












## ATTITUDES TO SUSTAINABLE ENTREPRENEURSHIP AND ENVIRONMENTAL VALUES OF STUDENTS: TESTING MEASUREMENT SCALE AND PRELIMINARY RESULTS OF CROSS-COUNTRY STUDY

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**Abstract.** Sustainable entrepreneurship (SE) is an approach that is crucial for creating enterprises that not only generate profit but also minimize environmental impact, promote social responsibility, drive innovations, and others. Furthermore, SE is one of the instruments to achieve Sustainable Development Goals (SDGs). The goal of this study is to investigate environmental values of students and evaluate their attitudes toward social entrepreneurship. 807 respondents from different countries (mostly from Latvia, Lithuania, Poland, and Slovenia) were surveyed using the authors' developed questionnaire. The main blocks were tested for internal consistency. Data processing was performed by means of frequency analysis, Mann-Whitney U test and correlation analysis. The results indicate the readiness of the most of respondents to reduce use of plastics. In general, the respondents are also agreeing with the statement “People should change their buying habits and way of life to solve our environmental problems.” However, only half of respondents are ready to change their own buying habits. The level of entrepreneurial intentions among students is quite low. Only 26% of the respondents were ready to start sustainable business within 5 years of graduation, even less (24%) had a sustainable business idea. The research also revealed the fact that women have a larger interest in starting a business comparing than male respondents.

**Keywords:** sustainable entrepreneurship, environment, sustainability, students, environmental values.

**JEL Classification:** L26, L31, Q01, O52.

### 1. Introduction

The terms “social entrepreneurship”, “environmental entrepreneurship”, “ecopreneurship”, “circular entrepreneurship”, and “green entrepreneurship” are on the academic agenda during the last decades (Campigotto-Sandri et al., 2020; Agusdin et al., 2023; Hussain, 2023). Sustainable entrepreneurship (SE) can be considered as an “umbrella concept”.

The authors of the paper in their understanding of it follow the statement of Baporikar (2020) about sustainable entrepreneurs, i.e., “...sustainable entrepreneurs share the economic desires of conventional entrepreneurs; but they have additional desires to preserve the environment: desires attributed to ecological values.”

The importance of sustainable entrepreneurship is confirmed, besides everything else, by the fact that in

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2021–2022, 10 University partners from Europe created an ENHANCE Alliance supported by the European Union's Horizon 2020 programme. The main aim of the Alliance was stated as "Mapping of Sustainable Entrepreneurship and Innovation Ecosystems".

The current paper continues the series of papers, based on the results of the survey conducted by the authors among students of higher education institutions in Europe (Titko et al., 2022; 2023). The survey was conducted, using the authors' developed questionnaire.

There are plenty of papers reflecting the results of surveys devoted to the perceptions of and attitudes towards sustainability and green practices, including those with focusing on environmental values and behaviour (Wray-Lake et al., 2010; Balundé et al., 2020; Miller et al., 2022; Niemczyk et al., 2023; Peng et al., 2021), sustainable development in general (Balakrishnan et al., 2020) and circular/green/sustainable entrepreneurship (Koe et al., 2019; Soomro et al., 2020a, 2020b). However, the amount of studies dealing with the investigation of relationship between environmental values and intentions to start a sustainable business is limited (Thelken & de Jong, 2020; del Brío González et al., 2022). The survey samples in the found papers were much smaller and consisted of single-country respondents. Besides, this topic is undervalued in the Baltic States or Eastern Europe.

Within the current research, the sample consists of 807 students, representing 38 countries. Most respondents were from Latvia, Lithuania, Poland, and Slovenia.

The current paper summarizes the respondents' reflections on the questions regarding their environmental attitudes and entrepreneurial intentions. We skipped the part related to the specific business models and their attractiveness to potential entrepreneurs to explore this point in the upcoming papers.

Measurement scales (B and C parts of the questionnaire) were tested for internal consistency, using Cronbach alpha. Data was processed by means of frequency analysis. To identify the difference in viewpoints of male and female respondents, Mann-Whitney U test was applied. Correlation analysis (using Spearman rho coefficient) was used for preliminary testing the relationship between respondents' environmental attitudes and entrepreneurial intentions.

In the current stage of the research, the main technical task was to receive and analyse data, based on the whole sample, in order to sketch the hypotheses to be tested further by means of more comprehensive methods (for instance, logistic regression and multilevel regression).

## 2. Literature review

Entrepreneurship is a phenomenon that is effective for solving economic, social and environmental issues (Cohen & Winn, 2007). Intentions are prerequisites of both traditional entrepreneurship activities (Westhead & Solesvik, 2016) and sustainable entrepreneurial actions

(Agu, 2021; Vuorio et al., 2018). Young people are more environmentally conscious than other generations (Hewlett et al., 2009).

Different theories have been used to explain entrepreneurial intentions, including intentions towards sustainable entrepreneurship. The theory of planned behavior (henceforth – *TPB*) (Ajzen, 1991) probably is the most popular one. However, studies on intentions are a very large field of research, and a significant number of studies explored different factors that might influence on three variables of the *TPB*, i.e., attitude, social norms, and perceived behavior control. One of the theories aimed at exploring factors that influence on behavior and its intentions is value theory (Schwartz, 1994). Schwartz (1992, p. 21) defined a value as "a desirable transsituational goal varying in importance, which serves as a guiding principle in the life of a person or other social entity". Values influence on beliefs, intentions and behaviours and are quite constant in time (Steg et al., 2015).

There are three types of values in environmental studies that are important for understanding sustainable entrepreneurship intentions, that is, egoistic, altruistic, and biospheric (De Groot & Steg, 2008).

Previous studies discovered negative and significant relationships between egoistic values and sustainable entrepreneurship behavior (De Groot & Steg, 2008). Similarly, the desire for materialistic benefits influences negatively the individual's attitude toward sustainable entrepreneurship.

Altruistic and biospheric values positively influence attitudes towards sustainable entrepreneurship behavior. Altruism is related to the individual's motivation to improve the wellbeing of other people (Penner et al., 2005). Altruism is one of the main motivations to start a sustainable enterprise (Patzelt & Shepherd, 2011; Thelken & Jong, 2020). Biospheric attitudes also positively and significantly influence the attitude towards sustainable entrepreneurship and actual behavior (Thelken & Jong, 2020). In its turn, Vuorio et al. (2018) found that attitudes toward sustainability are positively and significantly related to intentions towards sustainable entrepreneurship. Biospheric values are related to "a concern with the quality of nature and the environment for its own sake, without a clear link to the welfare of other human beings" (Steg, 2015, p. 165). Biospheric values are related to values such as respect for the earth, unity with nature, prevention of pollution, and protection of the environment (De Groot & Steg, 2008).

Although the role of biospheric values has been proved to be an important factor influencing sustainable entrepreneurship, there is still a lack of empirical studies to explore the link between biospherical values and factors influencing intentions to develop sustainable entrepreneurship. Furthermore, it has been argued that people consider only limited number of values when they make decisions towards the behavior, thus the studies exploring the link between values and sustainable entrepreneurship intentions and behaviour should focus only on

altruistic and biospheric values (De Groot & Steg, 2008).

In this research, we use the term “environmental” values instead of “biospheric”. Within the current paper, the authors will not investigate the relationships between respondents’ environmental values and their entrepreneurial intentions. This paper reflects the general results of the research. The summary of the results creates a basis for further testing of hypotheses about the above-mentioned relationship, as well as about the differences in responses depending on respondents’ socio-demographic characteristics.

### 3. Methodology

To achieve the goal of the research, the authors developed a questionnaire (Table 1), which consisted of three parts:

- Part A was dedicated to respondent profile as general questions about respondents
- Part B consisted of 12 statements related to environmental attitudes of the individual
- Part C included 6 statements related to social entrepreneurship
- Part D consisted of 9 statements about individuals’ willingness to start sustainable businesses.

Table 1. Structure of the survey (Source: developed by authors)

Part	Question	Type of the question; responses
A	Respondent profile	Age, gender, country of residence, field of education, salary
B	Environmental attitudes	12 statements. Evaluation scale: level of agreement (1 – absolutely disagree; 5 – absolutely agree)
C	Attitudes to sustainable entrepreneurship	6 statements. Evaluation scale: level of agreement (1 – absolutely disagree; 5 – absolutely agree)
D	Willingness to start a circular business	9 business types. Evaluation scale: level of readiness (1 – never, the lowest probability; 5 – the highest probability)

The process of the development of the questionnaire was described in detail in the authors’ previously published paper “Attitude Towards Sustainable Entrepreneurship among Students: Testing a Measurement Scale.” (Titko et al., 2022)

The statements of the B part of the questionnaire with labels are presented in Table 2.

The statements of the C part of the questionnaire with labels are presented in the Table 3.

The questionnaire was created using Google Forms and distributed among students, mainly from EKA University of Applied Sciences (Latvia), Vilnius Gediminas Technical University (Lithuania), University of Primorska (Slovenia) and Opole University (Poland) during the period of time from 05.2023 to 12.2023. Not only

Table 2. B part statements with labels (Source: developed by authors)

Statement	Label
I am ready to reduce the use of single-use plastics	Reduce the use of plastics
I am ready to reduce the amount of new products and goods I buy	Reduce purchasing
I am ready to reduce my air travel	Reduce air travel
I would rather choose brands that have environmentally sustainable practices/values	Sustainable brands
I am ready to stop purchasing certain brands or products if I have ethical or sustainability related concerns about them	Non-sustainable brands
I am ready to make an effort to cut down on the amount of electricity I use in order to save energy	Reduce the use of electricity
I am ready to reduce heat at my house in the winter in order to save electricity	Reduce heating
I am ready to use a bike or mass transit (if available) rather than a car to get to work	Change transport
People should change their buying habits and way of life to solve our environmental problems	Change buying habits
Government should take action to solve our environmental problems even if it means that some of the products we now use would have to be changed or banned	Government actions 1
Government should place higher taxes on products that cause pollution in their manufacture or disposal, so that companies will be encouraged to find better ways to produce them	Government actions 2
Government should take steps to deal with our environmental problems, even if it means most of us pay higher prices or taxes	Government actions 3

Table 3. C part statements with labels (Source: developed by authors)

Statement	Label
I have a preliminary sustainable business idea	Business idea
I intend to start a sustainable business in the future	Start a business
I am ready to start a sustainable business within five years after graduation	Start a business in 5 years
I want to start a sustainable business to solve environmental problems	Business to solve environmental problems
I want to start a sustainable business to solve social problems (gender equality, reducing unemployment)	Business to solve social problems
I want to start a sustainable business to get profit	Business for profit

full-time students, but also Erasmus+ mobility students participated in this study. In total, we collected responses from 807 respondents representing 38 countries. The largest share of the respondents were female respondents – 484, followed by male respondents – 238 persons. 7 respondents noted option “other”.

The most represented countries were Latvia, Lithuania, Poland, and Slovenia – 30%, 11%, 23% and 14% of respondents, respectively. 10% represented other EU countries, and 12% – other countries beyond the EU.

Regarding the educational background, the most of respondents represented the field “Economics and Finance” (40%), followed by “Management, marketing, and law” (30%). Other education fields are represented by respondents for less than 10%.

The largest share of the respondents decided not to answer the question related to their income. The largest share of the respondents who noted their level of income was below the minimal wage level – 20%. Between minimum and average salary level and above average salary level was represented by the same share of the respondents – 16%.

The internal consistency of measurement scales of part B and part C of the questionnaire was checked using Cronbach's alpha.

To respond to questions B and C, respondents were offered to use a five-point scale (1 – absolutely disagree; 5 – absolutely agree). Data was processed by means of frequency analysis. Ranking procedure was applied to increase the visibility of the results.

To test the difference in environmental values and perception of sustainable entrepreneurship between male and female respondents, Mann-Whitney U test was performed.

The relationship between environmental attitudes (“biospheric values”) and entrepreneurial intentions in the fields of sustainable business was tested, applying rank correlation analysis (using Spearman rho).

#### 4. Results of the research

The results of the internal consistency analysis are presented in Table 4 and Table 5.

The value of Cronbach's Alpha for the whole B and C scales was 0.885 and 0.863, respectively that points to the good level of consistency. The analysis of the measure “alpha if item deleted” pointed to adequate relevance of all statements.

Table 6 and Table 7 summarize the responses on the questions from B and C parts of the questionnaire. The authors analysed only the answers “4” (agree) and “5” (absolutely agree) in order to rank the statements in the scales.

According to the results of the data analysis, 68% of respondents are ready to reduce the use of single-use plastics. The next statements that the large groups of respondents agreed with were “Government should take action to solve our environmental problems even if it

**Table 4.** Internal consistency of B scale (Source: developed by authors)

Statement	Cronbach's Alpha if Item Deleted
Reduce the use of plastics	0.876
Reduce purchasing	0.876
Reduce air travel	0.888
Sustainable brands	0.873
Non-sustainable brands	0.874
Reduce the use of electricity	0.873
Reduce heating	0.879
Change transport	0.878
Change buying habits	0.874
Government actions 1	0.870
Government actions 2	0.875
Government actions 3	0.877

**Table 5.** Internal consistency of C scale (Source: developed by authors)

Label	Cronbach's Alpha if Item Deleted
Business idea	0.857
Start a business	0.831
Start a business in 5 years	0.835
Business to solve environmental problems	0.853
Business to solve social problems	0.869
Business for profit	.863

**Table 6.** Respondents who were “agree” or “absolutely agree” with the B scale statements (Source: developed by authors)

Statement	%
Reduce the use of plastics	68%
Reduce purchasing	50%
Reduce air travel	35%
Sustainable brands	53%
Non-sustainable brands	50%
Reduce the use of electricity	55%
Reduce heating	40%
Change transport	51%
Change buying habits	61%
Government actions 1	62%
Government actions 2	50%
Government actions 3	39%

means that some of the products we now use would have to be changed or banned” and “People should change their buying habits and way of life to solve our environmental problems” (62% and 61%, respectively).

From 50% to 55% of respondents are ready to reduce the amount of the new products and goods they buy, would rather choose brands that have environmentally

sustainable practices/ values, and are ready to stop purchasing certain brands or products if he/she has ethical or sustainability-related concerns about them, are ready to make an effort to cut down on the amount of electricity, are ready to use a bike or mass transit (if available) rather than a car to get to work and think that government should place higher taxes on products that cause pollution in their manufacture or disposal so that companies will be encouraged to find better ways to produce them.

Statements, which were rated with the lowest amount of respondents with agree or absolutely agree were about the readiness to reduce heating in the house to save electricity (40% of respondents), government should take steps to deal with our environmental problems, even if it means most of us pay higher prices or taxes (39% of respondents), and statement, what was rated by the lowest amount of respondents with two highest evaluations was about readiness to reduce air travel – only 35% of respondents rated it with agree or absolutely agree.

In general, our results are aligned with the results of the previous studies. For instance, 2023 survey revealed that “More than 60 percent of U.S. consumers are willing to adopt lifestyle changes” (Mazzoni, 2023). The survey conducted by Ernst&Young yielded statistics about consumers’ values. 84% say sustainability is important when making purchase decisions. (Rogers et al., 2021).

Results of Indian survey showed that “the majority of consumers stated that they were willing to pay more for products which are sustainably produced or environmentally friendly” (Statista, 2023).

Results of UK survey showed that “The majority of respondents practise energy-saving behaviours, and 40% believe they use some form of green provider or tariff for their energy supply” (Ashford & Strange, 2023). However, the results of the same research regarding transport choice contradicts with our results. From UK survey, “58% of drivers reported using alternative travel, a 5% increase since June 2022. Consumers are also adopting lifestyle changes when it comes to holiday travel, contributing to a reduction in their carbon footprint.”

Table 7. Respondents who were “agree” or “absolutely agree” with the C scale statements (Source: developed by authors)

Statement	%
Business idea	24%
Start a business	32%
Start a business in 5 years	26%
Business to solve environmental problems	22%
Business to solve social problems	29%
Business for profit	47%

The highest amount of respondents – 47% wanted to start a sustainable business to get profit, followed by 32% of respondents with the intention to start sustainable business in the future. 29% wanted to start a sustainable business to solve social problems (gender equality,

reducing unemployment), only 26% of the respondents were ready to start sustainable business within 5 years of graduation, even less (24%) had a sustainable business idea, and the smallest amount of the respondents (22%) expressed their willingness to start sustainable business to solve environmental problems.

These figures alone cannot serve as a basis for deep conclusions. The underlying reasons should be investigated to explain, for instance, why so relatively small number of respondents (only 35%) are ready to reduce air travelling. Besides, the factors affecting entrepreneurial decisions (specifically, barriers) should be defined.

We needed these basic statistics to proper formulate hypotheses to be tested during the next stages of the research. Mainly, we are interested in the investigation of the differences in perception of sustainable entrepreneurship between respondents’ groups with different social-demographic characteristics. We already tested several hypotheses about the effect of gender and age on environmental attitudes and attitudes towards sustainable entrepreneurship in our previous research (Titko et al., 2023), but we used a significantly smaller sample and did not perform a comprehensive analysis of moderating factors.

At the current stage, it is evident that there is a statistically significant difference in environmental values and perception of sustainable entrepreneurship between male and female respondents. Mann-Whitney analysis revealed the following statements (Table 8).

Table 8. The statements that were rated differently by males and females, based on Mann-Whitney U test results (Source: compiled by authors)

Statement	Mann—Whitney U test Sig.
Reduce the use of plastics	0.016
Reduce air travel	0.014
Non-sustainable brands	0.010
Reduce the use of electricity	0,003
Change buying habits	0.000
Government actions 1	0.004
Business idea	0.000
Start business	0.000
Start business in 5 years	0.000
Business to profit	0.001

Males are more likely to reduce the use of electricity that, probably, can be explained with a larger engagement of women in housework. This question will be investigated separately, but still, in Eastern European countries, the role of women in a family differs from the role of Western European women (Fodor & Balogh, 2010).

There is a difference between males and females regarding the statement “I am ready to stop purchasing certain brands or products if I have ethical or sustainability related concerns about them”. Males expressed the higher readiness. This is “Women are more health-conscious,

and consider sustainable food healthier than conventional food” (Šálková et al., 2023)

A surprising result have been received regarding the statements “I have a preliminary sustainable business idea”, “I intend to start a sustainable business in the future” and “I am ready to start a sustainable business within five years after graduation”. Women expressed more readiness to start a business comparing with male respondents. There are many contradictory viewpoints about entrepreneurial intentions and success of men and women. However, more and more recent studies confirm the prevailing role of women in a business world (Elting, 2021). Gender differences will also be point of a separate investigation within the large-scale research.

The next point is the relationship between environmental attitudes (“biospheric values”) and entrepreneurial intentions in the fiels of sustainable business. The results of the correlation analysis (only for correlation that is significant at the 0.01 level (\*\*)) are summarized in Table 9.

Table 9. Results of correlation analysis (Source: compiled by authors)

Pairs of statements	Spearman rho
Reduce the use of plastics – Business idea	0.121**
Reduce the use of plastics – Start business	0.091**
Reduce the use of plastics – Business to solve environmental problems	0.151**
Reduce the use of plastics – Business to solve social problems	0.113**
Reduce purchasing – Business idea	0.118**
Reduce purchasing – Business to solve environmental problems	0.160**
Reduce purchasing – Business to solve social problems	0.155**
Reduce air travel – Business idea	0.123**
Reduce air travel – Start business	0.094**
Reduce air travel – Start business in 5 years	0.097**
Reduce air travel – Business to solve environmental problems	0.151**
Reduce air travel – Business to solve social problems	0.146**
Sustainable brands – Business idea	0.181**
Sustainable brands – Start business	0.159**
Sustainable brands – Start business in 5 years	0.147**
Sustainable brands – Business to solve environmental problems	0.271**
Sustainable brands – Business to solve social problems	0.229**
Sustainable brands – Business for profit	0.093**
Non-sustainable brands – Business idea	0.143**
Non-sustainable brands – Start business	0.116**
Non-sustainable brands – Start business in 5 years	0.130**
Non-sustainable brands – Business to solve environmental problems	0.241**

End of Table 9

Pairs of statements	Spearman rho
Non-sustainable brands – Business to solve social problems	0.242**
Non-sustainable brands – Business for profit	0.074**
Reduce the use of electricity – Business idea	0.183**
Reduce the use of electricity – Start business	0.154**
Reduce the use of electricity – Start business in 5 years	0.158**
Reduce the use of electricity – Business to solve environmental problems	0.223**
Reduce the use of electricity – Business to solve social problems	0.196**
Reduce the use of electricity – Business for profit	0.096**
Reduce heating – Business idea	0.127**
Reduce heating – Start business	0.105**
Reduce heating – Start business in 5 years	0.092**
Reduce heating – Business to solve environmental problems	0.186**
Reduce heating – Business to solve social problems	0.171**
Change transport – Business idea	0.105**
Change transport – Start business in 5 years	0.103**
Change transport – Business to solve environmental problems	0.151**
Change transport – Business to solve social problems	0.163**
Change buying habits – Start business	0.103**
Change buying habits – Start business in 5 years	0.096**
Change buying habits – Business to solve environmental problems	0.182**
Change buying habits – Business to solve social problems	0.181**
Change buying habits – Business for profit	0.092**

Based on the correlation analysis conducted within the current research (using Spearman rho), we can preliminarily conclude that environmental attitudes positively influence the entrepreneurial intentions (all correlation coefficients for the pairs of statements from B part and the statements “Business to solve environmental problems” and “Business to solve social problems” were statistically significant at 0.01 level). These results are aligned with the results of previously conducted studies confirmed the positive relationship (Soomro et al., 2020a, 2020b; Koe et al., 2019; Thelken & Jong, 2020).

## 5. Conclusions

The current paper continues the series of papers which reflected the results of the same survey, but based on significantly smaller sample. Now, the number of respondents is adequate and allows making preliminary conclusions about the attitude of young people towards

sustainable entrepreneurship, at least in CEE countries (that were mostly represented).

Besides, based on the results of the test for internal consistency, it is evident that the developed questionnaire is appropriate for further application.

Frequency analysis revealed the moderate entrepreneurial intention among the respondents. For instance, only 32% are ready to start their own business. Specifying the timeline (5-years period), we received even smaller results – 24%. The interesting finding is the statistically significant difference between entrepreneurial intentions of women and men. Based on the results of Mann-Whitney U test, female respondents are more likely to start a business. This trend is referred to all business-oriented statements.

Correlation analysis revealed the statistically significant relationship between environmental attitudes (biospheric values) and entrepreneurial intentions among respondents.

Hypotheses about an effect of socio-demographic characteristics (namely, gender, age, country of residence and educational background) will be tested within the next stage of the research. Due to the fact that many respondents skipped the question about their income level, this variable will be excluded from the analysis.

## Disclosure statement

The authors do not have any competing financial, professional, or personal interests from other parties.

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