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Sustainable Development in the Consciousness of Students

The development of the civilization and consumerism found in the lifestyles of the society do not always take into account the behaviours which manifest the visualization of the population of the existence in accordance with the rights and respect for the nature. The reasons for such situation can result from the variety of the educational neglect as well as the created by the media materialistic lifestyles. However, the level of the awareness can be significantly improved by the competent preparation of future teachers so as to implement environmental issues and the concept of 'sustainable development' in the educational process. To find out about the level of the respondents' knowledge and to get the comprehensive information dealing with such issues, the research studies involving 568 students of Biology, Geography, Chemistry, Physics and Mathematics were carried out.

Sustainable development – terminological establishments

The problems of the environment protection tend to be the response to the growth of the industry, technology development and lifestyle changes in the society, which are not always in accordance with the laws of nature. Every problem allows for the creation of the strategy of actions that aim at stopping the degradation and at the prevention of the negative effects. Such issues are involved in the sustainable development programme.

Quoting the statements from the Earth Summit conference:

> The idea of sustainable development was created in opposition to the traditional development, i.e. programme-based economic growth. The critique of the existing model of the human development, overexploitation of natural resources, environmental degradation, as well as the discussion related to the problem of the growing gap between the rich and the poor (Pawłowski 2005).

Poland as the participant of the Earth Summit Conference in Johannesburg in 2002 implements the principle of 'sustainable development' and introduces it to

the internal politics of the country. It is confirmed by the regulations found in the Constitution of the Republic of Poland, namely:

Article 5: The Republic of Poland shall safeguard the independence and integrity of its territory and ensure the freedoms and rights of persons and citizens, the security of the citizens, safeguard the national heritage and ensure the protection of the natural environment pursuant to the principles of sustainable development[1].

Article 74: 1. Public authorities shall pursue policies ensuring the ecological security of current and future generations[2].

The realization of the concept of 'sustainable development' is not possible by the use of the legal, or economic mechanisms as well as other business – organizational undertakings if they are not accompanied by the understanding and support of the whole society. The most important are primarily the changes in the awareness and attitudes towards the natural and social environments (Sarzała 2005).

Coming back to the very beginning, we come across the report dealing with the issues of 'sustainable development'.

In 1987 the report of the UN World Commission on Environment and Development under the chairmanship of Gro Harlem Brundtland was released. The report was called "Our Common Future" and it defined the quoted earlier, i.e. at the beginning of report, the concept of 'sustainable development' (*le développement durable*). It was emphasized that the creation of the fully sustainable way of life required various actions in different regions of the world. First of all, it was necessary to integrate the activities in three key areas:

1. the economic growth and even distribution of benefits;
2. the protection of natural resources and the environment;
3. the social development[3].
4. Searching for the meaning of the term/concept of 'sustainable development', the following interpretations were found:

> 'Sustainable development' means that the economic growth leads to the increased social cohesion (including the reduction of the social stratification, equalling opportunities, preventing from marginalization and discrimination) and improving the quality of the environment by, inter alia, reducing the harmful effects of the production and consumption on the environment, the protection of natural resources[4].

The civilization and the environment should not compete with each other, however, there is a question of if it is not possible in today's world:

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[1] *RP Constitution of 2 April 1997*, J.L. No. 78, item 483, p. 3.

[2] Ibidem, p. 7.

[3] http://www.ekoedu.uw.edu.pl [Access: 21.11.2007].

[4] http://www.ekoedu.uw.edu.pl [Access: 21.11.2007].

> [...] at the current level of the civilization, 'sustainable development' is possible, that means such development that meets the needs of the present without compromising the ability of the future generations to meet their own needs[5].

The concept is defined in different ways, however, we can find in each and every of the definitions, the significant sentence, i.e., the essence of the concern for the natural resources that are around us:

> 'Sustainable development' of Earth is the development that meets the basic needs of all human beings and which conserve, protect and restore the health and integrity of the Earth's ecosystem, without compromising the ability of future generations to meet their own needs and without going over the limits of long term capacity of the Earth`s ecosystem[6].

Can the attitude of the society towards the goods of the nature become the determinant of the everyday existence of the society? Lubomir Domka considered such issues:

> At the dawn of the new millennium, the world had to face the need for the global challenges of our civilization degrading nature. Many symptoms indicate that the destruction of natural ecological systems tends to be the greatest danger to the future of the human species and the future of the planet. It can be observed that the anthropopressure with regards to the environment has become the modern indicator of the system of social values that requires the radical questioning and the rejection. It is necessary to quickly and firmly give up many extravagant aspirations and the ignorance towards the nature, its overuse, absolutizing the power of technology and material well-being [...] (Domka 1998).

What is the wealth of wildlife with regards to the chase of today's everyday life? Or can the wealth of wildlife, according to the laws of nature, be identified with the material one?

> Wealth [...] – it is the management of some excess over what is needed only for the maintenance of life [...]. The real wealth is in fact the management of the excess – the net product. The one and only nature or the ground can be such source, because only in the production of the ground the forces of nature are revealed [...] (Bartkowski 1979).

The need to protect the natural wealth was already commented in distant times by one of the members of the Club of Rome, whose interpretation of the words is dealt with by Z. Gazdowicz:

> Aurelio Peccei, the earlier president of the Club of Rome also wrote about the necessity of the revolutionary change in thinking about the world and the human nature. He emphasized that the great successes of the industrial era led to the degeneration of the developmental processes [...]. Such development, according to this precursor of the global thinking, refers to and takes into account only the question of the quantity

[5] http://www.ine-isd.org.pl [Access: 6.01.2008].

[6] http://pl.wikipedia.org/wiki/Zrównoważony_rozwój [Access: 17.01.2008].

> and materiality, neglecting the quality, and at the same time overexploits raw material resources and destroys the natural environment, which must be considered as the so-called 'blind' development, leading to the inevitable collapse of the civilization (Gazdowicz 1995).

Everyone has the perspective of the future, therefore it is worth identifying it with the issues of the protection of the environment.

For the future it is essential to build a new intellectual and moral formation of the society, which is responsible for the fate of their own and other generations, non-human beings, recognizing the affirmation of life, the integrity of forms of nature (Domka 1998).

The concept of 'sustainable development' has grown on the basis of the considerations related to the wildly understood ecology. There has been a lot of confusion considering the ideas of sustainable development and sustainability. The most common mistake to be acknowledged is the incorrect identification of the so-called sustainable development and eco-development. The latter term/ concept refers only to the environmental dimension included in the programme of 'sustainable development' and sustainable development values and objectives (Warych 2005).

The concept can be referred to the social dimension and to make an attempt to interpret it from a different perspective than the existing ones.

Sustainable development means that the economic growth leads to the increased social cohesion (including the reduction of the social stratification, equal opportunities, preventing from marginalization and discrimination) and to the improvement of the environment quality by, among others, the reduction of the harmful impact of the production and the consumption on the environment, the protection of natural resources (Kozłowski 2000).

Discussing the issues referring to the key concern discussed in the chapter of the monograph, the words of Danuta Cichy should be quoted:

> Sustainable development – it is the concept expressing a new philosophy of the world order. It sets the new order of activities developed by the countries at the end of the last century, the ideal vision, the image of the world which we should lead consistently and severally (Cich 2005).

The awareness considering the value of environmental goods existed already in the primitive civilizations, although it was not suggested by individual programmes.

The process of the aspiration for sustainable development began at the early stage of the civilization development of human-beings who lived and worked in accordance with the rhythm of nature, without burdening the natural environment by their activity. The total number of the local threats was so small that nature could deal with them itself successfully (Tuszyńska, Łyczkowski 2005).

Currently, such aspects and action programmes are looked for so as to develop the awareness of the nation, together with the initiation of the theoretical aspects of everyday life.

Therefore, sustainable development does not refer to the environmental protection in the traditional sense, known as the so-called type of 'the end of the pipe' (even though many still understand it in this way). It is definitely and in particular the 'development', but conditioned by the ecological space, and by the assumed synergies of the economic, environmental and social, aspects, moreover, it is safe and beneficial for human-beings, the environment and the economy. Therefore, it is not considered to be the 'brake' which stops the progress, but it is its 'stimulus'. It is also a way of life and a form of the ethics, giving the opportunity to select the forms of the consumption and the production. It is also the 'fashion', since the consumers associate the organic product with something safe and healthy, as well as with something that is up to date[7].

The legal record demonstrates the concept in the following way:

> Whenever the Act refers to [...] sustainable development – it is understood as the socio and economic development, in which the process of integrating political, economic and social actions takes place, with maintaining the balance of nature and the stability of the basic natural processes, in order to guarantee the ability to meet the basic needs of the communities or citizens of the present generation and future generations[8].

Interpreting the subject principle, the strategy of actions in order to achieve the decent life can be learned. Sustainable development also known as eco-development:

> [...] it is found in the place where people assume to face the limitations associated with the finiteness of the planet and independent from the human rhythm of nature [...]. It is the strategy of getting the decent life in the range of what is physically and biologically possible. It guarantees the basic needs of present and future generations maintaining at the same time the sustainability of functioning of the natural environment as well as the natural diversity of both species and ecosystems[9].

Can the manifestation of the concern for the wealth of nature at present save the consumption potential for the new generations? We can answer this question by reading the following definition: "Sustainable development connects economic progress with respect for nature and the social development, creating better prospects for the future generations"[10].

The following terms should be also paid attention to.

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[7] http://www.mos.gov.pl [Access: 6.01.2008].

[8] Art. 3 item 50 of the Act of 27 April 2001 on the Environment Protection, J.L. 2001 No. 62, item 627.

[9] http://www.ine-isd.org.pl [Access: 8.01.2008].

[10] http://www.wwf.pl [Access: 8.01.2008].

Sustainable development is:

- the development that does not endanger the natural environment, allowing the future generations to use the Earth's resources as much as we use them successfully today,
- the principle of "don't do unto others what you don't want others to do unto you" (or, also known as "what goes around, comes around") the term 'the others', then, refers to our descendants,
- providing the next generations with the sufficient amount of supplies – sufficient resources (including the capital ones) necessary to maintain the consumption per capita at the highest possible level (economy version of the biblical principles)[11].

'Sustainable development' can be also defined considering the economical point of view, guided by using and linking the distant currents:

Sustainable development – it is the philosophy of the socio-economic development harmonized with respect to the environment. It enables for the re-conciliation of the efforts of the satisfactory economic result and the deep concern about the social and natural environments.

The pillars of Sustainable Development:

• economic efficiency – the profit for the community taking into account the social and environmental costs,

• concern for the environment – the protection of the natural non-renewable resources, minimizing the negative impact on the environment,

• social sustainability – creating new jobs and working actively to improve the quality of life[12].

Among 27 principles of the Rio Declaration on Environment and Development, the special attention should be paid to the following aspects:

Principle 1: Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

Principle 21: The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all**.**

Principle 25: Peace, development and environmental protection are interdependent and indivisible[13].

Current threats to the environment are caused by the common way of the existence, and at the same time the improvements and enhancements associated with it. Such way of life can appear as the challenging exam, which nature cannot pass. The awareness of this problem was discussed by me and Barbara Parka:

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[11] http://www.energia.eco.pl [Access: 8.01.2008].

[12] http://www.kogeneracja.com.pl [Access:: 8.01.2008].

[13] Rio Declaration http://www.ko.poznan.pl/pub/ftp/Edukacja_zrownowa-zonego_rozwoju/DEKLARACJA_Z_RIO_1992.pdf [Access: 8.01.2008].

> We live in the era, in which the rapid development of sciences and technology in various fields of life has been taking place. This rapid development, often uncontrolled, and in many cases being subject to the laws of the ruthless exploitation and consumption, has become, undoubtedly, the force that threatens the existence of the mankind. The important problem thought will be the subordination of social needs and aspirations to the environmental possibilities (Parka, Żeber-Dzikowska 2005).

Searching for the causes of the environmental degradation by human-beings, the contents that are considered to be a form of the justification for such actions can be found in the foreign literature.

> In many regions the poor population with the high biodiversity – mainly agricultural one – [...] often has no other choice but to exploit the surrounding environment to meet the needs of the human existence. Under such conditions, the rapid population growth can lead to the collision of traditional customs, which were ecologically bearable [...], but they are becoming increasingly difficult to bear for species and ecosystems, i.e. when there are more and more residents and they are also consuming more and more[14].

Analyzing these words, one can consider the amount of entities, apart from the human activities, which are the cause of the deteriorating state of the environment:

> The arguments of environmentalists against the excessive consumption indicating the increase in the population and growing level of the private consumption, the use of disposable materials led to the total depletion and degradation of ecosystems [...]. However, the religions extend the argumentation [...] that simple lifestyle saves the good [...], which allows human-beings to cultivate the relations with the world[15].

To preserve the wealth of nature and to cease the unconscious destruction, the knowledge of the factors and the creation of security systems that would allow to control the negative changes are needed. This is also expressed by E. Fleszar:

> One of the factors that most seriously threatens the biodiversity is the destruction and the pollution of the natural environment. In order to prevent nature from it, the policy of the sustainable eco-development is realised This strategy involves the prevention from the pollution and contamination at the source (Fleszar 2005).

Methodology of the personal research

Preceding the analysis of the research results, the main problem was formulated, furthermore, the specific problems were formulated and the main hypothesis together with the specific hypotheses were created.

Main Problem: Whether and to what extent are the students of Natural Sciences prepared to implement the issues of sustainable development? In order

[14] http://www.hewdream.org, translation [Access: 23.04.2008].

[15] http://www.hewdream.org, translation [Access: 25.04.2008].

to interpret the above mentioned problem more precisely the following specific problems were created:

1. From what sources do the students get the information dealing with the concept of 'sustainable development'?
2. What impact have various forms and time taken to acquire information on the level of gained knowledge in the field of 'sustainable development'?
3. Are the students of Natural Sciences able to interpret the definition of 'sustainable development' correctly?
4. Do the students know the assumptions of 'sustainable development' and take actions in favour of the local community?

Main Hypothesis: The students of Natural Sciences are well prepared to implement the issues of 'sustainable development'.

Specific Hypotheses:

1. The information dealing with 'sustainable development' is acquired by the students from many sources and at different stages of education.
2. The acquired knowledge at the specific stage of education and its forms differentiate the level of the students' knowledge in the field of 'sustainable development'.
3. The students of Natural Sciences can interpret the definition of 'sustainable development'.
4. The students are familiar with the assumptions of 'sustainable development' and requirements relevant to the implementation of the activities for the local community.

To assess the level of the knowledge of the specific topics by the students studying different fields of Natural Sciences, the diagnostic survey method was employed. In the present studies the survey was considered to be the research technique, and the questionnaire consisting of 20 questions was found to be the research instrument. The respondents were informed about the purpose of the research. The questions were of the open and closed types, with the diverse contents allowing for reliable and varied responses. Not all questionnaires were, however, comprehensively and conscientiously filled in, since mainly open-ended questions were skipped by the respondents, most likely due to the lack of knowledge dealing with the topic. Although they did it willingly, it was nevertheless not done well enough, which can cause some objections.

Tab. 1. Quantitative analysis of the respondents according to their sexes

Differentiation according to sex	Fields of studies									
	Biology		Geography		Chemistry		Maths		Physics	
	N	%	N	%	N	%	N	%	N	%
Women	144	66.4	57	49.1	54	47.4	32	33.0	8	33.3
Men	73	33.6	59	50.9	60	52.6	65	67.0	16	66.7

The research studies ware carried out in the time period of 2007–2010. They were conducted among 568 students of Natural Sciences. The studies involved 217 students of Biology, 116 of Geography, 114 of Chemistry, 97 of Mathematics (Maths), and 24 of Physics. The table below shows the quantitative statement.

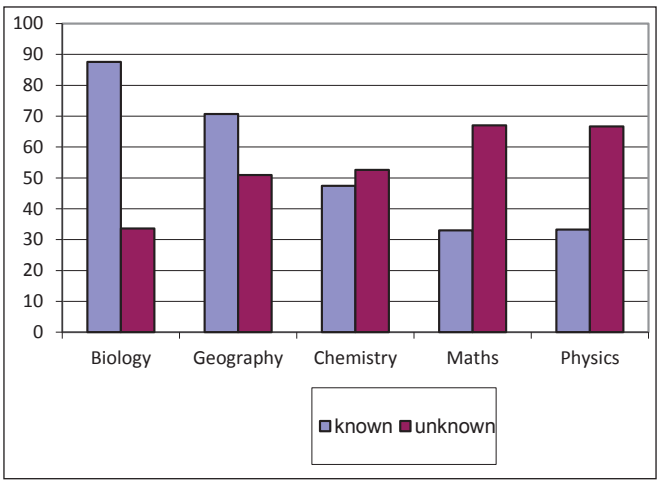
Analysis of the results of the empirical research

In order to determine the resources of information and the level of the students' preparation to implement the issues of 'sustainable development' and to obtain reliable information, all of the respondents were asked to complete the questionnaire consisting of 20 questions.

The first question required the recognition of the knowledge of the term/ concept of 'sustainable development'.

Tab. 2. The knowledge of the term/concept of "sustainable development''

The knowledge of the concept of 'sustainable development'	Fields of studies									
	Biology		Geography		Chemistry		Maths		Physics	
	N	%	N	%	N	%	N	%	N	%
known	190	87.6	82	70.7	54	47.4	32	33.0	8	33.3
unknown	27	12.4	34	29.3	60	52.6	65	67.0	16	66.7



Graph 1. The knowledge of the term/concept of "sustainable development''

The first question concerned the knowledge of the concept of 'sustainable development'. Although the research studies were conducted among the students of different fields of Natural Sciences, not all of them confirmed the knowledge of the above concept. Based on the analysis of the obtained results it can be concluded that not all of the students from the five selected fields of Natural Sciences were familiar with the term/concept of 'sustainable development'. The Biology students (190

students – 87.6%) and the Geography students (82 students – 70.7%) demonstrated the greatest knowledge. Much more insignificant knowledge of this term/concept can be seen among future chemists (54 students – 47.4%), not to mention the least positive responses ticked by the students of Physics (8 students – 33.3%) and Mathematics (32 students – 33%).

The second question required to demonstrate their own interpretation of the term/concept of 'sustainable development', and among 568 of the respondents only 114 responded to it, representing 20.1% of the total number.

In the next question, the respondents were asked to show the circumstances in which they learned about the term/concept of 'sustainable development' for the first time.

Tab. 3. Educational stages, during which the respondents heard the term/concept of 'sustainable development' for the first time

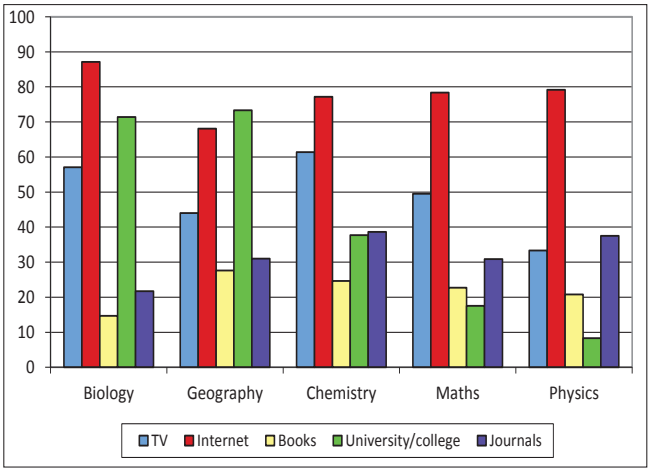
Educational stages	Fields of studies									
	Biology		Geography		Chemistry		Maths		Physics	
	N	%	N	%	N	%	N	%	N	%
Primary school	16	8.4	13	15.9	10	18.5	6	18.8	2	25.0
Secondary school	45	23.7	29	35.4	13	24.1	13	40.6	4	50.0
University/college	87	45.8	32	39.0	15	27.8	8	25.0	2	25.0

The knowledge about 'sustainable development' can be gained at different stages of the education. The presented data seem to show that the knowledge in this area was acquired at universities/colleges, and it was indicated by most people. Such answer was marked by 144 people, representing 39.3% of the students familiar with the term/concept. A large group (104 people – 28.4%) answered that the concept was discussed in secondary school. Primary schools as the source of information was acknowledged by 47 people – 12.8%. Definitely the smallest number of Biology students – only 8% – learned about the concept in primary schools, and the greatest number at universities/collages – 45%.

Tab. 4. Sources of information associated with the environment protection

Information sources	Fields of studies									
	Biology		Geography		Chemistry		Maths		Physics	
	N	%	N	%	N	%	N	%	N	%
TV	124	57.1	51	44.0	70	61.4	48	49.5	8	33.3
Internet	189	87.1	79	68.1	88	77.2	76	78.4	19	79.2
Books	32	14.7	32	27.6	28	24.6	22	22.7	5	20.8
University/ college	155	71.4	85	73.3	43	37.7	17	17.5	2	8.3
Journals	47	21.7	36	31.0	44	38.6	30	30.9	9	37.5

In the next question, the respondents were asked to indicate the sources of information dealing with the environment protection.



* Percentages do not create total –100%, since we deal with multiple choice questions

Graph 2. Sources of information associated with the environment protection

The idea of 'sustainable development' is inextricably linked with the rules and environmental projects associated with nature protection. It is impossible to acquire the knowledge of nature without the knowledge and interest in the field of the laws of nature. The surveyed students indicated the answers from the following options, such as: literature, the Internet, universities/colleges, books, TV, journals, so as to show the ones that they mainly benefit from. The respondents gained the knowledge, first of all, from the Internet. It was indicated by 465 people (44.8% of the total responses). The Internet was the most popular with those studying Biology – 189 people (87.1% of the surveyed students). Also the university/college appeared to be the significant source of knowledge for the students, specified by 155 people (71.4%). Analyzing the respondents studying Biology and their other choices, TV was marked by 124 people, which constituted 57.1%. The fewest students of Biology used the literature. Among the geographers, 85 people (49.7%) as the source of information indicated university/college, 52 (30.4%) of the respondents acquired the knowledge from the Internet, while only 32 people (18.7%) looked for information in books.

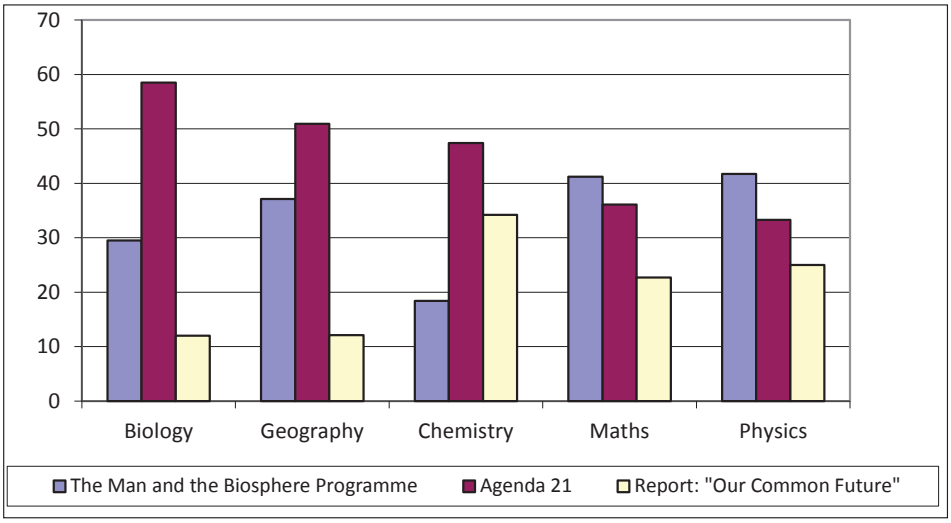
The Internet proved to be the most important source of information among all Natural Sciences apart from Geography. The students of Geography believed that the university/college appeared to be the greatest sources of knowledge. It is disturbing, however that all of the students referred to books as the source of information really rarely, i.e. 21% of all the responses; the Biology students ticked such answer even less frequently, that is 14.7% of them. On the basis of the results it can be concluded that the students of Natural Sciences gained their knowledge from similar sources.

'Sustainable development' - it is the concept dating back to the 1970s. During the survey the students of Natural Sciences were asked about the place and the year of the implementation of the existing assumptions of the discussed programme. Among four answers, only one was correct. The collected data showed that many people marked the answer accidentally. The correct answer, i.e. the conference in Stockholm in 1972 was marked by 187 people – 33%.

In 1992 at the UN conference in Rio de Janeiro known as the Earth Summit, the document Agenda 21 was acknowledged. The questionnaire involved the requirement of stating the correct name of the document.

Tab. 5. The knowledge of basic documents established during the Earth Summit

Names of documents	Fields of studies									
	Biology		Geography		Chemistry		Maths		Physics	
	N	%	N	%	N	%	N	%	N	%
The Man and the Biosphere Programme	64	29.5	43	37.1	21	18.4	40	41.2	10	41.7
Agenda 21	127	58.5	59	50.9	54	47.4	35	36.1	8	33.3
The Report "Our common future"	26	12.0	14	12.0	39	34.2	22	22.7	6	25.0



Graph 3. The knowledge of basic documents established during the Earth Summit

The students surveyed indicated one of the possible answers: the "The Man and the Biosphere" programme, Agenda 21, the report "Our Common Future". The correct answer was provided by 283 people, which comprises 49.8%. Agenda 21 was marked correctly by 127 students of Biology (58.5%). Among 116 interviewed students of Geography, 59 of them (50.9%) made the correct choice. The correct

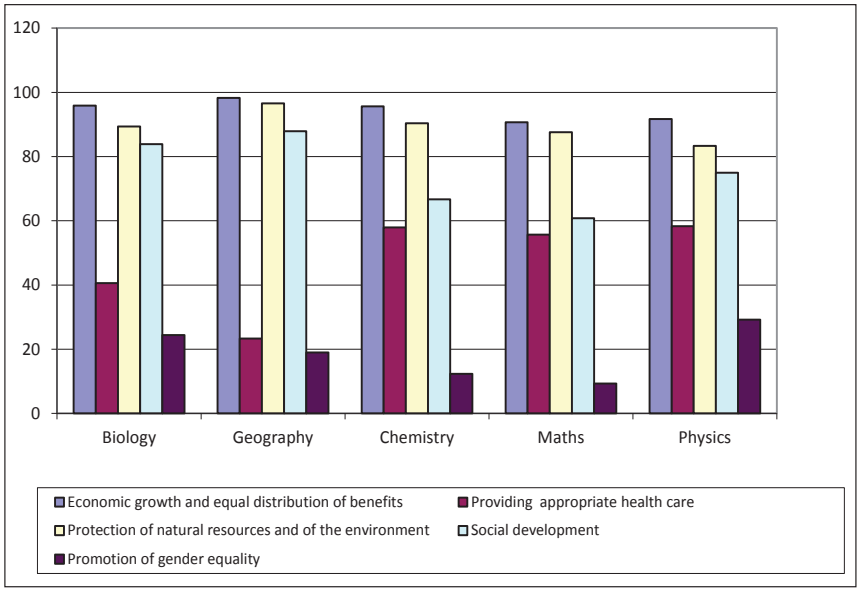
answer was indicated by 47.4% of the Chemistry students, while only 36% of the students of Mathematics and 33.3%. of Physics.

'Sustainable development' is in the field of interest of many organizations. Therefore, the students were asked to indicate such organizations known by them. The insignificant number of responses was gathered, since considering 568 of the interviewed only 62 people (10.9%) provided the name of the organization. Unfortunately, the data indicated that students had not had any information about the subject.

Tab. 6. Assumptions of sustainable development for the benefits of the society

Possible answers	Fields of studies									
	Biology		Geography		Chemistry		Maths		Physics	
	N	%	N	%	N	%	N	%	N	%
Economic growth and equal distribution of benefits	208	95.9	114	98.3	109	95.6	88	90.7	22	91.7
Providing appropriate health care	88	40.6	27	23.3	66	57.9	54	55.7	14	58.3
Protection of natural resources and of the environment	194	89.4	112	96.6	103	90.4	85	87.6	20	83.3
Social development	182	83.9	102	87.9	76	66.7	59	60.8	18	75.0
Promotion of gender equality	53	24.4	22	19.0	14	12.3	9	9.3	7	29.2

* Percentages do not create total -100%, since we deal with multiple choice questions

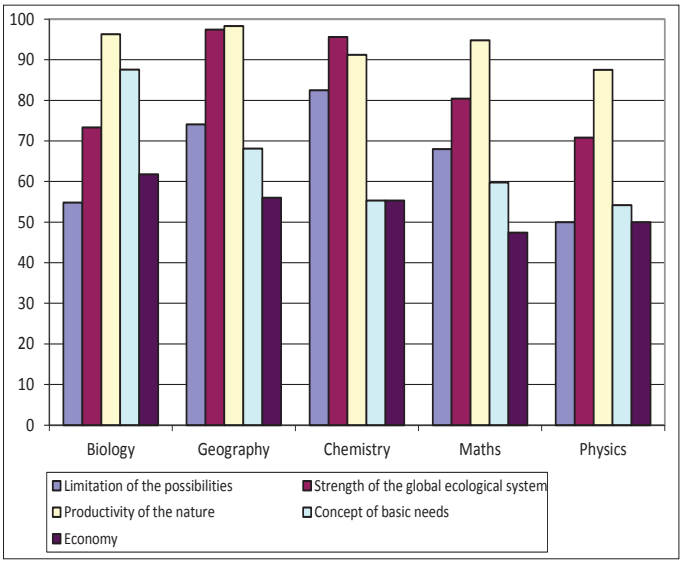


Graph 4. Assumptions of "sustainable development" for the benefits of the society

To achieve the fully sustainable model of social life, one should be aware of and willing to implement rules imposed by sustainable development in their daily lives. It is due to certain actions in some areas of life. The students selected the three assumptions most important to them from the given ones. The analysis of the results showed that the economic growth and equal distribution of benefits were the most common answers (95.9% of the respondents studying Biology, 98.3% – Geography, 95.6% – Chemistry, 90.7% – Maths, 91.7% – Physics), The answers were followed by the protection of natural resources and of the environment (89.4% of the respondents studying Biology, 96.6% – Geography, 90.4% – Chemistry, 87.6%, – Maths, and 83.3% –Physics). Then, the respondents indicated the social development (83.9% – Biology, 87.9% – Geography, 66.7% – Chemistry, 60.8% – Maths, 75% – Physics). The data indicated that the selected answers were very accurate and they were in accordance with the main objectives of the report "Our Common Future".

Tab. 7. Basic assumptions of 'sustainable development'

Possible answers	Fields of studies									
	Biology		Geography		Chemistry		Maths		Physics	
	N	%	N	%	N	%	N	%	N	%
Limitation of the possibilities	119	54.8	86	74.1	94	82.5	66	68.0	12	50.0
Strength of the global ecological system	159	73.3	113	97.4	109	95.6	78	80.4	17	70.8
Productivity of the nature	209	96.3	114	98.3	104	91.2	92	94.8	21	87.5
Concept of basic needs	190	87.6	79	68.1	63	55.3	58	59.8	13	54.2
Economy	134	61.8	65	56.0	63	55.3	46	47.4	12	50.0



* Percentages do not create a total of 100%, since we deal with multiple choice questions

Graph 5. Basic assumptions of "sustainable development"

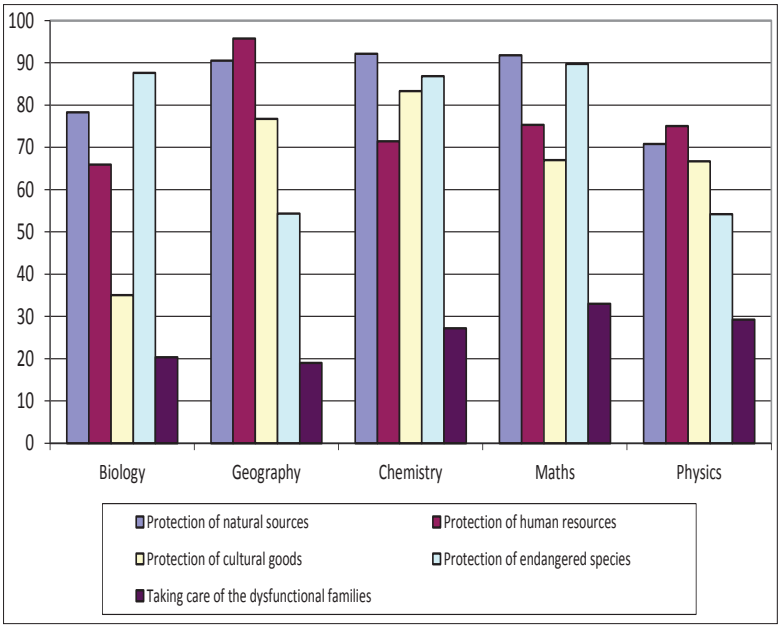
The next question required students to identify the main three principles of 'sustainable development'. They selected them from the five possibilities listed in Table 7. Among biologists the most popular responses were the following: the productivity of nature (96.3%), the concept of basic needs (87.6%), the strength of the global ecological system (73.3%). The students of Geography most often chose the productivity of nature (98.3%), the strength of the global ecological system (97.4%), the limitation of possibilities (74.1%). The students of Chemistry indicated, respectively, the strength of the global ecological system (95.6%), the productivity of nature (91.2%), the limitation of possibilities (82.5%). For the students of Mathematics the most important issue selected by them in the field of 'sustainable development' was the productivity of nature (94.8%), followed by the strength of the global ecological system (80.4%) and limitation of possibilities (68%). The respondents studying Physics marked successively the productivity of nature (87.5%), the strength of the global ecological system (70.8%) and the concepts of basic needs (54.2%).

Tab. 8. Social activity in the realisation of 'sustainable development'

Kinds of activities	Fields of studies									
	Biology		Geography		Chemistry		Maths		Physics	
	N	%	N	%	N	%	N	%	N	%
protection of natural sources	170	78.3	105	90.5	105	92.1	89	91.8	17	70.8
protection of human resource	143	65.9	96	82.8	82	71.9	73	75.3	18	75.0
protection of cultural goods	76	35.0	89	76.7	95	83.3	65	67.0	16	66.7
protection of endangered animal species	137	63.1	63	54.3	99	86.8	87	89.7	13	54.2
taking care of the dysfunctional families	44	20.3	22	19.0	31	27.2	32	33.0	7	29.2

In the next question the students were asked to list the major areas of social activities, connected with the programme of 'sustainable development'. Their task was to identify the three right answers out of the five possible ones. The results were the following: the students of Biology selected most frequently the protection of natural resources (78.3%), the protection of human resources (65.9%), the protection of endangered species (63.1%). Among studying Geography, the preferred responses included the protection of natural resources (90.5%), the protection of human resources (82.8%), the protection of cultural goods (76.7%). Analysing the questionnaires filled in by future chemists, it could be found that they mainly marked the following responses: the protection of natural resources (92.1%), the protection of endangered species (86.8%), the protection of cultural goods (83.3%). The students of Maths indicated successively: the protection of natural resources (91.8%), the protection of endangered species (89.7%) and the protection of cultural goods (89.7%). For the respondents from the institute of Physics the most important elements of the activities connected with the idea of 'sustainable development' were proven to be: the protection of human resources

(75%), followed by the protection of natural resources (70.8%), and the protection of cultural goods (66.7%).



* Percentages do not create total -100%, since we deal with multiple choice questions

Graph 6. Social activity in the realisation of 'sustainable development'

It must be acknowledged that the answers are comparable. It also applied to the sub-point, which was the least frequently pointed out in the various groups of the respondents, namely taking care of the dysfunctional families. Among the Biology students it was ticked by 20.3%, in case of Geography students by 19%, Chemistry students by 27.2%, Maths students by 33%, and Physics students by 29.2%.

In 1992, the Convention was accepted in Rio de Janeiro. It required the countries to develop the national strategies, plans, programmes of the environmental protection and sustainable development. Among the three possibilities presented in the investigation only one was correct, i.e., the Convention on Biological Diversity. Among 568 people interviewed, it was selected by 195 (34.3%) of the respondents. It was different according to different fields of studies, namely, 86 Biology student indicated it (39.6%) while just 41 of the students of Geography (36%), 36 (31%) of Chemistry, 7 (29.2%) respondents studying Physics and 25 (25.8%) respondents from the institute of Mathematics.

To have the effects of the particular project and to have it noticeable, the appropriate range of activities must be distributed so that every unit could have the opportunity to implement certain principles in their lives. It also applies to the issue of 'sustainable development'. The respondents were asked about the range of activities, which should take place in the programme for the main topic of the

work. The answer was simple, since it was supposed to involve the scale of impacts that was as great as possible, and even the smallest administrative units should be involved in the project. Among the four answers the respondents had to choose the correct one. It meant that they should tick the response providing the following information, namely, 'sustainable development' programme activities should take place on the global, national, regional and local scales. Such response was marked by 429 (75.5%) students: 190 (87.6%) student of Biology, 89 (78.1%) of Geography, 77 (66.4%) of Chemistry, 15 (62.5%) of Physics, and 57 (58.8%) of Mathematics. The remaining respondents chose the incorrect answer or skipped the question.

The last question examined the knowledge whether the students selected for the research were able to choose the correct term/concept of 'sustainable development' included in one sentence. It appeared that among 568 interviewed, 495 (87.1%) chose the correct definition, which considered that 'sustainable development' was the process of satisfying the humans' needs having in mind the environment protection. The students of Biology, that is 198 of them (91.2%) provided the correct answers, whereas in the remaining fields the situation was as follows: 98 of Geography, (86%), 97 of Chemistry (83.6%), 77 of Mathematics (79.4%), and 19 of Physics (79.2%). There were also 46 (8.1%) incorrect indications, among which there was the most common interpretation of the problem, i.e. "economical and economic development" as well as "emotional state, in which every child can be". None of the interviewed indicated the response "scientific field", whereas 33 (5.8%) of the respondents did not respond to the question at all.

Discussing the outcomes

After conducting the extensive research dealing with the level of the preparation of students of Natural Sciences to implement the issues of 'sustainable development', it appeared that the hypotheses were not consistent with the reality. Analyzing the studies, differentiated results were obtained. It applied to the information contained in the responses to the individual questions. Due to the significant number of the students, their choices were varied. In many cases it could be noted that the term/concept of 'sustainable development' was known, or associated with something, but too superficially to be able to interpret it individually, or go into its details. It could be due to the lack of the commitment to conscientiously fulfil the received questionnaires, or that the students were not adequately prepared to carry out such issues. The studies showed that the sources of information were diverse, but used incorrectly. It can be proved by the incorrect interpretation of the definition of 'sustainable development', as well as the lack of the awareness associated with the dangers connected with the contact with nature and possibilities of prevention.

The knowledge of the term/concept of 'sustainable development' was not satisfactory, because just a little more than half of the respondents (366 people – 64.4%) knew the term/concept – the correct definition, however, it was known only

by a small number of the respondents, i.e., only 127 people, representing 22.4% of all respondents.

The similar studies were conducted in the time period of 1998–1999 at the Department of Biology and Environmental Protection –The Pedagogical University in Kielce (Polish: WSP) while writing Master's theses. The results are provided by Danuta Cichy:

> Only one third of the students wrote the correct definition. [...] 10.7% of the respondents reported the correct characteristics, but incomplete one. 20% of the students answered incorrectly, and 46% did not answer this question at all" (Cichy 2000).

The research carried out at the department also provided the information obtained about the quantity and quality of the acquired knowledge at various stages of education.

> [...] The young people were asked whether, in their opinion, the knowledge gained at school in the field of ecology and environmental protection was adequate, or if it needed to be developed and supplemented. 67.3% of the young people believed that the information gained on this subject at school needed to be supplemented (Cichy 2000).

The data can be applied to the results obtained from the analysis of the survey based on the questions relating to gathering information about 'sustainable development' for the first time. Students indicated that the amount of demonstrated knowledge was minimal, since only 8.4% of Biology students who knew the term/concept of sustainable development heard about it at primary schools, they gained most of the information at colleges/universities, as reported by 45.8% of the respondents. The results indicated the insufficient interest in the provided contents of ecology and low development of interests at the early stages of education. It could cause lesser sensitivity to these problems in the future.

The level of knowledge about the environment protection and sustainable development, which is inextricably associated with it, is not at the sufficient level. The similar research results are discussed by A.M. Wójcik:

> [...] the results supported the idea that there is little preparation of young people to take action to protect the environment. The level of knowledge in this field does not allow active and fully conscious participation in the implementation of sustainable development, especially due to the fact that young people do not understand this concept [...]. It is necessary, though, to improve the already existing forms of education and to search for the new ones (Wójcik 2002).

By analyzing the data from the conducted survey it can be concluded that despite many potential sources of information and their usage, most of the students indicated the Internet – 79.4% – as the main source of information for the respondents. Only the Geography students indicated university/college (73.3%) as the primary source of information. It is interesting, however, that university/college was generally treated by the respondents as the source of information in the second place (53.2%), and then they referred to television (53%).

Such results are basically confirmed by the conclusions of the research that I conducted with Lesława Nowak. We claimed that:

> The non-formal environmental education is the important part of educating and environmental upbringing. The popularization of the knowledge dealing with the natural processes and their impact on the lives of the societies, not to mention the knowledge of the environment, takes place by providing people with different sources of pro-environmental information [...]. The widest range of influence referred to mass media, such as: television, radio and newspapers [...] (Nowak, Żeber-Dzikowska 1998).

Many people and experts in the field of such issues are aware of the fact, however, that it is the school that educates – brings up and focuses on the appropriate intercourse with the surrounding world. These types of institutions are able to provide the richest resources of knowledge. Conversely, it cannot be always recognized. It is confirmed by the results of the survey, since among those studying Biology only 16% acknowledged the concept of sustainable development at primary schools. The consequences of such situation are discussed by me earlier: "The young people have the insignificant knowledge about the rules of functioning in national parks (60.75%) and in other forms of nature protection areas" (Żeber 2002). The awareness of such issues and the possibilities of being in the opposition to them are argued by Elżbieta Buchcic:

> In the era of implementing the new reform, such contents should be included in the syllabuses, textbooks, and their implementation must include all stages of education, but not only through the formal education. A great role here is played by the informal education addressed to the whole of society (Buchcic 2005).

It is important in the implementation of sustainable development issues to acquire the knowledge of the document called Agenda 21, which is also shown in the consideration of E. Fleszar:

> The assumptions of Agenda 21 should be implemented in practice. The transition from the theory to practical actions should be the aim of all, namely, teachers, pupils, students, as well as parents and children (Fleszar 1998).

The results showed that students had the inadequate awareness of the possibilities of implementing the principles of Agenda 21, proved by the lack of information about the document - only 49.8% of students indicated it correctly, and only 33.3% of the respondents seemed to be able to name its assumptions correctly. Such results cannot calm fears about the state of nature, it can be done, however, by the responses of students from Szczecin (from the teaching workshop), which were mentioned by E. Fleszar. The issues were related to the objectives of environmental education, to acquiring and developing the sensitivity associated with it: "[...] the students had confirmed that they knew the assumptions of the environmental education (98.5%), supporting the development of the ecological awareness as the need for time – 100%" (Fleszar 1998). The obtained data showed

that despite little knowledge of the details dealing with the ecological projects, the students were aware of the implementation of the rules, which allowed for avoiding the destruction of nature.

The absence of some information in the potential of the knowledge of the society as well as the respondents results from the unfulfilled requirements in the range of acquiring the ecological knowledge are the result of the formal education at different stages of education. It may be the consequence of the lack of the teachers' preparation for such types of actions. We can read about the conducted research on such topic among teachers in the article by dr. E. Buchcic:

> [...] It is shown that only 38% of teachers claimed to obtain the content-related and methodological preparation to implement the sustainable development issues at the university/college, moreover, 43% were in favour of the fact, but they did not receive such knowledge [...] (Buchcic 2005).

It can be concluded that, in certain matters, students and teachers, pupils and the public can adequately use the gained knowledge potential. It can also be seen in the aforementioned article by Barbara Parks and Ilona Dzikowska Żeber that:

> [...] in the area of Education for Sustainable Development, it can be stated that the methods and forms of work enable students to acquire the appropriate level of knowledge. The learned skills and shaped attitudes are reflected in the existing actions for the environment (Parka, Żeber-Dzikowska 2005).

It is justified to continue the research further among students of the humanities and pedagogical studies as well as to analyze the future results. On such basis, it can be decided to what extent it is desirable to develop the knowledge, i.e. the knowledge and skills in the range of the current understanding of sustainable development.

Conclusions

The studies aimed at finding the answers to the research question, i.e. if and to what extent the students of Natural Sciences are prepared to realize the issues of sustainable development.

The results of the research studies showed that the preparation of students to realize the issues of sustainable development was not appropriate. The analysis of the results did not confirm the main hypothesis and specific hypotheses.

1. More than half of the students tended to be familiar with the term 'sustainable development', however, only one fifth of the respondents seemed to be able to give their own definition and to interpret the concept correctly.

2. The students gathered the information on sustainable development during the educational activities at all stages of education, however, the greatest amount of knowledge was gained during the university/college lectures and activities.

3. The vast majority of the respondents indicated the Internet as a source of gaining information, far fewer people mentioned other mass media, even rarer than the mass media they indicated the literature.

4. The sources as well as the time of gathering of the information differentiated the amount of the acquired knowledge on 'sustainable development'.

5. The surveyed people were not able to justify the assumptions of the programme scientifically, however, they were intuitively aware of the actions that needed to be taken and practiced thanks to the appropriate lifestyles for the sake of the environment.

6. The majority of the respondents did not know the initial activities that had created the basis for the construction of the idea of 'sustainable development'.

7. The surveyed people were aware of the necessity for an intervention by the public action against the environmental, social, economic threats.

The results of the studies based on the following questionnaire were discussed in the publication "Dydaktyczne tropy zrównoważonego rozwoju w edukacji" (English: "Didactic tropes of sustainable development in education") edited by Ewa Szadzińska in the chapter written by Ilona Żeber-Dzikowskiej, namely, "Wiedza studentów o zrównoważonym rozwoju" (English: "The knowledge of students on sustainable development"). Published by Impuls Publishing House, Cracow 2013, pp. 59–80.

"Questionnaire for students of Natural Sciences"

I kindly ask you to fill in this questionnaire. The questionnaire is completely anonymous and your answers will not be used for any other purpose than to demonstrate the analysis of the results for the scientific research.

Please, fill in the questionnaire in a legible and reliable way.

Prof. dr hab. Ilona Żeber-Dzikowska

Sex:

□ woman

□ man

Field of studies:

……

……

Year of studies :

……

……

1. Do you know the term/concept of 'sustainable development'?

□ yes

□ no

2. Please, define, using your own words, what the concept of 'sustainable development' meas……

……

……

3. Where did you hear about the concept of 'sustainable development' for the first time
- □ primary school
- □ secondary school
- □ university/college
- □ at home
- □ personal sources of information associated with personal interests

4. The information about the concept of 'sustainable development' you get from:
- □ literature
- □ Internet
- □ university/college

5. What sources of information do you use to get the knowledge about the environment protection?
- □ TV
- □ Internet
- □ books
- □ journals

6. Official assumptions about the concept of 'sustainable development' were introduced during the conference in:
- □ Stockholm in 1972
- □ Bern in 1978
- □ Yalta in 1945
- □ Washington in 2003

7. Were the concepts of 'sustainable development' introduced during the educational activities/classes?
- □ yes
- □ no

If yes, where?
- □ primary school
- □ high school
- □ university/college

8. Please estimate your knowledge about the concept of 'sustainable development' using the scale from 1 to 5:

1	2	3	4	5

9. Do you agree with the statement that 'sustainable development' is the development, in which the exploitation of the raw materials and the technical development are kept in harmony so as to maintain the possibility of satisfying humans' needs and aspirations now and in the future?
- □ yes
- □ no

Justify your opinion

……

……

10. In 1992 in Rio de Janeiro during the United Nations Conference on Environment and Development, also known as the Earth Summit, the important document was initiated.

Please mark the correct answer using X

□ The Man and the Biosphere Programme

□ Agenda 21

□ the report "Our common future"

11. Agenda 21 is:

□ International Action Programme – the perspective of the 21st century

□ Act of Environment Protection

□ Economy and Development Programme of the United Nations

12. The legal record of the activity of our country in terms of 'sustainable deve-lopment' can be found in:

□ Regulations of the Minister of Agriculture

□ Environmental Education Act

□ Polish Constitution of 1997

13. 'Sustainable development' is the concept that is of interest of many organizations, i.e. the United Nations Programme for the Environment Protection, the European Commission. Please, provide us with organizations that also deal with this programme:

……

……

14. For the first time, the concepts of 'sustainable development' appeared in:

□ Ecological Student Associations at universities/ colleges

□ environmental institutions

□ German Higher Education Institutions for Forest Rangers

15. The creation of the completely sustainable way of life requires different actions in certain areas. Please tick the most important:

□ the economic growth and equal distribution of benefits

□ providing appropriate health care

□ the protection of natural resources and of the environment

□ the social development

□ the promotion of gender equality

16. 'Sustainable development' is based on three main assumptions. Please tick them:

□ the limitation of the possibilities

□ the strength of the global ecological system

□ the productivity of the nature

□ the concept of basic needs

17. 'Sustainable development' brings together three areas of the social activity among the people. Please select them from the following ones:
- □ the protection of natural resources
- □ the protection of human resource
- □ the protection of cultural goods
- □ the protection of endangered animal species
- □ taking care of the dysfunctional families

18. In 1992 in Rio de Janeiro the convention of making the countries create national strategies, plans and programmes of the environment protection as well as the concepts of 'sustainable development' was established. Please tick the appropriate convention:
- □ ecological
- □ on biodiversity
- □ on environment protection

19. The actions in favour of 'sustainable development' should take place
- □ on the global and national scales
- □ on the local scale
- □ on the regional scale
- □ on the global, national, local, regional scales

20. 'Sustainable development' is understood as:
- □ emotional state in which every child can be
- □ economical and economic development
- □ scientific field
- □ process of satisfying the humans' needs, having in mind the environment protection.

References

Art. 3 item 50. of the Act of 27 April 2001 on Enivronment Protection, J.L. 2001 No. 62, item 627.

Bartkowski T., 1979, *Kształtowanie i ochrona środowiska*, PWN, Warszawa.

Buchcic E., 2005, *Przygotowanie nauczycieli do wdrażania edukacji dla zrównoważonego rozwoju*, [in:] D. Cichy (ed.), *Edukacja środowiskowa wzmocnieniem zrównoważonego rozwoju*, Instytut Badań Edukacyjnych, Wyższa Szkoła Pedagogiczna ZNP, Warszawa.

Cichy D. (ed.), 2005, *Edukacja środowiskowa wzmocnieniem zrównoważonego rozwoju*, Instytut Badań Edukacyjnych, Wyższa Szkoła Pedagogiczna ZNP, Warszawa.

Cichy D. (ed.), 2000, *Podstawy kształcenia dla zrównoważonego rozwoju*, Komitet „Człowiek i Środowisko" przy Prezydium PAN, Warszawa.

Domka L.,1998, *Kryzys środowiska a edukacja dla ekorozwoju*, UAM, Poznań.

Fleszar E., 1998, *Teoretyczne założenia przygotowania studentów – przyszłych nauczycieli biologii do realizacji założeń edukacji ekologiczno- środowiskowej*, Albatros, Szczecin.

Fleszar E., 2005, *Znaczenie laboratorium terenowego dla zachowania różnorodności biologicznej*, [in:] D. Cichy (ed.), *Edukacja środowiskowa wzmocnieniem zrównoważonego rozwoju*, Instytut Badań Edukacyjnych, Wyższa Szkoła Pedagogiczna ZNP, Warszawa.

Gazdowicz Z., 1995, *Edukacja ekologiczna a kultura*, Fundacja ekologiczna, Wrocław.

RP Constitution, 2 April 1997, J.L. No. 78, item 483.

Kozłowski S., 2000, *Ekorozwój – wyzwanie XXI wieku*, PWN, Warszawa.

Nowak L., Żeber-Dzikowska I., 1998, *Nieformalna edukacja środowiskowa i jej rola w kształceniu dorosłych*, [in:] D. Cichy (ed.), *Kształcenie ekologiczne dorosłych*, Instytut Badań Edukacyjnych, Warszawa.

Parka B., Żeber-Dzikowska I., 2005, *Edukacja dla zrównoważonego rozwoju – formy realizacji w świetle badań*, [in:] D. Cichy (ed.), *Edukacja środowiskowa wzmocnieniem zrównoważonego rozwoju*, Instytut Badań Edukacyjnych, Wyższa Szkoła Pedagogiczna ZNP, Warszawa.

Pawłowski A., 2005, *Edukacja środowiskowa dla zrównoważonego rozwoju – wybrane problemy*, [in:] J.W. Czartoszewski, E. Grzegorzewicz, A.W. Świderski (eds.), *Problemy XXI wieku – prawo ochrony środowiska i agrobiznes*, UKSW, Warszawa 2005.

Sarzała D., 2005, *Koncepcja zrównoważonego rozwoju w aspekcie pedagogicznym*, [in:] J.W. Czartoszewski, E. Grzegorzewicz, A.W. Świderski (eds.), *Problemy XXI wieku – prawo ochrony środowiska i agrobiznes*, UKSW, Warszawa.

Szadzińska E. (ed.), 2013, *Didactic tropes of sustainable development in education. Dydaktyczne tropy zrównoważonego rozwoju w edukacji*, Impuls Publishing House, Krakow.

Tuszyńska L., Łyczkowski M., 2005, *Strategia zrównoważonego rozwoju w świadomości warszawskich nauczycieli*, [in:] D. Cichy (ed.), *Edukacja środowiskowa wzmocnieniem zrównoważonego rozwoju*, Instytut Badań Edukacyjnych, Wyższa Szkoła Pedagogiczna ZNP, Warszawa.

Warych P., 2005, *Zrównoważony i trwały rozwój regionów szansą dla polskiej wsi*, [in:] J.W. Czartoszewski, E. Grzegorzewicz, A.W. Świderski (eds.), *Problemy XXI wieku – prawo ochrony środowiska i agrobiznes*, UKSW, Warszawa.

Wójcik A.M., 2002, *Wiedza i poglądy uczniów szkół ponadgimnazjalnych na temat ochrony i kształtowania środowiska*, [in:] *Edukacja środowiskowa. Założenia i rzeczywistość po reformie szkolnej*, Komitet „Człowiek i Środowisko" przy Prezydium PAN, Warszawa.

Żeber-Dzikowska I., 2002, *Młodzież wobec wartości ochrony środowiska*, [in:] *Edukacja środowiskowa. Założenia i rzeczywistość po reformie szkolnej*, Komitet „Człowiek i Środowisko" przy Prezydium PAN, Warszawa.

Żeber-Dzikowska I., 2013, *The knowledge of students about sustainable development. Wiedza studentów o zrównoważonym rozwoju*, [in:] red. E. Szadzińska, *Didactic tropes of sustainable development in education. Dydaktyczne tropy zrównoważonego rozwoju w edukacji*, Published by Impuls Publishing House, Krakow, 59–80.

http://www.ekoedu.uw.edu.pl [Access: 21.11.2007].

http://www.ekoedu.uw.edu.pl [Access: 21.11.2007].

http://www.ine-isd.org.pl [Access: 6.01.2008].

http://pl.wikipedia.org/wiki/Zrównoważony_rozwój [Access: 17.01.2008].

http://www.mos.gov.pl [Access: 6.01.2008].

http://www.ine-isd.org.pl [Access: 8.01.2008].

http://www.wwf.pl [Access: 8.01.2008].

http://www.energia.eco.pl [Access: 8.01.2008].

http://www.kogeneracja.com.pl [Access:: 8.01.2008].

Rio Declaration [online], Access: http://www.ko.poznan.pl/pub/ftp/Edukacja_zrownowazonego_rozwoju/DEKLARACJA_Z_RIO_1992.pdf [Access: 8.01.2008].

http://www.hewdream.org, translation [Access: 23.04.2008].
http://www.hewdream.org, translation [Access: 25.04.2008].

Sustainable Development in the Consciousness of Students

Abstract

Sustainable development – it is the philosophy of the socio-economic development harmonized with respect for the environment. It enables to re-conciliate the efforts of the satisfactory economic result and the deep concern about the social and natural environments. The development of the civilization and the consumerism found in the lifestyles of the society do not always take into account the behaviours which manifest the visualization of the population of the existence in accordance with the rights and respect for nature. The reasons for such situation can result from the variety of the educational neglect as well as the created by the media materialistic lifestyles. However, the awareness level can be significantly improved by the competent preparation of future teachers so as to implement environmental issues and the concept of 'sustainable development' in the educational process. To find out about the level of the respondents' knowledge and to get the comprehensive information dealing with such issues, the research studies involving 568 students of Biology, Geography, Chemistry, Physics and Mathematics were carried out. The studies were aimed at finding the answers to the research question, i.e. if and to what extent the students of Natural Sciences are prepared to realize the issues of sustainable development. The realization of the concept of 'sustainable development' is not possible using legal or economic mechanisms as well as other business – organizational undertakings – if they are not accompanied by the understanding and support of the whole society. The most important changes are primarily the changes in the awareness and attitudes towards the natural and social environments. We live in the era, in which the rapid development of sciences and technology in various fields of life has been taking place. This rapid development, often uncontrolled and in many cases subject to the laws of the ruthless exploitation and consumption, has become, undoubtedly, the force that threatens the existence of mankind. The important problem, then, will be the subordination of social needs and aspirations to the environmental possibilities.

Key words: sustainable development, awareness, knowledge, students, education.

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