EE practice, there is still a lack of focus on social and sustainable aspects, as was also recognized by the European Commission in its 2021 Action Plan on Social Economy: 'social economy business models, including the cooperative forms, are still far from being a standard component in all entrepreneurship education curricula and business courses' (European Commission, 2021, p. 14).

The new Greencomp European sustainability competence framework (Bianchi et al. 2022) could form a useful basis to start rethinking entrepreneurship curricula, approaching it from a sustainability point of view. However, this framework does not explicitly address entrepreneurial competences; and limited support materials have been developed so far. There is thus a clear 'gap' in frameworks and supporting materials for education programs focusing on social and sustainable entrepreneurship.

This gap becomes even more pronounced when the focus is on this type of EE for the particular target group of primary school children. While Entrecomp integrates different levels of development for each competence; existing measurement instruments related to the Entrecomp framework are mainly aimed at teenagers and/or (young) adults.

In addition, in EE literature focus is mostly on higher education, with only few studies addressing EE for primary school children, as will be further detailed in the literature review below.

In the research design phase, we identified another knowledge gap. Particularly few studies were found about the effects of entrepreneurship programs in primary education as perceived by the participating children themselves. The limited existing literature mainly focuses on evaluations by teachers and/or the testing of knowledge.

To sum up, we identify 'knowledge gaps' with regard to EE in

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relation to the combination of three specific factors:

(1) the *content* focus on social and sustainable entrepreneurship (instead of entrepreneurship with financial profit as the main goal);

(2) the educational *setting* of primary education;

(3) the *research approach*, focused on the effects of the program as perceived by the children themselves and their parents.

While little knowledge about EE programs on social and sustainable entrepreneurship in primary education may have been shared in scientific literature, this does not imply that such programs do not exist. This paper reports on a program about social and sustainable entrepreneurship run by EE provider Fawaka School of Entrepreneurship at primary schools in the city of Amsterdam, the Netherlands. With the support of Amsterdam Impact (the program of the municipality of Amsterdam that – among other things - promotes impact entrepreneurship), Fawaka offered its program to around 450 Amsterdam primary school children during 2021. Amsterdam University of Applied Sciences was asked to conduct explorative research into the effects of the program.

The purpose of this study is to provide more insights into the effects of EE programs, specifically focusing on the three gaps identified above. Through our exploratory approach, we aim to provide the EE community with clues about an effective setup of such programs. In addition, observed differences in results for subgroups call for further research.

2. Literature review

In this section, we present a short literature review regarding the three specific elements of this study which - taken together - provide a new perspective to entrepreneurship education:

1. Content - Social, sustainable and impact entrepreneurship.
2. Setting – EE in primary schools.
3. Research approach – Children's perceptions of EE programs.

2.1. Content: Social, sustainable and impact entrepreneurship

In 'classic' entrepreneurship literature, much attention is paid to the role of factors necessary to achieve economic and financial success, such as leadership, new product development, innovation and creativity, risk financing and idea protection (Austin et al., 2006; Bacq et al., 2013). In recent years, new forms of economic thinking emerge, often starting from the realization that unlimited growth is not possible on a planet with limited resources. The economy then takes on a new purpose. For example, British economist Kate Raworth defines this new goal as achieving 'human prosperity in a flourishing web of life' (Raworth, 2017, p. 60). Forms of entrepreneurship that fit these principles are called social and/or sustainable entrepreneurship; or impact entrepreneurship (see Markman et al. 2019).

Social entrepreneurship is aimed at multiple value creation. Social enterprises are businesses 'whose primary goal is to generate positive social impact' (European Commission, 2020, p. 5). The social entrepreneur has a number of similarities with the commercial entrepreneur (see, for example, Austin et al. 2006), but there are also important differences (Bacq et al., 2013; Stephan & Drencheva, 2017). The social entrepreneur seizes opportunities in tackling social problems (such as hunger or poverty) or in relation to environmental issues (such as access to clean water and renewable energy) and thus does not necessarily look for a gap in the market, but rather for a 'gap in society' (see for example Martin and Osberg 2007, Klomp et al. 2016). The social entrepreneur therefore measures her performance or impact in relation to the creation of social or ecological value, in addition to financial value (Choi & Majumdar, 2014). While social entrepreneurs are necessarily concerned with creating economic value in order to survive, innovate and thrive, for them creating economic value is a *means* to achieve their goals rather than an end itself (Zahra et al., 2009; Belz & Binder, 2017; Saebi et al., 2019).

In recent years, education programs about this type of entrepreneurship have started to develop, particularly at the university level

(Karatas-Ozkan et al., 2023).

Sustainable entrepreneurship is a broad term. Interpretations of the term sustainability begin with the Brundtland Commission's classic report Our Common Future. It defines sustainable development as 'development that meets the needs of the present, without compromising the ability of future generations to meet their own needs' (WCED, 1987). This implies a long-term approach (Boersma-de Jong, 2021, p. 117). For companies, this has often been translated into the 'triple bottom line' or the 3 Ps (Elkington & Rowlands, 1999), where focus is on creating social value (People), ecological value (Planet) and financial value (Profit). It should be noted that the creator of the 3Ps concept, John Elkington, has voiced serious reservations about the broad use of his own ideas a few years ago (Elkington, 2018). The original definition of the Brundtland Commission fits well with the emphasis on the long term and the multiple value creation that is also central to social entrepreneurship.

As with social entrepreneurship, sustainable entrepreneurship is a topic receiving increasing attention in education, again particularly in higher education (see for example Dodd et al. 2022).

Impact (or impact-driven) entrepreneurship is a new term, emerging in recent years. Markman et al. (2019) define it as 'the development of sustained applications and solutions that collectively address grand challenges to make the world better' (p. 372). In Amsterdam, the municipality uses this broad term in its Amsterdam Impact program. The term refers to a broad group of companies that are serious about making an impact on a social, ecological and economic level. The City sees social and sustainable entrepreneurship as embedded in the broader concept of impact entrepreneurship (City of Amsterdam, 2019).

All three terms refer to forms of entrepreneurship in which the creation of social, ecological and financial value are all important. These new forms of entrepreneurship are clearly on the rise (Bosma et al., 2016; Gupta et al., 2020; European Commission, 2020), but have not yet found their way to the 'mainstream' of entrepreneurship education (European Commission, 2021).

2.2. Setting: Entrepreneurship education in primary schools

The knowledge gap regarding educational programs on social and sustainable entrepreneurship is particularly relevant in relation to primary education (defined as ISCED level 1, usually for children up to around 12 years of age). The vast majority of research into EE and its effects has been conducted in higher education (see Nabi et al. 2017). A recent literature review about *sustainable* entrepreneurship education in formal school settings found 65 studies, but none of these used a data set related to primary education (Diepolder et al., 2021, p. 10). In another recent literature review (Martínez-Gregorio et al., 2021), which used rather rigorous methodological criteria for inclusion, only one study at the primary school level was found (Huber et al. 2014, discussed in Section 2.3).

Looking at EE in both primary and secondary education, the results of 21 studies were analyzed by Brüne and Lutz (2020). The design of the studies varied greatly; and this also applied to the programs and the age groups they targeted. Five programs targeted a primary school age group. These were a Portuguese program for children aged 6–8 (Do Paço & Palinhas, 2011), a Spanish program for children aged 8–12 (Atienza-Sahuquillo et al., 2016), a Mexican program for children aged 11–12 (Cárcamo-Solís et al., 2017), a Swedish program for children aged 10–12 (Leffler & Svedberg, 2005) and a Dutch program for children aged 11–12 (Huber et al., 2014).

Taking the studies on all school education levels together, the researchers found some general directions in the results, especially in the area of self-efficacy and the desire to start entrepreneurial activities. Three elements were found to explain differences:

- *previous entrepreneurship experiences*: the desire to do business increased more among those with previous entrepreneurship experiences;
- *age*: stronger positive effects can be seen in younger children. Both the belief in one's own abilities and the desire to do business increase more strongly in younger children compared to older children;
- *gender*: self-confidence of girls generally decreases after programs, while it increases in boys.

An additional insight was that programs appear to work better if they are oriented towards 'playfulness' than if they are more competitively oriented (Brüne & Lutz, 2020, p. 293–300).

Two recent studies not included in Brüne and Lutz's overview deserve mentioning. First, Bisanz and colleagues (2019) present an overview of the results of (SDG) challenge based entrepreneurship education in primary schools in Austria. Basing their results on interviews with teachers, they conclude that the program has strengthened children's self-confidence, initiative, innovation, creativity, mindfulness, empathy, self-motivation and participation in society. Second, Pepin (2018) reports on a yearlong program in a Canadian school in which seven and eight-year old pupils run a school shop together. He observed 'pupil councils' and learning activities related to the school shop; and interviewed the teacher 21 times. In conclusion, he finds that 'if an entrepreneurial project is indeed an effective means of encouraging students to be enterprising, learning to be enterprising and learning through being enterprising ultimately call for an inquiry-based pedagogy'.

2.3. Research approach: Children's perception of EE programs

In the already limited literature on the effects of EE for children, an even smaller subset of studies focuses on the effects as perceived by the children themselves. Children's views of education are particularly important but often overlooked (Gillett-Swan & Sargeant, 2018). Perhaps most similar to this study is the piece by Laura Huber and colleagues (Huber et al., 2014), who analyzed the effectiveness of the Dutch 'BizWorld' education program by subjecting the children to two questionnaires, using pre-test / post-test design including a control group. Their results indicated positive effects in the development of non-cognitive entrepreneurial skills such as creativity, proactivity and risk taking. Little effect was seen on the development of what they called 'entrepreneurial knowledge', i.e. 'knowledge about what an entrepreneur does and what it entails to run a business' (p. 85). This was operationalized in seven multiple choice questions, some of which were slightly rephrased between T0 and T1. An example was "If a company makes less revenue by selling products or services than it spends, it will ... (a) be registered at the stock market, (b) make a profit, (c) make a loss, (d) have debts" A slightly positive but insignificant effect was seen. The researchers saw a negative effect on entrepreneurial intentions: after the program, children were on average less positive about whether they wanted to become an entrepreneur later on.

This effect of lowered average scores on entrepreneurial intentions is known from earlier research into EE programs in higher education as the 'sorting effect' (Von Graevenitz et al., 2010). This implies that 'the signal provided by the course will increase sorting of students into two groups that are increasingly sure that they are or are not entrepreneurs' (p. 94). In general, findings about the effects of EE programs on entrepreneurial intentions vary. In their meta-analysis of EE programs in higher education, Nabi et al. (2017) found that 'most of the reviewed articles (61 articles out of 81, 75%) report a positive link between EE and participants' start-up intentions' (p. 281). However, another meta-analysis of 73 articles by Bae et al. (2014), which was not focused on a specific education level, found that after accounting for the effect of pre-education entrepreneurial intentions, there was no significant relationship between entrepreneurship education and post-education entrepreneurial intentions. Therefore they concluded that 'the

often-referenced relationship between entrepreneurship education and entrepreneurial intention is most likely due to a selection effect from a theoretical and a practical perspective' (p. 238–239). In a special issue focused on 'under-researched domains in entrepreneurship and enterprise education', Liguori et al. (2019) identified primary schools as one of the 'neglected populations'.

Back in the Dutch context, Van Welsen (2012), a researcher at the University of Twente, investigated the effect of a program in primary schools focusing on the development of entrepreneurial attitudes. This case study was conducted at a small village school in one class of 21 children aged approximately 10–12. They started a fictitious company, which they ran twice a month for a year. The researcher interviewed the pupils and teacher and consequently analyzed how pupils developed and how they experienced this intervention. The importance of a realistic context and sense of ownership clearly emerged from this research. This formed the basis for a positive effect on the development of competences such as cooperation, self-management and presentation.

In conclusion, valuable lessons can be learned from the existing literature. However, to the best of the authors' knowledge, there is no published study on an EE program which combines the three elements of focusing on social and sustainable entrepreneurship, primary school children and the effects as perceived by the participating children themselves.

3. Context of the study

In the Netherlands, following the worldwide trend, a rapidly increasing number of companies put solving social and ecological problems first. This has mainly been a 'bottom-up' development: there is no specific legal framework for social enterprises yet, and institutional support for social enterprises has mainly come from the municipal level (Aisenberg, Heikkilä, Noya, & Santos, 2019; Hogenstijn, 2021). The City of Amsterdam's program *Amsterdam Impact 2019–2022* aims to create conditions to stimulate impact entrepreneurship and the transition to an impact economy (City of Amsterdam, 2019).

Fawaka School of Entrepreneurship (in Dutch: Ondernemersschool) is an Amsterdam-based social enterprise which offers educational activities for children and young people. The mission is to introduce all young people in the Netherlands to sustainable entrepreneurship, regardless of the neighborhood in which they grow up, their way of learning and their background, to do business with an eye for the world and the people with whom they share it. In implementing its programs, Fawaka focuses on both an entrepreneurial attitude and sustainable action: 'On the one hand, we teach children an entrepreneurial attitude, for example creative thinking, collaboration, solution-oriented thinking and perseverance; or self-development. On the other hand, we teach the children to act sustainably, in other words positively towards people and the environment' (Ondernemersschool, 2022, own translation). Note that Fawaka uses a broad approach towards the concept of 'entrepreneurial attitude', not linking all the attributes mentioned directly to behavior. Their conceptualization is different than in the Theory of Planned Behavior (Ajzen, 1985), which is often-used in this field.

Fawaka offers educational programs for different levels. Their programs for primary schools consist of a series of workshops offered at school during regular class time, in which the children fictitiously start their own impact-driven company. For this study two programs were investigated, which were run by Fawaka trainers and consist of six two-hour lessons or activities:

1. Choco Entrepreneurs

In the Choco program, small groups of children take on the challenge of developing their own fairtrade chocolate brand. The children investigate fresh cocoa fruits, the production process and the production chain. They receive lessons on marketing, pitching and pricing. They design their own chocolate wrapper with the help of a graphic designer; pitch their company to a banker and work towards the 'Delicious Fair Chocolate Market'; the final event where the children sell their self-

developed fair trade chocolate brands.

2. Upcycle Entrepreneurs

In the Upcycle program, children take on the challenge to give value to discarded materials. Together with a product designer, they design and make their own product line and give “waste” a second life. They learn about recycling, upcycling and circularity; as well as marketing and pitching. The children discover that what we throw away can be a raw material for something new. The children pitch their product to a financial expert and work towards the ‘Upcycle Makers Market’, where they sell their self-developed items.

Both programs are normally concluded with an event in the school. Due to COVID-19 measures, this was not possible at the time of the study. In the Choco program the children sold chocolate bars to family and friends. The program was concluded by announcing the proceeds of the sale by the various groups in the class. The Upcycle program was concluded by doing a ‘rap battle’ in groups for the whole class.

Both programs have extensive teacher’s manuals, which were made available to the researchers. These include preparation, learning objectives, activities / working methods, assignments and materials for each lesson. During the program the teachers also use a ‘box’ with materials, plus an online library with images and videos. Due to the extensive manuals, the programs are implemented in similar ways in different schools, although there is of course room for improvisation.

4. Research approach

As this research is focused on a novel combination of topics, an explorative approach was taken, covering a variety of concepts, with an aim of finding clues for more in-depth follow-up research.

4.1. Methodology

The data collection followed a quasi-experimental mixed-methods approach with a one-group pre-test/post-test survey among the full population of participating children. The one-group pre-test/post-test method has obvious weaknesses, mainly with regards to internal validity (Campbell & Stanley, 1966 [1963]; Reichardt, 2009). The lack of a control group implies that attributability of results to the intervention is tricky. However, an ethical argument for not using a control group concerns the benefits for the participants (Mark & Lenz-Watson, 2011, p. 198). It is expected that participants learn something extra, while non-participants would still have to experience the burden of filling in two questionnaires without the benefits. This issue of ‘beneficence’ is especially relevant when doing research with children (Powell et al., 2012, p. 21).

In addition, in this particular case a study of *all* participants in the program was deemed important for evaluation purposes and would allow for division into various subgroups, which could lead to a variety of suggestions for further research. Resources did not allow for a control group in addition to the full population of participants.

In the specific design of our pre-test and post-test research process, the aim was to reduce the risks of this approach as summarized by Reichardt (2009, p. 190) as much as possible, following Eckert’s insight that ‘situational factors, or “the right setting,” may exist that diminish the plausibility of one or more threats, thereby enhancing the overall validity of the design’ (Eckert, 2000, p. 186). The risks and mitigation measures are summarized in Table 1.

The ‘testing’ threat is the most serious concern. Children might have provided the answers they thought the researchers would like to hear, while others may not have taken the surveys seriously. This was mitigated by implementing a careful classroom procedure, as detailed in Section 4.2.

The expressly intent of this research was *not* to question the development of knowledge or skills among the children in the form of a ‘test’, because this does not fit with the principles of the Fawaka programs. This implied a choice for self-evaluation.

Table 1

Risks of one-group pre-test/post-test method and mitigation measures.

Risk	Explanation	Mitigation
History	Major events happen between pre-test and post-test	-Length of program was only 6–7 weeks
Maturation	Respondents getting older, gaining knowledge/skills in another way than through the intervention	-Content unlikely to be included elsewhere in educational activities -Low probability of in and out-of-school events that may influence development of participating children (COVID-19 measures)
Instrumentation	Change in measurement instrument	No change
Testing	Act of testing itself affects the results	Careful informed consent and classroom procedure (see 4.2)
Regression	Participants’ scores are higher or lower than expected and a natural return to normal artificially inflates or deflates the estimated gain	All participants were tested, no selection made

Risks based on Reichardt (2009), p. 190.

The main aim of this research was to explore perceived development of (subgroups of) participants. This was operationalized in five main concepts:

1. Knowledge
2. Skills
3. Attitude
4. Intentions
5. Evaluation (only post-program).

The novel subject and specific age group implied that existing validated questionnaires could not be used, although Van Welsen’s study (2012) was used as inspiration. Therefore, an own questionnaire was developed, based on the following considerations:

- User-friendliness. The target group consisted of children aged 9–12 years (groups 6 to 8 in the Dutch school system). To ensure that children with varying language and developmental levels are all able to complete the questionnaire, it must be short and clear. Therefore, the main part consists of statements with 5-point Likert scales. To present the answer options, smileys are used. These are considered suitable for children with lower literacy levels, and are more fun to fill in Stange et al. (2018). In addition, there is some evidence that mean and standard deviation differences between boys and girls are lowest using smiley Likert scales, when comparing them to a Likert scale using suns or text (Reynolds-Keefer et al., 2009, p. 18). The smileys expressed the scaling in two ways: through the expression (very sad to very happy looking) and through color (red to yellow to green).
- Limited personal data. Only those background questions necessary for the analysis were to be included. Gender is relevant, because in EE research significant differences are often found between women/girls on the one hand and men/boys on the other hand (Huber et al., 2014; Shinnar et al., 2014; Brüne & Lutz, 2020). An identifying element to connect the T0 questionnaire of a specific child to the T1 questionnaire was needed. After consultation with the Research Ethics Committee of our university, it was decided to use a self-chosen ‘nickname’ that children come up with when completing the T0 questionnaire and use again when completing the T1 questionnaire.

Eventually the questionnaire consisted of 21 statements, supplemented for post-test (T1) with five additional evaluative statements (see supplementary material). At the end there was room for a general open question (both surveys) and an additional open question about what the children learned (only T1). The T0 questionnaire was piloted at one

school. As a result, minor adjustments were made to the explanatory introductory text only. All questions remained the same. The results of the pilot school have therefore been included in the total.

In addition, a topic list was prepared for in-depth group discussions with children; and a guide was prepared for short interviews with parents (both for use after the program).

4.2. Data collection

The programs of Fawaka School of Entrepreneurship took place in a difficult period. The planned start in January 2021 had to be postponed, as schools were closed due to measures to contain the COVID-19 virus. For much of the study period, schools were faced with restrictions, for example blocking parents from entering the school. The data collection was carried out in three phases. The circumstances regarding COVID-related restrictions differed slightly. The research team kept a logbook with ‘fieldnotes’ about the atmosphere at school and in the classroom (Table 2).

Participating schools

The participating schools were recruited by Fawaka, which aimed for a variety of schools, focusing on underprivileged neighborhoods where possible. Fawaka told the schools that their program is linked to a research project. The research team coordinated the practical aspects of the research with the school’s contact person, including the procedures for informed consent (see below).

A total of 21 groups from eight schools participated. The schools are located in four out of the seven Amsterdam districts (Southeast, East, New-West and North), and the number of pupils per school ranges from around 150 to around 450. Five schools are public-authority schools and three are private schools. In Dutch primary education, private schools are very common. They do not charge tuition fees and receive similar funding compared to public-authority schools, but pupils are taught according to religious or ideological convictions. All participating schools have a diverse population of pupils, fitting the position of Amsterdam as a superdiverse city, where an average of 61% of primary school pupils have a migration background (City of Amsterdam [Gemeente Amsterdam] 2020 p. 16). A pupil has a migration background if the pupil him/herself or at least one of the parents was born abroad.

Informed consent procedure

The informed consent procedure included four steps:

- 1 Active informed consent from the school management (signed form).
- 2 Passive informed consent from parents for participation of children in the survey. Parents were informed by means of a letter and given

the opportunity to ask questions and indicate if they did not want their child to participate. Four parents made use of this ‘opt out’.

- 3 Active informed consent from parents for their child’s participation in a group discussion and the parent’s own participation in an interview (signed form).
- 4 Consent from the children. The researchers explained in the classroom what the research entailed. Children were given the opportunity to ask questions and to indicate if they did not want to participate. The children selected for group discussions were individually asked if they would like to participate.

Procedure in the classroom

The data collection took place in the school. In most groups, a researcher distributed and collected the survey in the classroom during both the start of the first lesson (T0 survey) and the end of the last lesson (T1 survey). Where this was not possible, a video was used in which a researcher explains the research. The Fawaka teacher then gave the opportunity to ask questions and distributed and collected the survey. For group discussions, a researcher was always present.

Details of the data collection procedure were recorded in a file ‘fieldnotes’. Some problems were encountered. In one group, some pupils completed the T0 survey a few days after the first lesson due to a misunderstanding about informed consent forms. In another group, unexpected circumstances in the class led to the T1 survey being completed a few days later. In yet another group, some children accidentally filled in the T0 survey at the time of the T1 survey, which means that their response to evaluation questions is missing.

Finally, after completion of the program, Fawaka teachers were asked via email if they believe any circumstances could influence the results in a particular group. One teacher reported not having a good ‘click’ with the group; and indeed children in this group evaluated relatively negatively. These results were still included in the analysis.

Questionnaires (T0 and T1)

In total questionnaire data from 450 ‘nicknames’ were collected. Possibly this concerns the same children in a few cases where nicknames could not be linked. Most children completed the questionnaires online via Qualtrics (287 children, 64%). The rest completed it on paper (163 children, 36%; researchers manually entered these answers into SPSS for analysis). In the surveys completed on paper, there are slightly more ‘missing values’.

Data are collected from 412 children at T0; and 375 children at T1. In total, 337 sets of T0 and T1 questionnaires could be linked using the nicknames. Relatively many children were absent from the first or last lesson due to illness, quarantine or other reasons. This was especially true in phase 2, just before the summer holidays.

After collection, the dataset was cleaned. Two cases were removed because they were clearly not filled in seriously – less than two minutes were spent completing them, and all answers given were the first and middle option respectively. In three cases, the online questionnaire was (partially) completed twice with the same nickname (in one case the researcher observed that a tablet crashed and the survey needed to be restarted). These double cases were removed.

5. Results

This section focuses on results of the surveys among all participating children before (T0) and after (T1) the program, with an average of six weeks between T0 and T1. The entire population was surveyed, except four children for whom parents did not give permission. This number (less than 1% of all children) is regarded as negligible. In total, 337 linked sets of T0 and T1 questionnaires are available; plus 75 more records at T0 (without a coupled T1); and 38 more at T1 (without a coupled T0). To make maximal use of the richness of the data, all available data were used where possible.

The series of individual statements on knowledge, skills, attitude and intentions were not constructed as cohesive scales per topic. Therefore,

Table 2 Phases of data collection.

Phase	Period	Groups	Circumstances	Atmosphere at school (interpretation research team)
1	March–April 2021	6	Start first school immediately after reopening; restrictive measures regarding access / distancing / face masks	Happy to go back to school
2	May–July 2021	13	Restrictive measures differ per school	Varying, fatigue towards the end of a difficult school year
3	September–November 2021	2	Increasing restrictive measures during program	Increasing stress, partly due to threat of new measures

analysis is restricted to the level of these individual statements (using t-tests), not taking them together.

Results from other data collection in this study (16 group discussions with selected participating children; and 37 short telephone interviews with parents) are briefly discussed at the end of this section.

5.1. Descriptive statistics

Descriptive data are presented in Table 3. Of the 450 children, 35% followed the Choco program and 65% the Upcycle program. Over half of all children were in group 7, which corresponds to age 10–11 in the Dutch system.

At T0, two questions measured possible prior knowledge. About half of the children say they know someone who owns their own company. It is not specified how ‘close’ this person is, so whether it concerns a parent, another family member, or an acquaintance. When asked whether they had ever had lessons about starting their own business, 29% of the children said yes. It was not specified what lessons, and whether they were provided by Fawaka.

5.2. Knowledge development

Four statements about perceived knowledge were presented in both questionnaires, which children could score on a scale of 1 to 5. Paired samples t-tests were conducted and on all questions the increase was found to be significant (Table 4). The strongest effect ($d = -0.831$) is seen with respect to the statement ‘I know a lot about how to start a business’. Children clearly feel that they have more knowledge about this after the program.

The scores of subgroups with regard to the question about ‘how to start a business’ were analyzed in two ways. First, with regard to the programs Choco and Upcycle. The increase in scores for each of the programs is significant using paired samples t-tests (Table 5a), but the effect is highest for the Choco program ($d = -1.073$). The difference in score between T0 and T1 (M_{Δ}) for the Choco program is higher than for the Upcycle program and this difference proves significant using an independent samples t-test (Table 5b).

Table 3
Descriptive statistics participants Fawaka programs.

Theme	Groups	Count	%
Program	Choco	158	35%
	Upcycle	292	65%
	Total	450	100%
Grade	Group 6 (9–10 year-olds)	98	23%
	Group 7 (10–11 year-olds)	235	55%
	Group 8 (11–12 year-olds)	96	22%
	Total	429*	100%
Gender	Girl	217	48%
	Boy	208	46%
	Other	15	3%
	Do not want to say	7	2%
	No answer	3	1%
	Total	450	100%
Prior lessons on entrepreneurship	Yes	119	29%
	No	293	71%
	Total	412**	100%
Knowing an entrepreneur	Yes	210	51%
	No	105	25%
	Don't know	97	24%
	Total	412**	100%

* The pilot took place with a Choco program in a ‘plus class’, consisting of pupils from groups 6–8. This ‘plus class’ is not included in the figures broken down by group.

** These questions were only asked in the T0 questionnaire.

Second, differences with regard to previous lessons about starting a business were analyzed. As might be expected, knowledge differed at T0, but the exact same score is found at T1. While for both groups the increase of scores proved significant using a paired samples t-test (Table 6a), the effect was clearly strongest for the group without previous lessons on entrepreneurship ($d = -0.982$). The difference in score between T0 and T1 (M_{Δ}) for those without previous lessons is higher than for those with previous lessons and this difference proves significant using an independent samples t-test (Table 6b).

5.3. Skills development

The next set of questions dealt with development of skills. A number of non-cognitive skills related to entrepreneurship was included. It is very difficult to attribute development on these skills to the Fawaka program. Nevertheless, for the full population significant differences were found for two statements: ‘I often have ideas to solve problems’ and ‘I can present my ideas well’ (see Table 7).

Differentiating on gender, girls scored themselves significantly lower than boys on three questions at T0. Interestingly, at T1 the differences on each question were much smaller and no longer significant (Table 8; note that other categories were excluded from analysis).

5.4. Attitude development

Five statements assessed the attitude of children towards sustainable and social goals and the role of companies (see Table 9). Limited changes in scores are seen for the full population, with only one statement showing a significant change. Interestingly, this is the statement most directly related to social entrepreneurship: ‘I believe that companies can help solve the world’s major problems’. The percentage of children who (strongly) agree with this statement rises from 59% to 73%.

5.5. Intentions development

The future plans of children in relation to (social) entrepreneurship were questioned in five statements (Table 10). The only statement with a significant change for the full population is ‘I think it would be nice to have my own company in the future’, where the score after the program is lower than before.

Looking specifically at gender, the change in scores of girls compared to boys was found significantly lower using an independent samples t-test (Table 11, note that other options than boy or girl were removed). On average, girls start with a slightly lower score than boys on this statement at T0, but end up with a higher score at T1.

Three statements related to how children see their role in ‘helping to solve big problems in the world’ in their later working life. For the full population, differences in scores between T0 and T1 are not significant. However, regarding the statement ‘later when I go to work, I want to help solve the problems in the world’, there is a significant increase among children who say they do not know someone with their own company. Using the paired samples t-test for this specific group, the score after the program ($M = 4.28$, $SD = 0.82$) is 0.39 point higher than before the program ($M = 3.89$; $SD = 1.18$) and this increase is significant ($t(78) = -2.67$; $p = 0.009$). Comparing the differences in scores $M_{\Delta} (=M_{T0} - M_{T1})$ using an independent samples t-test, the change in scores of those who do know someone with their own company ($M_{\Delta} = -0.06$, $SD = 1.12$) compared to those who do not know someone with their own company ($M_{\Delta} = 0.39$, $SD = 1.31$) was found significantly lower ($t(239) = -2.76$, $p = 0.006$). The group that does not know such a person starts with a score that is 0.23 point lower but ends with a score that is 0.22 point higher.

5.6. Evaluation

The final questions in the T1 questionnaire dealt with the children’s opinion about the Fawaka program. They were asked to rate the

Table 4
Knowledge development, before (T0) and after (T1) the program.

	T0		T1		M_{Δ}^*	t	df	p**	Cohen's d
	M	SD	M	SD					
how to start a business	2.66	1.20	3.81	1.12	-1.15	-15.23	336	<0.001	-0.831
what sustainability means	3.83	1.24	4.16	1.09	-0.33	-4.65	333	<0.001	-0.254
how to handle money well	4.14	1.06	4.26	0.98	-0.12	-1.97	333	0.050	-0.108
where items in the shop come from	3.32	1.12	3.61	1.14	-0.29	-3.85	335	<0.001	-0.210

* $M_{\Delta}=M_{T0}-M_{T1}$.

** Two-sided. Significant differences shown in bold in this and all following tables.

Table 5
'How to start a business' according to program.

a. Knowledge										
	T0		T1		M_{Δ}^*	Paired samples t-test			Two-sided p	Cohen's d
	M	SD	M	SD		t	df			
Choco	2.44	1.22	3.88	1.16	-1.44	-12.65	138		<0.001	-1.073
Upcycle	2.81	1.16	3.76	1.09	-0.94	-9.67	197		<0.001	-0.687

b. Development of knowledge										
$M_{\Delta} (=M_{T0}-M_{T1})$	Choco		Upcycle		Independent samples t-test			Two-sided p		
	M	SD	M	SD	t	df				
	1.44	1.34	0.94	1.38	-3.28	335		0.0001		

* $M_{\Delta}=M_{T0}-M_{T1}$.

program on a scale of 1 to 10, which is the usual Dutch grading system. The mean score was 8.0, which corresponds to 'good'. The difference in scores between the Choco program (M = 8.44; SD = 2.17) and the Upcycle program (M=7.73; SD = 2.22) was found significant (t (337) = 2.93; p = 0.004). Girls rate the program slightly higher than boys (8.3 to 7.9; not statistically significant).

Four additional evaluation questions were asked (Table 12).

The participants in the Choco program scored significantly higher on two questions: they had more joy during the entrepreneurship lessons (M=4.35; SD=1.12 versus M=4.00; SD=1.10; t(354) = 2.85; p=0.005) and they are more proud of what they achieved (M=4.46; SD=0.94 versus M=4.09; SD=1.04; t(355) = 3.37 p<0.001). Children who did

not have previous classes about entrepreneurship before also had significantly more joy than those who did (M=4.23; SD=1.12 versus M=3.91; SD=1.15; t(319) = -1.87; p=0.022).

5.7. Main learnings and other comments

At the end of the T1 questionnaire, the children were asked to 'name one thing you have learned from the entrepreneurship lessons'. 319 children answered this question, which resulted in a rich and varied picture. The answers were categorized by the authors, using an inductive approach. This was relatively simple, as most answers consisted of only a few words or a short sentence (Table 13). Note that 23 children filled in

Table 6
'How to start a business' according to previous lessons on entrepreneurship.

a. Knowledge										
	T0		T1		M_{Δ}^*	Paired samples t-test			p**	Cohen's d
	M	SD	M	SD		t	df			
Previous lessons	3.25	0.99	3.81	1.11	-0.56	-4.70	92		<0.001	-0.488
No previous lessons	2.43	1.19	3.81	1.12	-1.37	-15.34	243		<0.001	-0.982

b. Development of knowledge										
$M_{\Delta} (=M_{T0}-M_{T1})$	Yes		No		Independent samples t-test			two-sided p		
	M	SD	M	SD	t	df				
	0.56	1.15	1.37	1.40	-5.01	335		<0.001		

* $M_{\Delta}= M_{T0}-M_{T1}$.

** two-sided.

Table 7
Skills development (full population).

	T0			T1			Paired samples t-test		
	M	SD	N	M	SD	N	t	df	Two-sided p
I keep working, even when it's difficult	3.86	0.98	333	3.90	1.00	333	-0.636	332	0.525
I am confident that everything will work out	3.95	1.02	331	3.98	1.08	331	-0.384	330	0.701
I know what I'm good at	4.37	0.97	328	4.33	0.95	328	0.674	327	0.501
I like it when I can solve a difficult problem by working hard	4.08	1.05	329	4.15	1.03	329	-0.968	328	0.334
I often have ideas to solve problems	3.66	1.09	329	3.84	1.12	329	-2.941	328	0.004
I can present my ideas well	3.34	1.19	330	3.62	1.20	330	-4.454	329	<0.001
I work well with other children	4.28	0.86	332	4.21	1.00	332	1.201	331	0.231

Table 8
Skills according to gender.

a. 'I am confident that everything will work out'									
Gender						Independent samples t-test			
Girls			Boys						
	N	M	SD	N	M	SD	T	df	Two-sided p
T0	165	3.80	1.07	155	4.15	0.90	-3.20	318	0.002
T1	162	3.93	1.02	157	4.03	1.16	-0.82	317	0.414

b. 'I know what I'm good at'									
Gender						Independent samples t-test			
Girls			Boys						
	N	M	SD	N	M	SD	t	df	Two-sided p
T0	165	4.16	1.07	155	4.55	0.83	-3.63	318	<0.001
T1	161	4.24	0.93	157	4.40	0.98	-1.48	316	0.139

c. 'I can present my ideas well'									
Gender						Independent samples t-test			
Girls			Boys						
	N	M	SD	N	M	SD	t	df	Two-sided p
T0	166	3.22	1.19	156	3.48	1.16	-1.96	320	0.050
T1	162	3.56	1.16	156	3.75	1.23	-1.41	316	0.161

Table 9
Development of attitude.

	T0		T1		Paired samples t-test		
	M	SD	M	SD	t	Df	Two-sided p
I think it is important to take good care of nature	4.30	0.95	4.36	0.95	-1.180	334	0.239
I think it is important to take good care of the people around me	4.34	0.87	4.32	0.87	-0.373	332	0.709
I think it's important to know where my food comes from	3.98	1.22	4.11	1.08	-1.789	330	0.075
I think it's important to know what happens to my things after I throw them away	3.53	1.40	3.56	1.35	-0.368	334	0.713
I think companies can help solve big problems in the world	3.71	1.22	4.03	1.01	-4.400	330	<0.001

multiple answers. These are classified under each of the categories mentioned.

The most frequently mentioned category of answers related to the theme of the lessons: chocolate (mentioned 68 times) and recycling /

Table 10
Development of intentions.

	T0		T1		Paired samples t-test				
	M	SD	N	M	SD	N	t	df	Two-sided p
I think it would be nice to have my own company in the future	4.10	1.14	327	3.79	1.34	327	4.57	326	<0.001
Later when I start working, I want to earn as much money as possible	4.58	0.77	323	4.60	0.83	323	-0.33	322	0.745
Later when I start working, I want to help to solve big problems in the world	4.04	1.12	324	4.12	1.00	324	-1.23	323	0.219
In the future, I want to work in a company that helps solve big problems in the world	3.55	1.30	325	3.62	1.22	325	-0.864	324	0.388
In the future, I want to have my own company that helps solve big problems in the world	3.63	1.35	328	3.54	1.37	328	1.15	327	0.250

upcycling (mentioned 118 times), respectively.

Example statements about chocolate are:

- o *I have learned that the manufacturer and the middleman get more money than the farmers.*
- o *That the farmers are not paid fairly, in other words: the chocolate world is not fair.*
- o *Where chocolate comes from and how to make chocolate.*

Example statements about recycling/upcycling are:

- o *That you turn things that you don't use into other things.*

Table 11
Development 'I think it would be nice to have my own company in the future' according to gender.

	Girls		Boys		Independent samples t-test		
	M	SD	M	SD	t	df	Two-sided p
$M_{\Delta} (=M_{T1}-M_{T0})$	0.17	1.18	0.46	1.30	2.04	311	<0.041

Table 12
Evaluation questions (T1).

	M	SD	N
I learned new things in the entrepreneurship lessons	4.26	1.04	356
I had fun during the entrepreneurship lessons	4.14	1.12	356
I am proud of what we have achieved	4.24	1.01	357
I know better what I'm good at because of the entrepreneurship lessons	3.84	1.25	356

Table 13

Main learning in the entrepreneurship lessons (categorized, multiple answers possible, N = 319).

Category	No. of times mentioned
Theme of the lessons – recycling / upcycling	118
Theme of the lessons – chocolate	68
Entrepreneurship	35
Sustainability / environment / nature	27
Learning new skills	26
Practical matters	16
Money	13
Negative answers	9
Various answers	25

- *That recycling is good for the environment.*
- *I have learned that it is better to reuse your waste.*

The next category is entrepreneurship. Starting a business was explicitly mentioned by 35 children, for example as follows:

- *How to start a company*
- *How to start your own business*
- *How to handle money and how to start a business*

The other answers are summarized in Table 13. The nine children who gave an explicit negative answer, for example wrote ‘I did not learn anything’; and finally there were 25 various answers.

Both surveys also offered the opportunity to provide additional input through an open question. At T0, we asked ‘Would you like to say something more about this questionnaire?’ In total, 188 out of 412 children (46%) provided a response. These were mostly comments like ‘filling in this questionnaire was fun’, ‘it was easy’, or ‘no’.

At T1, we asked ‘Would you like to say something more about this questionnaire or the program?’ 228 out of 375 children (61%) provided a reply. Just over half of all children who replied (118; 52%) answered ‘no’; and 14 answers were unclear. The remaining 96 replies were categorized. The majority of these answers (58, 60%) referred to the lessons being ‘fun’. Some children provided more input, for example:

- *The people who organized this are champs. Children should be asked questions more often. These projects are great fun and should be done more often.*
- *I liked the entrepreneurship lessons and they need to continue in the future*

Six children explicitly commented on the questionnaire and nine children provided negative comments, for example ‘it was boring’ or ‘the teacher was very strict’. The remaining 23 answers were varied, with some examples below:

- *I don't want to have a business because I'm going to be an astronaut and then I'm going to space so I'm not on Earth*
- *I don't care how much I earn. I think it's important if I'm happy*
- *I liked it, especially because you were allowed to be stubborn and free, besides that I felt a bit older than I am*
- *I really learned a lot from this and will also be much more careful with nature from now on*

5.8. Highlights from group discussions and parent interviews

Finally, some results from the group discussions and parent interviews are briefly presented. Parents had to give active informed consent for their children to participate; this severely limited the selection of children for these sessions and results may not be representative for the full population. Still, two results deserve mention.

First, with regard to *knowledge*, entrepreneurship came up as an important learning topic in many group discussions; and some parents

indicate in interviews that their children have proudly told about their new entrepreneurial knowledge. The group discussions also provided a number of examples where children now link entrepreneurship to social goals.

Second, regarding *intentions*, some children and parents indicate that they are not yet ready for the question. Some children say they don't know yet if they want to be entrepreneur, some parents say their child is too young to know. Other children, however, have already thought carefully about starting a business, and about the balance between making money and doing something good for the world.

6. Discussion, conclusions and recommendations for further research

This study provides valuable insights into effects of an educational program on social and sustainable entrepreneurship for children. The children's perceptions were central to the study, and this focus in itself already forms a novel research approach. Generally speaking, the children clearly appreciate the Fawaka programs, had fun, are proud of what they have achieved and say they have learned new things, particularly with regard to entrepreneurship.

Regarding the effects of the program, the most striking changes between the start (T0) and the end of the program (T1) are seen around *knowledge, skills and intentions*. There is little change with regard to *attitude*. This is perhaps not too surprising, given that the program only lasted six weeks on average.

Regarding *knowledge*, it is clear that the children feel that they have learned about entrepreneurship. The largest increase in scores is seen with respect to the statement ‘I know a lot about how to start a business’. It is difficult to compare this result with previous research, as we only focused on the children's own perception of their knowledge. In future research, test questions for the children and/or data collected from teachers could provide a richer set of data on this topic.

Regarding *skills*, focus was on non-cognitive skills important for entrepreneurship. Previous research into this was inconsistent: sometimes positive effects were found, sometimes negative effects and sometimes no effects (Brüne & Lutz, 2020, p. 280). On average, children in the Fawaka programs already perceive themselves quite high-skilled before the program and there is little difference afterwards. However, when differentiating on gender, striking results appear that clearly differ from previous research. Self-confidence of girls increases compared to boys, as shown in scores on the statements ‘I know what I'm good at’ and ‘I am confident that everything will work out’. Significant differences with boys before the program have disappeared after the program. In contrast, earlier research into EE pointed out that self-efficacy (belief in one's own abilities) increased in boys and decreased in girls (Brüne & Lutz, 2020). For example, the study by Bergman et al. (2011) investigated a competitive entrepreneurship program for children between the ages of 12 and 17, in which the ‘best’ company was awarded a prize at the end of the program. The researchers concluded that girls did not consider themselves competitive and aggressive enough for entrepreneurship. The Fawaka program is clearly different in terms of content and set-up (as well as age group) and produces a very different result.

Regarding *intentions*, a similar pattern is observed. For the full population, there is a striking decrease in score on the statement ‘I think it would be nice to have my own company in the future’. This is in line with findings from previous research on the ‘sorting effect’ (Von Graevenitz et al., 2010). However, striking results appear again when differentiating on gender. Girls become relatively more enthusiastic about an own company compared to boys; arriving at a higher final score. Previous EE research contrastingly showed a relative decrease of entrepreneurial intentions among girls compared to boys (Shinnar et al., 2014, p. 566). Comparisons are again difficult however, as the target group of the previous research was college students, and the content was not focused on social and/or sustainable entrepreneurship.

Perhaps the most important contribution to entrepreneurship

education theory is found in the results on skills and intentions with regard to gender. This study provides important clues that a program focused on sustainable and social entrepreneurship leads to different results than more 'general' programs on entrepreneurship. After the program, differences in entrepreneurial intentions between girls and boys are significantly smaller, in clear contrast to findings in earlier EE studies. In addition, a number of differences between girls and boys with regard to self-confidence that are significant before the program, disappear after the program. This calls for further, more detailed research, for example directly comparing 'regular' EE with EE specifically aimed at social or sustainable entrepreneurship.

Finally, it is good to once again note that these results are mostly based on the participating children's own perceptions. It was a deliberate choice to focus on participants' perceptions, as this formed a gap in the existing literature. While this focus produced interesting results, the methodological setup of this study led to five limitations, that could be addressed in follow-up research.

- 1 Control group.** The one-group pre-test / post-test set-up without control group poses threats to internal validity. Using a control group for follow-up research is recommended.
- 2 Additional data sources.** Measurement of development through children's self-evaluation poses limits. Difference in scores between T0 and T1 were interpreted as development, but the children were not explicitly asked about development and were not shown their previous scores. Collecting additional data from teachers, who may have a more complete overview of the development of children in their class, is recommended for future research.
- 3 Long-term effects.** Timing of data collection implies that only short-term effects can be identified. Data were collected immediately before and after the program. For future research, it is recommended to follow children who participate in the program for a longer period of time.
- 4 Specification.** Measurement around differentiating variables could be improved. Significant differences between subgroups were found with regard to children saying they do or do not know an entrepreneur. Follow-up research could clarify the relation to the entrepreneur. Also, more detailed questions could be asked about previous lessons on entrepreneurship.
- 5 Comparing different contexts.** This study was done in The Netherlands. Future research could examine the extent to which the results of programs depend on the specific design and context, so that knowledge about good practices is exchanged and ultimately more impact can be made.

Ethics and informed consent

Permission for the study was obtained from the Research Ethics Committee of the university (ref 2021-002596). The informed consent procedure is detailed in the methods section.

Declaration of Competing Interest

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Supplementary materials

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