



Entrepreneurial readiness scale report

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Introduction

The academically unsuccessful students' problem of selflessness is a common issue to be solved at the European level. There are apprentices' practice during the vocational education (VET) and it has potential to support individual's entrepreneurial skills. Generally, these courses taken by apprentices on entrepreneurship are very weak and deficient to be competent. The traditional perspective that 'entrepreneurship is an innate feature and cannot be learned', today leaves its place to the view that 'entrepreneurship can be taught by training'. Entrepreneurship education can be considered as one of the most important factors in the formation of attitudes and behaviors of youngsters and of vocational education students in particular.

Apprentices are closer to entrepreneurship as their studies and in practice trainings. Nevertheless, entrepreneurship training and the encouragement of the apprentices are lacking in curriculums in many EU countries. Entrepreneurship is not only a vocational issue. It needs to consist of encouragement and empowerment apart from physiological supports like self-confidence and motivation. Meanwhile, the teachers in VET schools are not a component to provide this. Apprentices are not feeling themselves confident and independent. And there is not exist the effective support mechanisms. The trainings on the entrepreneurship should be prepared in a structured curriculum in which the apprentices' soft skills such as leadership, communication, negotiation, critical thinking, problem solving, conflict management etc. should be considered to be improved. Some attitudes and skills that support entrepreneurship can be acquired by young people already from their family if they are engaged in business there, but in addition, new knowledge, skills and attitudes can also be promoted during studies.

A relevant measurement tool is definitely helpful in supporting the entrepreneurial readiness of students and their entrepreneurial abilities. Measuring entrepreneurial readiness can provide insights into the strengths of individuals and highlight areas for improvement in the case of entrepreneurial studies or generally during the youth work. To create such an instrument, it is necessary to study which kind of factor structure is suitable for the scale and also study about the extent to which the questionnaire is suitable for measuring entrepreneurial scale. Based on the goal, the following research questions were posed:

- (1) Which factors are related to the development of the entrepreneurial readiness (ER)?
- (2) What factor structure best suits measuring entrepreneurial readiness in young people from vocational education?
- (3) Which factors are the most influenced by the previous entrepreneurial experiences?

Methodology

Research design

Accomplishing the aim of the research involved four stages: (1) finding the main factors to measure ER; (2) creating scale items according to the factors; (3) collecting data from youth aged 18–29, and (4) conducting data analysis according to the research questions. Data management and statistical analyses were performed using SPSS version 28.01.1.1. and SPSS AMOS version 29. Participation in the study was voluntary, sensitive data was not collected and the research used only anonymised data.

In the first phase of the research process, a scientific article about measurement of the ER was found from Google Scholar database. Thereafter the measurement tool was created based on previously used measurement tools, their factors and statements, which were adapted according to the specifics of vocational education. Ultimately, a 58-item questionnaire covering 6 factors was used to collect the data. A sample of young people aged 18–30 years was recruited through vocational educational institutions from Estonia, North-Macedonia and Turkey. A statistical description of the sample was prepared from the obtained results. The 6-factor instrument was analysed using Confirmatory Factor Analysis (CFA) based on the collected data. According to the CFA results, it was necessary to decide whether to continue with the existing model or find a model with better results. As the model results were not good enough, an Exploratory Factor Analysis (EFA) was conducted to find an alternative factor structure. The resulting 6-factor, 34-item questionnaire was in turn analysed using CFA.

Data collection instrument

In the first phase of developing an SAPE-SCALE instrument, the researchers analysed the content of ten scientific article where entrepreneurship scales were used, counting a total of 229 items across 32 factors (See Appendix 1). The main used instruments: Individual entrepreneurial orientation (IEO) (Sahoo & Panda, 2018) and entrepreneurial intentions (EIs) (Bolton & Lane, 2011; Sahoo & Panda, 2018), *Arts Entrepreneurship Profile (AEP)* (Hanson, 2021), Measures of Core Entrepreneurial Intention Model Elements (Daniel & Almeida, 2020; Liñán & Chen, 2009); Entrepreneurial attitude Orientation (EAO) scale (Robinson et al., 1991); Personal characteristics and entrepreneurial intention scale (Dinis et al., 2013). SDL for NEETs Kõiv & Saks (2024) SDL-NEET scale was added as it is scale focused to self-directed learning for young people at risk situation.

To find answer to the first research question - *Which factors are related to the development of the entrepreneurial readiness (ER)?*- all factors were categorized according to the content and following factor structure was completed: *personal entrepreneurial characteristics, risk management, responsibility acceptance, leadership, opportunity recognition in the profession, openness.*

The items under the factors were collected and items with the similar meanings were joint. The scale with 6 factors and 58 items were completed (See Appendix 1).

Data collection

The data were collected electronically using the Google Forms in January- February 2024. The SAPE-SCALE scale together with the participant background questions was distributed to a convenience sample by selected VET institutions and specialists. Considering the student status the sample for this study is young people aged 14–27.

Data analysis

An exploratory factor analysis with principal components method was conducted to find the factor structure for the SAPE-SCALE. In the current study, χ^2 statistic, CMIN/DF, Comparative fit index (CFI), Normed fit index (NFI), Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA) were used to assess goodness-of-fit of the factor structures. The t-test was used to test differences between the two independent groups of students with previous entrepreneurial experience (from entrepreneurial family, own entrepreneurship status or previous entrepreneurial courses) and without it.

Participants

The questionnaire was sent to 344 young people, of which 320 completed the questionnaires in full. The following table (see Table 1) presents the demographic background of the sample.

Table 1. Demographic data of the participants

<i>Variable</i>	Sample total (n=320) %, <i>SD</i>	Previous entrepreneurial experience (n=137), %, <i>SD</i>	No previous entrepreneurial experience (n=183), %, <i>SD</i>
<i>Gender</i>			
Male	218 (68.1%)	97 (70.8%)	121 (66.1%)
Female	96 (30.0%)	37 (27.0%)	59 (32.2%)
No answer	6 (1.9%)	3 (2.2%)	3 (1.7%)
<i>Age</i>			
Age	16.47 (SD=1.42)	16.87 (SD=1.17)	16.19 (SD=1.53)
<i>Country</i>			
Estonia	65 (20.3%)	51 (37.2%)	14 (7.7%)
North-Macedonia	81 (25.3%)	38 (25.8%)	43 (23.5%)
Turkey	174 (54.4%)	48 (35.0%)	126 (68.8%)

The sample was divided into two sub-groups – persons without any previous entrepreneurial experience or with experiences– with the sample size of 183 and 137 respectively. The demographic data for the youth without any entrepreneurial experiences was completed by respondents from Estonia (7.7%, n=14), North- Macedonia (23.5%, n=43) and Turkey (68.8%, n= 126), divided by gender so that 66.1% were male (n=121) and 32.2% female (n=59), and the average age was 16.19 years (SD=1.53).

Results

Factor structure of the measure of youth self-directed learning skills

In order to answer the first research question – *What factor structure best suits measuring entrepreneurial readiness in young people from vocational education?* - exploratory and confirmatory factor analyses were performed.

Exploratory Factor Analysis (EFA)

The EFA as a statistical technique was used to explore the underlying factor structure for the SAPE-SCALE instrument. Proceeding from the first model a four, five and six-factor analysis was chosen to test the structure. When testing the four-factor structure, factor loadings greater than or equal to 0.4 accounted for 47.73% of the cumulative variance that explained less than half of the strategy use being represented by the items in SAPE_SCALE. In the case of the five-factor structure, the groups that formed were mixed, having 2 to 13 items in one factor. In the case of the six-factor structure, factor loadings greater than or equal to 0.4 accounted for 50.33% of the cumulative variance, which explained over half of the strategy use being represented by the items in SAPE-SCALE. The structure of the model with 6-factor and 35 items was clearly the best compared with the other models and the further development and validation of the scale was based on this structure.

Confirmatory Factor Analysis

Continuing the validating process with a CFA four more items revealed a low factor loading (lower than 0.4). Removing these item left the two factor with only one item; therefore, these factors were removed and the final number of factors was decreased to 4. To verify the factor structure, the CFA was performed and the goodness of fit was analysed. The model goodness-of-fit is enough good ($\chi^2=582,197$, $df=368$, $CMIN/DF=1,582$, $CFI 0.953$, $NFI=0.882$, $TLI=0.948$, $RMSEA=0.043$). The model fit indices of the new 6-factor and 35-item SAPE-SCALE is acceptable for use in the research process.

So, the CFA resulted in a final SAPE-SCALE model with 4 factors and 29 items. According to the new loadings, the factors of the new model were renamed. The four factors (see Appendix 2) are: *personal attitude* (6 items), *responsibility* (5 items), *openness and innovation* (10 items) and *leadership* (8 items).

The internal consistency of the items within each factor was assessed using Cronbach's alpha. The results revealed that the alpha coefficients in all factors were above the acceptable level of .60 (.817–.914) (see Table 2).

Table 2. Cronbach's alpha coefficients and variance of the SAPE-SCALE factors

Factor	Variance	Cronbach's α	Number of items
Personal attitude	39.869%	0.914	6
Openness and innovation	8.167%	0.879	10
Responsibility	5.064%	0.817	5
Leadership	4.070%	0.870	8
Total	57.170%	0.940	29

The structure of the 4-factor model was clearly the best compared with the other models.

Comparison of the entrepreneurial readiness by young people with or without previous entrepreneurial experiences (parents and entrepreneurs, own entrepreneurship, participation in the entrepreneurial courses)

In order to answer the third research question – *Which factors are the most influenced by the previous entrepreneurial experiences?* - the means of the measured factors were compared between the two subgroups: young people with or without previous entrepreneurial experiences. Comparing these subgroups makes it possible to identify any significant differences between the groups and evaluate whether the scale adequately represents the content domain it is intended to measure for the relevant group.

The results indicated that young people without any previous entrepreneurial experiences generally have lower results in all SAPE-SCALE factors compared to those with previous experiences. Only one factor (*personal attitude*) revealed statistically significant differences between the two subgroups (See Table 3)

Table 3. Differences between two group (previous entrepreneurship experiences generally) factors.

	Without experiences		With experiences		t	df	p
	M	SD	M	SD			
Total	3.78	0.71	3.88	0.60	-1.425	312.46	0.078
Personal attitude	3.60	1.00	3.90	0.88	-2.723	309.53	0.003
Openness and innovation	3.83	0.79	3.89	0.68	-0.723	311.70	0.235
Responsibility	4.23	0.71	4.26	0.66	-.276	302.66	0.780
Leadership	3.56	0.79	3.64	0.78	-.899	295.73	0.185

Note: Statistically significant results given in bold.

Analyzing the conditions of entrepreneurial experience separately, the effect of family entrepreneurial experience on young people's entrepreneurial readiness is significantly different (See Table 4, Table 5, Table 6)

Table 4. Differences between two group factors in parents' entrepreneurial experiences.

	Without experiences		With experiences		t	df	p
	M	SD	M	SD			
Total	3.79	0.69	3.95	0.55	-2.075	133.25	0.020
Personal attitude	3.67	1.00	3.92	0.80	-2.143	131.68	0.017
Openness and innovation	3.83	0.76	3.95	0.66	-1.303	122.16	0.097
Responsibility	4.24	0.71	4.24	0.58	-.106	131.10	0.458
Leadership	3.55	0.81	3.80	0.68	-2.717	124.67	0.004

Note: Statistically significant results given in bold.

Table 5. Differences between two group factors in own entrepreneurship experiences.

	Without experiences		With experiences		t	df	p
	M	SD	M	SD			
Total	3.85	0.68	3.99	0.53	-1.951	52.97	0.028
Personal attitude	3.69	0.98	4.01	0.73	-2.356	54.55	0.011
Openness and innovation	3.84	0.75	3.93	0.66	-.705	49.34	0.436
Responsibility	4.24	0.70	4.29	0.60	-.467	49.70	0.321
Leadership	3.56	0.80	3.86	0.62	-2.615	53.25	0.006

Note: Statistically significant results given in bold.

Table 6. Differences between two group factors in participation in entrepreneurship courses.

	Without experiences		With experiences		t	df	p
	M	SD	M	SD			
Total	3.81	0.69	3.87	0.61	-.742	169.98	0.229
Personal attitude	3.66	0.97	3.93	0.91	-2.225	160.69	0.012
Openness and innovation	3.84	0.77	3.88	0.65	-.485	178.23	0.314
Responsibility	4.24	0.69	4.25	0.69	-.167	150.20	0.434
Leadership	3.61	0.78	3.57	0.82	-.373	144.53	0.355

Note: Statistically significant results given in bold.

These results indicate that the scale reliably measures the entrepreneurial readiness skills and makes it possible to distinguish the estimates of both groups. In summary, it can be concluded that the biggest difference between young people who have encountered entrepreneurship and young people who have not is in personal attitudes. The entrepreneurship experience of both parents and oneself has a positive effect on entrepreneurial readiness. The main effect is on personal attitudes and management skills. Training courses as preconditions have less effect to youth entrepreneurial readiness. This scale can be used to develop the factors highlighted in the development of training courses and thereby also influence entrepreneurial readiness among young people.

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APPENDIX 1

Table 1. Factors and items number from used scales

	Factor	Item number	Reference
1	Self-confidence	10	Gokhan et al. (2019)
2	Need for Success	6	
3	Personal Benefit	7	
4	Leadership and Responsibility	5	
5	Risk	3	Bolton & Lane (2012)
6	Innovative	4	
7	Proactive	3	Hanson (2021)
8	Opportunity Recognition	4	
9	Leadership	4	
10	Comfort with Uncertainty	4	
11	Networking	4	
12	Personal Attitude	5	Liñán & Chen (2009)
13	Subjective Norm	4	Dinis et al. (2013)
14	Perceived Behavioural Control	7	
15	Entrepreneurial Intention	7	
16	Entrepreneurial Intentions	6	
17	Locus of Control	7	
18	Propensity to Take Risk	6	
19	Self Confidence	6	
20	Need for Achievement	6	
21	Tolerance to Ambiguity	6	
22	Innovativeness	5	
23	Achievement	23	Robinson et al. (1991)
24	Self-esteem	14	
25	Personal control	12	
26	Innovation	26	Kõiv & Saks (2024)
27	Metacognition	6	
28	Resilience	4	
29	Attitude to learning	8	
30	Future orientation	3	
31	Responsibility	7	
32	Openness to new experiences	6	

APPENDIX 2

SAPE-SCALE THE FIRST MODEL

Personal entrepreneurial characteristics/attitude

I am ready to do anything to be a entrepreneur

Being as an entrepreneur implies more advantages than disadvantages to me

A career as entrepreneur is attractive for me

If I had the opportunity and resources, I'd like to start a firm

Being an entrepreneur would entail great satisfactions for me

Among various options, I would rather be an entrepreneur

*I feel inferior to most people I work with

Most of my time is spent working on several business ideas at the same time

* I never persist very long on a difficult job before giving up.

I have always worked hard in order to be among the best in my field

Risk management and responsibility acceptance

I like to take bold action by venturing into the unknown

I am willing to invest a lot of time and/or money on something that might yield a high return

I tend to act "boldly" in situations where risk is involved

* I feel best about my work when I know I have followed accepted procedures

I prefer to plan my own activities

I prefer to set my own goals

I am responsible for my own plans

I like to make decisions for myself

I am capable of learning for myself almost everything I might need to know

I never put important matters off until a more convenient time

I feel resentful when I get bossed around at work

I do every job as thoroughly as possible

Communication, networking, negotiation and competition

Social situations involving unfamiliar people make me uncomfortable

I am comfortable asking those I know to introduce me to strangers who

might be interested in my work

I always try to make friends with people who may be useful in my plans

* Even though I spend some time trying to influence business events around me every day, I have had very little success

I feel proud when I look at the results I have achieved in my business activities.

I believe that to succeed in business it is important to get along with the people you work with

* I seem to spend a lot of time looking for someone who can tell me how to solve all my business problems

I usually seek out colleagues/friends who are excited about exploring new ways of doing things

Leadership

I tend to be good at project management

I know how to set a clear direction for teamwork in order to reach a collective goal

Most often, I am the one among my peers who approves important decisions

I take an active part in community affairs so that I can influence events that affect my own plans/business.

I usually take control in unstructured situations

I always feel good when I make the organizations I belong to function better

I prefer to “step-up” and get things going on projects rather than sit and wait for someone else to do it

I am the kind of person who likes managing and influencing people

Opportunity Recognition in the Profession

While going about my daily routines, I see potential my profession ideas all around me

Frequently identify opportunities to start new professional activities (even though i may not pursue them).

I have a special alertness or sensitivity toward new venture opportunities in my profession

I use inspiration from my experiences to develop new ideas in my profession

I believe that in the business world the work of competent people will always be recognized

I believe the most important thing in selecting business associates is their competency

Openness/Innovation

I often like to try new and unusual activities that are not typical but not necessarily risky

In general, I prefer a strong emphasis in projects on unique, one-of-a-kind approaches rather than revisiting tried and true approaches used before

I prefer to try my own unique way when learning new things rather than doing it like everyone else does

I favour experimentation and original approaches to problem solving rather than using methods others generally use for solving their problems

I tend to plan ahead on projects

I enjoy a challenge

I like to try new things, even if I'm not sure how they will turn out

When presented with a problem I cannot resolve, I will ask for assistance

I am open to new ideas

I think of problems as challenges, not stopsigns

I'm happy with the way I investigate problems

I believe it is more important to think about future possibilities than past accomplishments

I enjoy finding good solutions for problems that nobody has looked at yet

I get excited when I am able to approach tasks in unusual ways

APPENDIX 3

SAPE-SCALE FINAL MODEL

PERSONAL ATTITUDE

1. I am ready to do anything to be an entrepreneur
2. Being as an entrepreneur implies more advantages than disadvantages to me
3. A career as entrepreneur is attractive for me
4. If I had the opportunity and resources, I'd like to start a firm
5. Being an entrepreneur would entail great satisfactions for me
6. Among various options, I would rather be an entrepreneur

RESPONSIBILITY

7. I prefer to plan my own activities
8. I prefer to set my own goals
9. I am responsible for my own plans
10. I like to make decisions for myself
11. I am capable of learning for myself almost everything I might need to know

OPPENNESS and INNOVATION

12. I tend to plan ahead on projects
13. I am open to new ideas
14. I'm happy with the way I investigate problems
15. I believe it is more important to think about future possibilities than past accomplishments
16. I enjoy finding good solutions for problems that nobody has looked at yet
17. I believe that in the business world the work of competent people will always be recognized
18. I believe the most important thing in selecting business associates is their competency
19. I believe that to succeed in business it is important to get along with the people you work with
20. I usually seek out colleagues/friends who are excited about exploring new ways of doing things
21. I do every job as thoroughly as possible

LEADERSHIP

22. I tend to be good at project management
23. I know how to set a clear direction for teamwork in order to reach a collective goal
24. Most often, I am the one among my peers who approves important decisions
25. I take an active part in community affairs so that I can influence events that affect my own plans/business.
26. I usually take control in unstructured situations
27. I prefer to "step-up" and get things going on projects rather than sit and wait for someone else to do it
28. I am the kind of person who likes managing and influencing people
29. I enjoy a challenge