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A report on the building process of a survey instrument

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Summary

This report provides an overview of a survey instrument that aims to measure the Finnish ninth grade pupils' perception of their entrepreneurial selves. The aim is to review the validity and reliability issues of this survey instrument. This report is related to a national research project, which will be conducted in Finland during 2019–2022. The research is funded by the Yksityisyrittäjäin Säätiö (Foundation for Private Entrepreneurs). The target group of this research is all Finnish ninth graders (15–16-years-olds) and it covers young people born in 2005, 2006 and 2007. The research survey is a web-based online study.

Tiivistelmä

Suomessa toteutetaan vuosina 2019-2022 kansallinen yrittäjyyskasvatukseen kytkeytyvä tutkimus, jonka kohderyhmän muodostavat yhdeksäsluokkalaiset nuoret. Tutkimus on selainpohjainen kysely. Tutkimuksen rahoittaa Yksityisyrittäjäin säätiö. Tutkimuksen osallistuvat vuosina 2005, 2006 ja 2007 syntyneet nuoret. Tässä raportissa tarkastellaan kyselyyn ja sen rakentamiseen liittyviä kysymyksiä. Tutkimuksen tavoitteena on selvittää nuorten käsityksiä omista yrittäjyysvalmiuksistaan.

Keywords: Entrepreneurship, entrepreneurship education, survey instrument

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1. Introduction

In Finland, entrepreneurship education has been part of the basic education curriculum since the early 1990s. Individual entrepreneurial knowledge, skills and attitudes have been identified as the key elements of individuals' working life competence (European Commission, 2006; 2012; Finnish National Agency for Education 2016; Gibb 2007; Mwasalwiba 2010; Obschonka et al. 2017). The Finnish education system consists of early childhood education, pre-primary education, basic education, general upper secondary education, vocational education, higher education and adult education (Ministry of Education and Culture, Finnish National Agency for Education 2018). The target group for this study consists of pupils in the last grade of basic education.

Previously, Finnish entrepreneurship education researchers have been interested in the methods of entrepreneurship education used by teachers (e.g. Seikkula-Leino et al. 2010; Ruskovaara and Pihkala 2013; 2014), teachers' entrepreneurial competencies (e.g. Peltonen 2008; 2015) and, in recent years, the management of entrepreneurship education and the role of principals in entrepreneurship education (Hämäläinen et al. 2018). In addition, the entrepreneurial intentions of Finnish higher education students have been studied in recent years (e.g. Joensuu-Salo et al. 2015). Komulainen et al. (2013) have studied ninth graders' perceptions about entrepreneurship in their research. However, research concentrating on entrepreneurship education in basic education has had a minor role.

2. The theoretical framework behind the survey instrument

The literature on entrepreneurship education research does not unequivocally answer the question of how a young person's perception of his or her 'entrepreneurial self' can be studied. However, being entrepreneurial is understood as competence that applies to all spheres of life (European Commission, 2005; 2012). Being entrepreneurial may be manifested in various ways and, as Welter and Smallbone (2011) argued, being entrepreneurial needs to be interpreted in the context in which it occurs.

In this research, the entrepreneurial self of ninth graders is approached though several theoretical frameworks. Prior research on the 'entrepreneurial individual' specifies that, in particular, innovativeness, creativity, risk-taking and proactiveness seem to be the central dimensions of the entrepreneurial self, along with opportunity recognition and opportunity exploitation (Athayde 2009; Bolton and Lane 2012; Bridge et al. 2003, 37; Donellon et al. 2014; Gartner 1988; Kašperová and Kitching 2014; Lumpkin and Dess 1996; Man et al. 2002; Rae 2007; Rauch et al. 2009). Based on a literature review, we ended up with a set of concepts that, in our opinion, describe the 'entrepreneurial self of the ninth grader'. It should be noted that these concepts are interrelated and have no hierarchy in this research. The relationships between the concepts have not been examined. The key concepts of this research and references behind them are presented in Table 1.

Table1. The key concepts behind the survey instrument.

Concept		References
Self-efficacy	The concept of self-efficacy applies to the judgements people formulate about their capacity to act in specific situations. Self-efficacy is a personal attribute which is found to be an important antecedent to entrepreneurship.	Bandura (1977; 1997); Boyd & Vozikis (1994); Markman & Baron (2003); McGee et al. (2009)
Locus of control and need for achievement	Locus of control refers to how much an individual thinks he or she can influence the course of his or her life. The need for achievement (N-Ach) is a concept that refers to an individual's desire to work to achieve goals.	Boyd & Vozikis (1994); Hermans (1970); McClelland (1961); Oosterbeek et al. (2010); Rae 2007; Rotter (1966); Weiner & Kukla (1970); Wigfield & Eccles (2000)
Risk tolerance	Risk tolerance is a personal feature that refers to an individual's way of acting when he or she faces measures that include personal risk.	Atkinson (1957); Brockhaus (1980); Karabulut (2016); Sitkin et al. (1992)
Perseverance	The concept of perseverance refers to an individual's desire to try to achieve goals. It also includes the individual's way of reacting when adversity arises and things do not go as desired.	Eisenberger et al. (1992); van Gelderen, M. (2012); Markman et al. (2005)
Creativity	Creativity is an individual's ability to make something new out of the available information or materials.	Amabile (1983); Kirzner (2009); Runco (1993); Schumpeter (1934, 90–94)
Resilience	The concept of (entrepreneurial) resilience refers to how an individual manages setbacks and challenges.	Korber & McNaughton (2017)
Financial literacy	The concept of financial literacy refers to an individual's ability to understand and apply financial skills and knowledge in their lives.	Chen (1998); Huston (2010); Pavković et al. (2018); Zokaityte (2017)
Tolerance of ambiguity	Tolerance of ambiguity is understood as the way an individual perceives and processes information about unclear situations.	Furnham & Ribchester (1995)
Opportunity identification	Identifying the opportunities for new businesses is seen as important ability of a successful entrepreneur.	Ardichvili et al. (2003); Ozgen & Baron (2007)
Leadership	Entrepreneurial leadership refers to making plans, building vision and mobilising recourses.	Athayde 2009; Gupta et al. (2004); Kuratko & Hornsby (1998)

Several existing survey tools have been utilised in the construction of the measurement tool. However, no research questions or research design have been directly utilised in this research. In part, this is since few studies have directly targeted the young age group. In addition to the surveys presented in Table 2, in this research is the School Health Promotion Study (Finnish Institute for Health and Welfare 2019), the PISA research (OECD 2020) and the Youth Barometer (State Youth Council 2020).

Table 2. Other measurements utilised in the present study.

Reference	Key words
Antoncic, B., Bratkovic Kregar, T., Singh, G., & DeNoble, A. F. (2015). The big five personality–entrepreneurship relationship: Evidence from Slovenia. *Journal of Small Business Management*, 53(3), 819–841.	Personality, entrepreneurship, entrepreneur, non-entrepreneur
Asghar, M.Z., Gul, F., Hakkarainen, P.S., Zeki Taşdemir, M. (2019). Validating entrepreneurial intentions questionnaire to assess the impact of entrepreneurship education. *Egitim ve Bilim*, Vol 44: 197, 383-399.	Impact assessment, entrepreneurship education
Athayde, R. (2009). Measuring enterprise potential in young people. *Entrepreneurship Theory and Practice*, 33(2), 481–500.	Entrepreneur, creativity, personal control, achievement, intuition, leadership, adolescent
Bolton, D. L., & Lane, M. D. (2012). Individual entrepreneurial orientation: Development of a measurement instrument. *Education+ Training*, 54(2/3), 219-233.	Individual entrepreneurial orientation (IEO)
Bolton, D. L. (2012). Individual entrepreneurial orientation: Further investigation of a measurement instrument. *Academy of Entrepreneurship Journal*, 18(1), 91.	IEO
Bosscher, R.J., Smith, J.H. (1998). Confirmatory factor analysis of the General Self-Efficacy Scale. *Behaviour Research and Therapy,* 36, 339–343.	General self-efficacy
Chen, G., Gully, S.M. & Eden, D. (2001). Validation of a New General Self-Efficacy Scale. *Organizational Research Methods* 4; 62., 62- 81.	Self-efficacy
Cubico, S., Bortolani, E., Favretto, G., & Sartori, R. (2010). Describing the entrepreneurial profile: the entrepreneurial aptitude test (TAI). *International Journal of Entrepreneurship and Small Business*, 11(4), 424–435.	Entrepreneurial aptitude, entrepreneurial profile
Davis, M. H., Hall, J. A., & Mayer, P. S. (2016). Developing a new measure of entrepreneurial mindset: Reliability, validity and implications for practitioners. *Consulting Psychology Journal: Practice and Research*, 68(1), 21–48.	Entrepreneurial mindset
Goldberg, L. R. (1990). An Alternative 'Description of Personality': The Big Five Factor Structure. *Journal of Personality and Social Psychology,* 59, 1216–1229.	Personality, the "Big Five" personality types
Hermans, H.J.M. (1970). A questionnaire measure of achievement motivation. *Journal of Applied Psychology*, 54(4), 353–363.	Achievement motivation
Kolvereid, L. (1996). Organizational employment versus self-employment: Reasons for career choice intentions. *Entrepreneurship Theory and Practice,* 20(3), 23–31.	Entrepreneurial intention, entrepreneurial attitude, the theory of planned behaviour
Kolvereid, L. (1996). Prediction of employment status choice intentions. *Entrepreneurship Theory and Practice*, 20(3), 45–57.	Entrepreneurial intention, entrepreneurial attitude
Laguna, M. (2013). Self-efficacy, self-esteem, and entrepreneurship among the unemployed. *Journal of Applied Social Psychology,* 253–262.	Self-efficacy, self-esteem, entrepreneurship, unemployed
Langkamp Bolton, D., and Lane, M.D. (2012). Individual entrepreneurial orientation: Development of a measurement instrument. *Education + Training,* 54(2/3), 219–233.	Individual entrepreneurial orientation
Marques, A.P. (2019). Higher education and assessment of entrepreneurial skills by academic stakeholders. *European Journal of Education*, 2(1), 54–61.	Assessment, entrepreneurial skills
McNally, M. (1996) Toward rigor and parsimony: A primary validation of Kolvereid's (1996) Entrepreneurial Attitudes Scales. *Entrepreneurship and Regional Development,* 28(5–6), 358–379.	Entrepreneurial attitude

McGee, J.E., Peterson, M., Mueller, S.L., Sequira, M.J. (2009). Entrepreneurial self-efficacy: Refining the measure. *Entrepreneurship Theory and Practice*, 33(4), 965–988.	Entrepreneurial self-efficacy
Polat, H. (2018) Analyzing entrepreneurship skill levels of the 3rd grade primary school students in life sciences course based on different variables. *International Education Studies*, 11(4), 63–73.	Entrepreneurship skill, life sciences, primary school
Räty, H., Komulainen, K., Hytti, U., Kasanen, K., Siivonen, P. & Kozlinska, I. (2019). University students' perceptions of their abilities relate to their entrepreneurial intent. *Journal of Applied Research in Higher Education*, 11(4), 897–909.	Entrepreneurial intent, ability, perception
Schelfhout, W., Bruggemana, K. & De Maeyerb, S. (2016). Evaluation of entrepreneurial competence through scaled behavioural indicators: Validation of an instrument. *Studies in Educational Evaluation,* 51, 29–41.	Entrepreneurial competence
Tourè-Tillery, M. & Fishbach, A. (2014). How to measure motivation: A guide for the experimental social psychologist. *Social and Personality Psychology Compass*, 8/7, 328–341.	Motivation, self-reporting data

3. From theory to a survey instrument

The survey instrument was constructed in multiple phases over 2019 and 2020. Different steps of the survey construction process are carefully documented. Understanding the process is thought to increase the reliability and the validity of the study. There have been three key actors in the building process: representatives of the target group, actors in the Finnish educational field, and teachers and principals.

There is a clear rationale for involving different groups in building this survey instrument. Ninth graders' participation in the building process affects the reliability and validity of the research. The teachers and principals play a key role in carrying out the research. It was important to hear their voices before conducting the research. The Ministry of Education, the Finnish National Agency for Education and third-sector actors are able to make concrete use of the results of the study. So, the aim has been to involve all the key actors in the preparation of the survey instrument so that it meets the needs of different actors and the effectiveness of the research increases.

Interviews

Qualitative methods (Flick 1998, 137–138) have been utilised in the building process of the survey instrument. The interviews increased the understanding of the target group. This research is based on abstract concepts, and conceptualising them into language that is suitable for a young person can be challenging. Podsakoff and Organ (1986) argued that a researcher can never be sure that the respondent has understood questions correctly. It was necessary to pay attention to the word choices and form of the questions. The interviews made sure the young people's voices were heard. The interviews were semi-structured, and they were recorded and transcribed. There were seven interviewees (aged 14–16).

Feedback from stakeholders

After the interviews, the first version of the questionnaire was created. This questionnaire was discussed with the representatives of the Finnish National Agency for Education and the Ministry of Education and Culture in Finland. In addition, the questions were discussed with representatives of the Junior Achievement organisation. Feedback was received from them on the totality of the survey and how it fits the goals of the basic education curriculum.

The first test round

After these discussions with the different parties, part of the survey was tested in one municipality in Finland as part of another survey. One hundred and nineteen ninth graders answered the survey. In this context, it was found that the pupils' motivation to respond decreases significantly after question number 30. As a result, the number of questions was limited to thirty-five in total (including background questions and research questions). After the first test it was decided to use a five-point Likert scale for the survey (*I completely agree – I do not agree or disagree – I completely disagree*).

Several steps, several stages

Table 3 shows the different stages of involving the target group and the stakeholders in the survey tool-building process (including the test survey mentioned above), all the devices used in the tests and some notes from the test events. In test events, ninth graders provided feedback on the content, structure and visual appearance of the survey. In addition, the involvement of young people has provided perspectives on the functionality of the technical solution and database in general. Eight of the meetings were attended by a person taking notes and helping students to answer the questionnaire. The number of different events was not precisely planned in advance. After six test events with students, the feedback material collected had achieved saturation point. It was found that the feedback repeated quite similarly from one event to another and no new observations emerged.

Table 3. Different phases of the building process in chronological order

	Event	**Pupils/responses**	**Used device**	**Notes**
1	May 2019, south-western Finland	450 pupils / 119 responses	Webropol	The survey had a total of 78 questions. The three themes of the survey were technology education, environmental education and entrepreneurship education. The 12 research statements were loaned from the measurement tool presented in this report.
2	September and October 2019	2 pupils and several adults several times / responses not stored in the database	Mobile phone, computer and tablet computer using Android and Apple devices	General preparatory testing with different devices and browsers. Feedback was collected. These answers were not stored in the database.
3	November 5, 2019, southern Finland	25 pupils / 25 responses, 1 teacher	Mobile device (the student's	Oral and written feedback were collected. Observation.

			phone) and one answer on paper	Some technical features did not work. Problems with the database.
4	November 5, 2019, southern Finland	20 pupils / 26 responses, 1 teacher	Mobile device (the student's phone) and one answer on paper	Oral and written feedback were collected. Observation. Some technical features did not work. The database worked well.
5	November 11, 2019, southern Finland.	26 pupils / 26 responses, 1 teacher	Mobile device (the student's phone)	Oral and written feedback were collected. Observation. All the technical features worked.
6	December 3, 2019, northern Central Finland	18 pupils / 18 responses	Mobile device (the student's phone)	Oral and written feedback were collected. Observation. All the technical features worked.
7	December 3, 2019, northern Central Finland	23 pupils / 23 responses	Mobile device (the school's tablet computer)	Oral and written feedback were collected. Observation. All the technical features worked.
8	December 4, 2019, northern Central Finland	23 pupils / 23 responses	Mobile device (the student's phone)	Oral and written feedback were collected. Observation. All the technical features worked.
9	December 4, 2019, northern Central Finland	11 pupils / 11 responses	Mobile device (the student's phone)	Oral and written feedback were collected. Observation. All the technical features worked.
10	December 18, 2019, south-western Finland	119 pupils / 117 responses, 1 teacher.	Mobile device (the student's phone)	Oral and written feedback were collected. Observation. All the technical features worked.
11	January 2020, two cities, southern Finland	Approximately 1400 pupils, 701 respondents	Mobile device (the student's phone)	The database was tested with a large amount of data. Our team was not present at this event.
12	April 2020, several cities, all parts of Finland	1857 respondents	*N*ot known	Testing the database with a large amount of data. Our team was not present at this event.

The actual research survey is a web-based online study. The student uses a phone, tablet computer or computer to answer. The questionnaire is answered in the classroom under the guidance of a teacher. The address of the survey is sent to schools through the Finnish National Agency of Education. The student does not register or log in to the survey before answering. The survey is openly available online. LUT University does not collect or store the IP address or other similar identifying information of the respondent in the database.

Some reliability and validity questions

There are several reliability and validity issues involved in conducting this survey. First, the questionnaire uses an open web address. It is possible that someone who is not supposed to answer the questionnaire may answer it. For this reason, the questionnaire is answered under the guidance of a teacher in the classroom. It is known that the school day usually takes place

between 8 am and 3 pm. In addition, the school holidays are known. If many responses are stored in the database at an unusual time, it will be noticed. If the number of responses from a municipality clearly exceed the number of ninth graders in the municipality, it will be noticed. It is possible to trace the number of ninth graders in different cities. A school may have given the questionnaire to someone other than the ninth-grade pupils. It is not possible to identify or prevent this. However, the marketing of the survey has tried to emphasise that only ninth graders are taken into account in the implementation of the survey.

Second, due to Covid-19, some pupils may have been doing distance learning during the pilot study in spring 2020. It is also possible that pupils were doing distance learning during the actual survey rounds later. Distance learning could affect the implementation of the study. If the questionnaire is sent to pupils doing distance learning, the survey can be answered by, for example, another family member or a friend.

Third, when the questionnaire is answered at school as part of the lesson, it may cause social pressure. It is possible to control this to some extent by comparing response times. Based on the information gathered from different test sessions, it is known how long it takes to respond to this survey. Response time was found to be between four and nine minutes. In the test events, it was also observed how quickly the questionnaire opens, whether young people get frustrated, how they move from one page to another and what things young people pay attention to when answering. This is one way to assess the reliability of the study.

The respondent's motivation to respond to the survey affects the reliability of the survey. If there are a lot of questions or if the technical solution does not work properly, the respondent might get bored and quit answering. To make the questionnaire more convenient to answer, the questions are divided into groups and the respondents can track their progress. There are six to nine questions on one page. The feedback form pupils have been considered in the questions' wording (it is easy to understand) and in the length of the questions (the questions fit on a mobile phone screen). The first group of questions includes background questions. This is followed by statements divided into four pages, which are answered on a five-point Likert scale.

With feedback, better reliability

The building process of the survey provided information that has helped to increase the reliability of the study. With the help of the observation material, it was possible to correct the small defects hidden in the technical solution. Various possibilities for error were made visible in the observation when the respondent was trying to use the survey instrument. For example, some students typed the address into the Google search box instead of the browser's address bar. This redirected the student to the wrong page. As a result, the instructions were refined with the help of feedback that teachers provided.

During the process it was checked if the responses were stored in the database correctly. Also, the different answer options were tested: test persons always selected the same Likert option and checked that the answer remained the same in the database as well. It has been checked that the report does not show any impossible response alternatives. Several devices were used for testing: a desktop computer, a laptop, an iPad, an Android tablet, different mobile phones and different browsers (Mozilla, Explorer, Edge, Chrome, Safari) on different devices.

4. The pilot study

The pilot study was carried out in collaboration with third-sector actors. The questionnaire was sent to dozens of different schools with which the organisations are actively cooperating. This may have had some effect on the pilot data and should be considered when the data is analysed. In autumn 2020 the actual research questionnaire was sent centrally to all secondary schools and to the organisers of teaching, the Finnish National Agency for Education. LUT University does not manage school contact information. The database generates a report in Excel format. Excel files are transferred to SPSS. The answer options to questions 10–35 are 1–5 (on a Likert scale). Other answer options are presented in Table 4.

Table 4. Response options for questions 1–9.

Question/instruction	**Response options**
Gender	Female / male / prefer not to answer
Where do you primarily apply after primary school?	Vocational institution / general upper secondary school / voluntary additional year of basic education (10th grade) / other
Select the municipality in which your school is located	List of Finnish municipalities
Which of the following hobbies are you doing regularly?	Music / sports / taking care of your pet / going to movies and concerts / drawing, painting or photographing / reading / playing computer games or playing console games / blogging, vlogging or tubing / organised activities (e.g. Scouts, 4H youth work) / other hobbies / I don't have any regular hobbies
What is your latest grade in your mother tongue? If you don't remember your latest grade, select the one nearest to your skill level.	4/5/6/7/8/9/10
What is your latest grade in mathematics? If you don't remember your latest grade, select the one nearest to your skill level.	4/5/6/7/8/9/10
Are there entrepreneurs in your family?	Mother / father / grandparent / sister or brother / another person close to me / there are no entrepreneurs in my family or close ones
Have you visited the Yrityskylä (Me and my city) learning environment?	Yes / no / I can't tell
Have you taken part in Junior Achievement (JA) activities?	Yes / no / I can't tell

5. A description of the pilot data

The following describes how the pilot data was examined. First, the data was processed the data has been processed in Excel. In Excel, errors within the data have already been checked. After this, the data is transferred to the SPSS programme. In SPSS, the review began with a search for systematic errors (frequencies used). In the following table (Table 5), the pilot data are presented from the perspective of the background variables. The responses to test events 10, 11 and 12 are used (see Table 3).

Table 5. A description of the respondents

Gender	Girls: 54.2 % (*N* = 1387) Boys: 43.1 % (*N* = 1103) Prefer not to answer: 2.7 % (*N* = 68)		Children born in year 2004 (*N* = 57 758): Girls: 48.6 % (*N* = 28 074) Boys: 51.3 % (*N* = 29 684) The girls are slightly over-represented in the data (Statistics in Finland 2020). Previous research states that gender plays a role in an individual's attitude toward entrepreneurship (e.g. Sánchez-Escobedo et al. 2011).
School grades (response options 4–10)	Mother tongue: mean 8.10	4: 0.5 % (*N* = 12) 5: 1.8 % (*N* = 45) 6: 7.4 % (*N* = 189) 7: 19.4 % (*N* = 495) 8: 29.7 % (*N* = 759) 9: 31.7 % (*N* = 812) 10: 96 % (*N* = 246)	Completely reliable data on the school grades of Finnish ninth graders is not available. In various studies, it has been between 7–8 in both mathematics and mother tongue studies. In this case, the distribution of grades is slightly skewed. In previous research differences by gender in Finnish ninth-grade pupils school grades are found. It is possible that the higher number of girls in this study affects the mean school grades (FINEEC 2020; Lappalainen 2011).
	Mathematics, mean 8,02	4: 08 % (*N* = 20) 5: 3.4 % (*N* = 86) 6: 13.3 % (*N* = 339) 7: 18.8 % (*N* = 481) 8: 20.1 % (*N* = 514) 9: 27.1 % (*N* = 694) 10: 16.6 % (*N* = 424)	
School choice after basic education	Vocational institutions: 31.2 % (*N* = 799) General upper secondary school: 66.1 % (*N* = 1690) Voluntary additional year of basic education: 0.3 % (*N* = 7) Other: 2.4 % (*N* = 62)		In 2018, about 53 % of ninth-graders applied to general upper secondary school and 46 % applied for vocational education. In our data, high school applicants are slightly over-represented.
Regular hobbies	Have a regular hobby: 93.2 % (*N* = 2385) Do not have a regular hobby: 6.8 % (*N* = 173)		According to the Finnish School Health Promotion Study, 95.5 % of young people in Grades 8–9 have a regular hobby (Finnish Institute for Health and Welfare 2019).

Are there entrepreneurs in the family?	*Yes*: 47.9 % (*N* = 1225) *No*: 52,1 % (*N* = 1333)	In terms of numbers, it is not possible to look at the accuracy of the answers given by ninth graders. However, it is known from previous research literature that family background has an impact on an an individual's perceptions of entrepreneurship (e.g. Marques et al. 2018; Matthews and Moser 1995).
Have you visited the Yrityskylä?	*Yes*: 62.1 % (*N* = 1588) *No*: 29.3 % (*N* = 750) *I do not know*: 8.6 % (*N* = 220)	About 80 % of sixth-graders in Finland visit the Business Village every year. About 65 % of ninth-graders in Finland visit the Business Village every year (Economy and Youth TAT 2020).
Have you taken part in Junior Achievement activities?	*Yes*: 6.1 % (*N* = 155) *No*: 73.3 % (*N* = 1875) *I do not know*: 20.6 % (*N* = 528)	Junior Achievement's operations reach about 35 % of educational institutions in Finland. All school levels are included in this number (Nuori yrittäjyys ry 2020).
Respondents from 68 municipalities		

It should be noted that some municipalities have only one or two answers. Some respondents chose the wrong municipality for some reason. The data has also been checked from the perspective of so-called outliers. There are individual, clearly distinct answers. A closer look showed that these respondents have spent a significantly short time on responding (less than two minutes). This has probably affected the responses. In the following, the data is described using different key figures. The goal is to give an overview of the normality of the data. The KMO for the variables is .904. Based on the key figures in Tables 7, 8 and 9, it can be concluded that the data is not significantly skewed or peaked. KMO is at a good level and it seems that there is no common method bias.

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		*.904*
Bartlett's Test of Sphericity	Approx. Chi Square	24435.116
	df	325
	Sig.	.000

Table 6. The mean, median and mode (*N* = 2558)

Item	Mean	Std deviation	Median	Mode
I have set myself goals related to school and/or hobbies	4.16	.903	4.00	4
I can affect my life	4.03	.804	4.00	4
I know where I am good at	3.86	.870	4.00	4
I know that I am able to complete difficult projects and/or tasks	3.81	.888	4.00	4
I am persistent	3.77	.899	4.00	4
When I try out something new, I am not afraid to take risks	3.71	.841	4.00	4
I want to do things better than others	3.62	1.002	4.00	4
I have faith in myself	3.59	1.012	4.00	4
I am creative	3.58	.981	4.00	4
School has offered me adequate information on entrepreneurship	3.35	.944	4.00	4
I work well under pressure	3.26	1.049	3.00	4
In my circle of friends, I am the one who has new ideas	3.26	.883	3.00	3
Company co-operation is very useful to me	2.89	.866	3.00	3
We often discuss issues related to entrepreneurship at school	2.80	.941	3.00	3
We often discuss issues related to entrepreneurship at home	2.58	1.131	2.00	2
We have a lot of co-operation with companies at our school	2.52	.846	3.00	3
We often discuss issues related to entrepreneurship with friends	2.28	1.048	2.00	2
I avoid situations where I do not know what to do	2.56	.957	3.00	3
I keep my goals, even when I face obstacles	3.67	.797	4.00	4
I am able to change my actions flexibly in changing situations	3.62	.757	4.00	4
I think I could work as an entrepreneur	3.23	1.072	3.00	3
It would be great if I could become an entrepreneur	3.23	1.079	3.00	3
I understand how the economy works in an enterprise	3.12	.998	3.00	3
I am able to plan a project	2.81	1.031	3.00	3
I am able to draw a business plan	3.40	.933	4.00	4
I want to establish a company in the future	2.70	.997	3.00	3

Table7. The minimum, maximum, skewness and kurtosis (*N* = 2558)

			Skewness		Kurtosis	
	Min.	Max.	Statistic	Std Error	Statistic	Std Error
School has offered me adequate information on entrepreneurship	1	5	-.514	.048	-.202	.097
We have a lot of co-operation with companies at our school	1	5	.059	.048	-.077	.097
Company co-operation is very useful to me	1	5	-.329	.048	.325	.097
We often discuss issues related to entrepreneurship at school	1	5	.015	.048	-.602	.097
We often discuss issues related to entrepreneurship at home	1	5	.268	.048	-.786	.097
We often discuss issues related to entrepreneurship with friends	1	5	.416	.048	-.648	.097
I have set myself goals related to school and/or hobbies	1	5	-1.361	.048	2.194	.097
I know that I am able to complete difficult projects and/or tasks	1	5	-.870	.048	1.039	.097
I know where I am good at	1	5	-1.006	.048	1.446	.097
I have faith in myself	1	5	-.768	.048	.299	.097
I am persistent	1	5	-.825	.048	.880	.097
I am creative	1	5	-.626	.048	.110	.097
I want to do things better than others	1	5	-.430	.048	-.203	.097
I work well under pressure	1	5	-.386	.048	-.401	.097
I can affect my life	1	5	-1.143	.048	2.411	.097
I am the one in my circle of friends who has new ideas	1	5	-.218	.048	.366	.097
When I try out something new. I am not afraid to take risks	1	5	-.769	.048	.890	.097
I avoid situations where I do not know what to do reversed	1	5	.315	.048	-.192	.097
I keep my goals even when I face obstacles	1	5	-.623	.048	.984	.097
I think I could work as an entrepreneur	1	5	-.320	.048	-.457	.097
It would be great if I could become an entrepreneur	1	5	-.338	.048	-.355	.097
I understand how the economy works in an enterprise	1	5	-.288	.048	-.409	.097
I am able to plan a project	1	5	-.017	.048	-.191	.097
I am able to draw a business plan	1	5	-.514	.048	.045	.097
I want to establish a company in the future	1	5	.107	.048	-.420	.097

Table 8. Communalities for the questions number 10–35. (*N*=2558*)*

	Initial	**Extraction**
We often discuss issues related to entrepreneurship at school	1.000	.612
School has offered me adequate information on entrepreneurship	1.000	.611
We have a lot of co-operation with companies at our school	1.000	.597
I know that I am able to complete difficult projects and/or tasks	1.000	.586
Company co-operation is very useful to me	1.000	.537
We often discuss issues related to entrepreneurship with friends	1.000	.507
We often discuss issues related to entrepreneurship at home	1.000	.469
I have set myself goals related to school and/or hobbies	1.000	.440
I know where I am good at	1.000	.564
I have faith in myself	1.000	.587
I am persistent	1.000	.566
When I try out something new I am not afraid to take risks	1.000	.348
I am creative	1.000	.360
I am the one in my circle of friends who has new ideas	1.000	.318
I want to do things better than others	1.000	.371
I work well under pressure	1.000	.421
I can affect my life	1.000	.459
I avoid situations where I do not know what to do	1.000	.641
I keep my goals even when I face obstacles	1.000	.477
I am able to change my actions flexibly in changing situations	1.000	.361
I think I could work as an entrepreneur	1.000	.748
It would be great if I could become an entrepreneur	1.000	.761
I understand how the economy works in an enterprise	1.000	.697
I am able to plan a project	1.000	.759
I am able to draw a business plan	1.000	.648
I want to establish a company in the future	1.000	.693

6. Concluding remarks

Based on the examination of the data, the survey instrument seems to work well. Some of the challenges related to the validity and reliability of this type of research are assessed and reduced in advance. During the actual survey rounds, special attention needs to be paid to the marketing and instruction. In addition, the technical implementation is to be further improved. However, the data collection with the technical solution in use was successful. It was found that it is natural for students to use their own phone to answer. This, too, can be a factor that ultimately strengthens the quality of this research.

It seems that the development of this survey instrument in collaboration with various actors had a positive effect on the reliability and validity of this study. The process increased researchers' understanding of the target group. In addition, during the process, there was an opportunity to discuss the utilisation of research results with different actors. This increases the effectiveness of the study. According to Anastasi (1986), information gathered in the process of developing or using a test is relevant to its validity.

The research presented in this report is a nationwide study that offers enormous opportunities. There are only a few entrepreneurship education studies in which primary school pupils are the target group. This led to a desire to involve young people in the survey instrument-building process. Due to the help of teenagers, the survey instrument is now user-friendly. The first round of the study will be conducted in the autumn of 2020. Covid-19 may affect the execution of the survey, but this will only be known after the survey has been conducted. We would like to say a warm thank you to everyone involved in the construction of the survey instrument and to everyone who has shown a constructive interest in this research.

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