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## The Role of Education in Shaping Attitudes of Academic Youth Towards Sustainable Development

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**Abstract:**

**Purpose:** The purpose of the article is an attempt to answer the question about the current shaping of attitudes of European academic youth towards the idea of sustainable development.

**Design/Methodology/Approach:** The C&RT classification tree model was used, which allowed systematizing the factors differentiating attitudes towards the idea of sustainable development of 1175 students from over 30 European countries.

**Findings:** The work focuses on the role of education in understanding and perceiving the idea of sustainable development. It was not only a factor in the first division of the tree but also one of the more important predictors in the ranking generated by the C&RT model. The tree structure showed that school education and family's influence were the overriding criteria for differentiating students' attitudes towards the idea of sustainable development.

**Practical Implications:** In the conducted analysis of education, it appeared both as an indirect and direct factor - through meetings with sustainable everyday life and proper understanding of this concept. Also, some respondents indicated that in comparison to other actors and stakeholders addressed to recipients and implementers of the idea of development is precisely the idea of school.

**Originality/value:** The value of the research is extensive statistical material that enabled the use of an innovative research method - the classification model of C&RT trees.

**Keywords:** Sustainable development, students' attitudes, surveys, C&RT trees method.

**JEL classification:** Q56.

**Paper Type:** A research study.

**Conflict of interest:** The authors declare that there is no conflict of interests regarding the publication of this manuscript.

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## **1. Introduction**

The concept of sustainable development offers a qualitatively new form of a conscious and responsible life of an individual as well as in a society, based on development together with the surroundings - social and environmental, considering ecological restrictions and social expectations (Michnowski, 1995; Sinakou *et al.*, 2018). At the same time, it covers the management of natural, economic, and human resources, space management, institutional solutions, the moral sphere, and raising awareness leading to the choice of a specific life model (Piontek, 2002). The concept of SD requires the community to understand and shape the desired relationships between the environment, economy, and society (Dacko and Płonka, 2017).

To shape social behaviors that should be consistent with the postulate of intergenerational justice, as early as in 1992, during the United Nations Conference "Environment and Development" in Rio de Janeiro, the Agenda 21 Global Action Program agreed on the need to implement education for sustainable development (EZR) in the curricula of all fields, at all levels of the education system (Płonka and Dacko, 2019). Leaders from over 100 countries who participated in the conference unanimously emphasized that high-quality education is the key factor of change and a guarantee of sustainable development in practice.

The "Education Strategy for Sustainable Development" developed by the United Nations Economic Commission for Europe in 2005 (UNECE, 2005) emphasized the need to incorporate ESD principles into the education systems. This strategy emphasized that education is not only a basic human right but also a significant aspect of conditioning the implementation of sustainable development (Sinakou *et al.*, 2018). Education increases and strengthens the ability of individuals, groups, communities, organizations and, countries to make sustainable development choices.

The UN also emphasized the importance of education for the concept of sustainable development by establishing the period from 2005 to 2014 as a decade of education focused on sustainable development. During the UN summit in New York in 2015. It was decided to continue the existing educational activities, adopting the document entitled "Agenda for Sustainable Development - 2030" in which one of the key objectives of sustainable development was to provide the world community inclusive and high-quality education on sustainable development. Besides, it was agreed that adopted international agreements should be reflected in the policies and strategic documents of individual countries (Sustainable Development Agenda 2030, 2015). The provisions of the concept of sustainable development cannot be implemented solely based on agreements concluded between countries. The implementation of this concept is impossible without changing value systems, ways of thinking, changing habits, and the attitude of individuals to the environment. Education is therefore a key aspect in the process of social transformation for the implementation of the concept of sustainable development (Guskova *et al.*, 2016).

The goal of this approach is to encourage countries to develop sustainably through sustainable development education, into their formal national educational systems in the relevant subjects, informal learning, and education (Salimova, 2014). There are the following objectives of this strategy, which will contribute to the achievement of the aim (Guskova *et al.*, 2016):

- to ensure political, regulatory and operational frameworks of education for sustainable development;
- to promote the sustainable development based on formal and informal learning;
- to equip teachers with the competence to include sustainable development in their disciplines;
- to ensure that adequate tools and materials for education aimed at sustainable development are available;
- to promote scientific researches in the sphere of sustainable development.

The quality of higher education for sustainable development as a significant factor is defined by (Guskova *et al.*, 2016):

- satisfying the needs of economy and society in highly qualified specialists who possess the advanced knowledge, skills, abilities, professional and personal competence and are ready to apply them in practice;
- formation of the world information-oriented civilization;
- formation of social capital in the society which is considered to be decisive nonmaterial assets, defining the competitive advantage of the country, region, and organization;
- development of science, engineering, and technologies;
- the corporative culture, creation of new values and new ways of behavior;
- the access to ensure lifelong education;
- strengthening civil society institutions.

In the regulations adopted and implemented by the global community regarding the implementation of the concept of sustainable development, special attention is paid to education (Nolet, 2013). Institutions established for education should become centers of sustainable development shaping the ability of future generations to ensure harmonious interactions between man, nature, and economy (Mueller, 2013). Creating an education system should consider the requirements of the concept of sustainable development, by introducing elements of sustainable development into subjects of education at all levels of education - from kindergartens to universities and academies (Sivogarkov *et al.*, 2010). The study aimed to answer the question of how to shape the current European attitudes of students towards sustainable development? The authors, using the C&RT classification tree model, attempt to systematize the factors that differentiate these attitudes, paying attention to the role of education.

## **2. The Scope of Research**

The study presents the results of research devoted to the opinions and attitudes of European youth studying the idea of sustainable development. The data was obtained through a proprietary survey questionnaire addressing knowledge and interpretation of the concept of sustainable development, insights on the legitimacy and need of living following its principles, as well as actions taken by respondents in favor of this idea. These questions supplemented general information: age, gender, the country represented, residence and origin of the respondent (city/village), degree, semester, and the field of study.

The research was conducted in the period: April 2017–February 2019. The questionnaire was completed by 1,175 respondents, including 845 students from EU countries and 330 non-EU students. The study involved 21 different majors at all levels of education. Economic, biological, and natural, agricultural, humanistic, psychological, and social, philosophical, pedagogical, engineering, architectural, and geographical directions were represented in large numbers. With the help of lecturers from various academic centers, the survey form was widely distributed among students. Given the size and diversity of the research sample, the results were considered satisfactory and authorizing certain generalizations.

## **3. Methods of Research**

To identify the most important factors shaping the attitudes of European academic youth towards sustainable development, exploratory (research) data analysis was used. The classification tree method, classified as a Data Mining method, was used to discover patterns and relationships hidden in data (Dacko and Szajdecka, 2015). The classification tree method, propagated by the Breiman research team (Breiman et al., 1984), is based on the C&RT (Classification and Regression Trees) algorithm. Trees are looking for a set of logical 'if-then' division conditions, leading to a clear classification of objects (in this case, respondents' attitudes towards the idea of sustainable development). In the classification tree, a dependent variable is a qualitative feature, the variant of which is recognized based on the knowledge of continuous or categorical explanatory variables<sup>4</sup>.

## **4. Empirical Results**

The study omitted factors such as the respondent's country of origin, level of education, sex, origin, and residence (city/village). These factors have already been studied and described by the authors in another publication by using other methods (Plonka and Dacko, 2019). However, the subject has not been discussed fully.

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<sup>4</sup> <http://www.statsoft.pl/textbook/stathome.html>, 26/06/2020.

Therefore, the education factor was taken into account when attempting to identify other determinants. Respondents answered whether the issue of sustainable development was raised in class. The role of the frequency of respondents' meetings with the concept of sustainable development in everyday life in shaping their attitudes towards this idea was also examined. Besides, a proper understanding of the concept (verified through an open question about the definition of SD) and student views on the responsibility of various stakeholder groups for the application and implementation of sustainable development were taken into account. Respondents were also asked whether they think sustainable development is needed and whether their families function sustainably. The interactive tree model was to explain the reasons for the differentiation of 1175 students' answers to the question: Do you personally try to live under the principles of sustainable development? When constructing the tree, it was assumed that:

- the misclassification costs will be equal;
- the goodness of overfitting will be assessed according to the Gini measure;
- stopping rule will be pruned on misclassification error;
- terminal and split nodes should consist at least 20 observations;
- the quality control of obtained results will take place using V-fold cross-validation for  $V = 10$ .

A tree of moderate complexity emerged from the sequence of the trees. Interference with the tree was only reduced to its pruning, i.e. two split nodes were removed, which, according to the authors, did not lead to an extension of knowledge about the studied phenomenon, 10 split nodes and 11 terminal nodes were obtained. The tree did not provide for a situation in which the respondent would declare that he was not trying to live in harmony with sustainable development. This was the least frequently indicated answer (less than 12% of the total) and the number of other indications prevailed at each node (Table 1, Figure 1).

However, it can be pointed out under which answers "no" appeared most often: it was a group of 108 students who met with the idea of sustainable development at school but were not a subject to the educational department of the family and only expressed opinions, 1 – node 49). In this group, every fourth person chose a negative answer. The role of school education emerges in the hierarchy of factors determining the respondents' replies. Students who encountered the idea of sustainable development in class more often tried to live in harmony with sustainable development (Figure 1 - node 3). An important predictor of the studied attitudes was also the impact of the closest ones to the respondent - their family. According to this criterion, divisions were made detailing both those respondents who met and those who did not meet the idea of sustainable development at school. The family impact was stronger when the respondent met the idea of sustainable development at school

(high "yes" bar for node 40). It was also important for the respondent's internal conviction that sustainable development is essential (a split of node 5).

**Table 1.** Structure (%) of responses in the terminal nodes of the variable: Do you personally try to live under the principles of sustainable development?

Node number	Rank (variant) of the answer				Expected (most numerous) rank of the answers
	I have no opinion	Yes	Neither yes nor no	Not	
4	<b>79</b>	7	8	7	I have no opinion
6	13	<b>42</b>	34	11	Yes
7	19	16	<b>45</b>	20	Neither yes nor no
42	3	<b>86</b>	7	4	Yes
44	4	<b>79</b>	15	1	Yes
46	6	<b>79</b>	12	3	Yes
47	8	<b>54</b>	31	7	Yes
52	0	<b>94</b>	6	0	Yes
53	0	<b>60</b>	30	10	Yes
51	7	<b>45</b>	40	8	Yes
49	13	27	<b>35</b>	25	Neither yes or no

**Note:** the most common answer is in bold

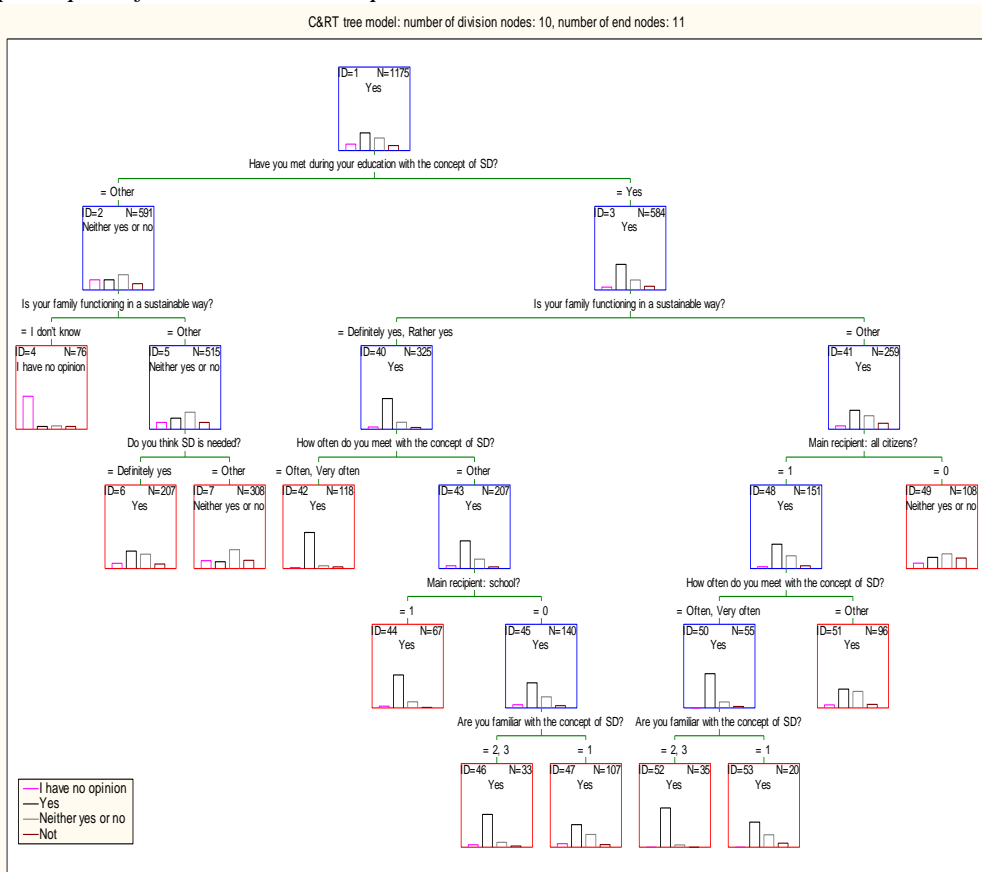
**Source:** Own study.

The frequency of meetings with the idea of sustainable development in student's everyday life also shaped their attitudes towards it - in the tree structure according to this criterion there were two splits: node 40 and 48 (the higher frequency of meetings was accompanied by a higher percentage of those who tried to live by the idea of sustainable development). Some respondents indicated school as the main implementer of the idea of sustainable development (Figure 1 - node 44). Such people also relatively more often tried to live in harmony with the idea of sustainable development.

In the deepest splits of the presented tree, there is a context of understanding the concept of "sustainable development". A proper understanding of sustainable development can be difficult even in a group of academic youth. As many as 78% of respondents to the open question about the essence of sustainable development did not answer, gave an incorrect or senseless answer (rank 1 in nodes 47 and 52). Those who fully read the sense of the idea of sustainable development (rank 3) or at least partially correctly interpreted it (rank 2), more often tried to live in harmony with sustainable development. The predictors have been systematized in terms of their impact on the dependent variable. The importance of predictors (i) is presented on a scale of 0 to 1 (Table 2). However, it does not fully correspond to the tree structure because it refers to the tree sequence. The summary, however, allows you to look from a broader perspective on the relationships between the factors that shape student's attitudes. Thus, living in harmony with sustainable development is

particularly determined by the respondent's family. This is confirmed by the fact that certain patterns are taken from home and that the immediate surroundings shape the behavior of a young person.

**Figure 1.** A tree for question: *Do you personally try to live in by following the principles of sustainable development?*



**Source:** *Own study.*

However, for them to be solidified and strong, the frequency of meetings with the idea of sustainable development in everyday life and the feeling that sustainable development is necessary is equally important. This is where the special role of universities appears, which should actively constitute this aspect. The role of the school cannot be underestimated in another context: it is important to properly understand the concept of sustainable development and how young people perceive the role of various actors in the process of implementing sustainable development. Although the education in the ranking itself fell slightly lower, this factor is indirectly manifested in the frequency of meetings and the proper understanding of the concept of sustainable development.

**Table 2.** *Importance of predictors for a dependent variable: Do you personally try to live by the principles of sustainable development?*

<i>Type of the predictor</i>	<i>Importance</i>
<i>Do you think your family is functioning sustainably?</i>	
<i>How often do you meet with the concept of sustainable development?</i>	$i > 0,70$ (very important)
<i>Do you think sustainable development is needed?</i>	
<i>Are you familiar with the concept of sustainable development?</i>	
<i>Main recipient: all citizens?</i>	$0,70 \geq i > 0,40$ (important)
<i>Main recipient: school</i>	
<i>Have you met during your education with the concept of sustainable development?</i>	
<i>Main recipient: farmers</i>	$0,40 \geq i > 0,20$ (medium important)
<i>Main recipient: large companies and corporations</i>	
<i>Main recipient: Church</i>	
<i>Main recipient: the European Union</i>	
<i>Main recipient: country governments</i>	
<i>Main recipient: ecological organizations</i>	$i \leq 0,20$ (low important)
<i>Main recipient: the United Nations</i>	
<i>Main recipient: local governments</i>	
<i>Main recipient: entrepreneurs</i>	

**Source:** *Own study.*

## 6. Discussion

Both practical and theoretical studies emphasize the problem of a proper understanding of the concept of sustainable development (Dacko, 2011). The definition of sustainable development can be difficult for most of the society to understand, and the guidelines for introducing education for sustainable development in schools, particularly including the universities, are rather general and apply only to certain fields of study (Expertise ..., 2012). Research conducted by the Guskova team shows that over 43% of students and as much as 25% of teachers from regions of the Russian Federation have not heard or heard little about the concept of sustainable development (Guskova *et al.*, 2016).

The current higher education system is characterized by an approach focused on narrow specializations and isolation of scientific fields (Lorek, 2013). The curricula show a tendency to treat economic, social, and environmental aspects of sustainable development separately (Lorek, 2013). The lack of a precise, unambiguous definition directed students to the economic and social aspects of sustainable development, ultimately diverting their attention from issues of status and protection (Kopnina, 2014). The research conducted by Płonka and Dacko (2019) shows, in turn, that the understanding of the idea of sustainable development by young people was dominated by the context of environmental protection and saving its resources. Cases of a comprehensive education program subordinated to the principles of



sustainable development are still rare.

The mere introduction of the concept of sustainable development into curricula is insufficient. To ensure a comprehensive understanding of this concept, innovative teaching methods should be used: teaching approaches, such as self-regulated learning, active learning, experiential learning theory based on Kolb's learning circle, constructive learning, problem-based, and project-based learning promote a holistic understanding of SD. (Du *et al.*, 2013). This holds for inter-disciplinary teaching approaches as well (Lozano, 2010).

## 6. Summary and Concluding Comments

The concept of sustainable development still looks better in theory than in practice. There is many awareness, political and economic barriers that hinder actual efforts to implement this idea. There is a need to improve curricula - so that they lead to a more effective intellectual development of young people, leading to a better understanding of the concept of sustainable development, raising awareness and the sense of responsibility for the living environment, and further civilizational development.

It is worth emphasizing that more than half of the respondents when asked whether they met with the idea of sustainable development during their education did not answer affirmatively. As many as 78% of respondents to the open question about the essence of sustainable development did not answer or gave an incorrect/meaningless answer.

Extensive statistical material enabled the use of an innovative research method - the C&RT tree classification model. It is worth noting that education was a factor in the first division of this tree. It was also one of the most important predictors in the ranking generated by the C&RT model. The structure of the tree showed that education and family interaction were the overriding criteria for differentiating student attitudes towards the idea of sustainable development.

It should also be emphasized that in the conducted research education appeared as a direct factor, but it was also manifested indirectly - through the frequency of meetings of academic youth with sustainable development in everyday life and proper understanding of this concept.

One cannot neglect the fact that some respondents directly indicated that, against the background of other actors and stakeholders, the school is an important addressee and implementer of this idea. Sustainable development should be taught at virtually every level of education. However, undoubtedly, higher education plays a special role in shaping the values that determine the youth's attitudes.

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