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## Education for sustainable development – teachers' competencies, school lessons selected proposals

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### Abstract

Ecological education and education for sustainable development at the turn of 20th and 21st century plays a key role in social-economic development. This education should be first of all addressed to young generation to increase their awareness about environmental issues. The raising and developing of ecological awareness is therefore a great challenge for many teachers. School ecological and sustainable development education aims at non-conflict development of contacts between children or youth and natural environment. The main objective of modern school is education of a man who is not only creative, being able to use acquired knowledge, think independently and act efficiently in different situations, but also the one, who will be able to think long-term, foreseeing the effects and consequences of taken actions for which he will be held responsible.

**Key words:** environmental and ecological education, education for sustainable development, teachers' competencies

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The published article presents research results and discussion concerning subject and teaching competencies of geography teachers and candidates for this profession described in monograph<sup>1</sup> and two articles<sup>2</sup>. The author of this publication has for over ten years conducted research on geography teacher-trainees' development of subject competence and didactic

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<sup>1</sup> W. Osuch, *Kompetencje nauczycieli geografii oraz studentów geografii – kandydatów na nauczycieli*, Wydawnictwo Naukowe Uniwersytetu Pedagogicznego, Kraków 2010.

<sup>2</sup> W. Osuch, The issues of environment protection and development as well as the problem of unemployment in developing the competences of geographers and geography teachers, *Responsible Economy. Scientific and Popular Papers*, 3/2011, pp. 87–96; W. Osuch, The assessment of competences regarding human activities in the environment by geography student-candidates for teaching posts, [in:] J. R. Paško, E. Żesławska, A. Żylewska (eds.), *Badania w dydaktykach nauk przyrodniczych (Research in didactics of the sciences)*, Pedagogical University of Cracow, Department of Chemistry and Chemistry Education, Kraków 2012, pp. 96–106.

competence. The questionnaire form which included closed single and multiple choice questions was used as the research tool. Survey was carried out among both geography teachers – mentors, and geography students. In this publication the analysis focuses mainly on the group of competencies related to sustainable development, in order to show in detail the assessment of teachers' preparation to teach in schools about environmental issues. The aim of the performed research was the self-assessment of the acquired subject and teaching competencies by geography teachers and BA and MA students of geography from different faculties.

In addition, there were shown some examples of specific program assumptions for education for sustainable development training issues in schools, especially secondary schools, and numerous examples of research and discussions in this topic.

## Method of research

Research of competencies was conducted by means of the diagnostic poll method, known as the survey method. The applied research tools were questionnaire, containing mostly closed questions (single-choice and multiple-choice). The survey was conducted among geography teachers in gimnazjum<sup>3</sup> and liceum<sup>4</sup> (mostly in 2009) and geography students from three different faculties of studies at Pedagogical University of Cracow.

## Sustainable development – definitions and most popular examples in mass media

Institute for Sustainable Development defines: “sustainable development is joint and integrated economic, social and ecological problems solving, ensuring the ability to meet basic needs and improving the quality of life of communities, both contemporary and future generations, without disturbing the balance of nature, constantly maintaining basic natural processes supporting life on Earth”<sup>5</sup>. Currently, despite many years

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<sup>3</sup> Gimnazjum – lower secondary school, a three-year obligatory, comprehensive school, attended by students from 13 to 15 years of age.

<sup>4</sup> Liceum – upper secondary school, a three-year comprehensive school with classes with specialisation, attended by students from 16 to 19 years of age. Students finish school with so-called ‘matura’ exam, the equivalent of A-level exams, which is required to enter a university.

<sup>5</sup> E. Osuch, W. Osuch, A. Kassenberg, *Geografia z ochroną i kształtowaniem środowiska. Podręcznik dla zasadniczych szkół zawodowych*, WSiP, Warszawa 2003, p. 223.

of implementation of the concept of sustainable development in the socio-economic life, many policy makers believe that it is impossible to fully reconcile and resolve at the same time economic, social and environmental problems. Such attitude concerns and indicates their misunderstanding of the idea of sustainable development, as well as the lack of willingness to seek compromise in matters important to society, and the lack of making responsible decisions.

Despite the many aspects of sustainable development at various levels of Polish education, it still seems necessary to reach a wider social group, including local government officials responsible for regional development, residents of both urban regions and rural areas – not just young people and school students, who generally positively accept broadly defined issues of environmental education and sustainable development.

Unfortunately, not all results are optimistic.

According to survey investigation on the necessity of pro-environmental action in own commune done by Cichy<sup>6</sup>, adults were in 60% for action in investment and administration, 31% for action in education and 9% of respondents showed lack of interest in these activities.

Below are some examples of different approaches to sustainable development and a lively discussion led, also in the media. These examples have shown that you always need to look for a reasonable solution, but not only limited to the demands of selected social groups.

Interesting results of research concerning the building of by-pass in protected area of Rospuda valley in north-eastern Poland where shown, in which local society were to choose two opposite trends: if they support nature protection or modernisation, understood here as the development of industry and the construction of roads. The largest group (41%) indicated nature, appreciating actions concerning environment protection, 24% of respondents were in favour of progress and modernisation of roads, 27% determined themselves as moderate, that means such which reconcile these opposite trends<sup>7</sup>. However, the author of this study believes that it is possible to reconcile these opposite trends, maintaining a common sense and suggesting such investments and transport solutions which will contribute to improvement of both environment protection in this region,

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<sup>6</sup> D. Cichy, Dekada edukacji ekologicznej wzmocnieniem świadomości i działań społeczeństwa na rzecz środowiska, [in:] E. Rydz, A. Kowalak (eds.), *Świadomość ekologiczna a rozwój regionalny w Europie Środkowo-Wschodniej*, Wydawnictwo Naukowe Akademii Pomorskiej w Słupsku, Słupsk 2008, pp. 117–124.

<sup>7</sup> A. Zielińska, Istota świadomości ekologicznej społeczeństwa w odniesieniu do obszarów przyrodniczo cennych, [in:] E. Rydz, A. Kowalak (eds.), *Świadomość ekologiczna...*, op. cit., pp. 50–58.

as well as quality of citizens' life. The issue of Rospuda valley, presented in Polish media with controversial comments, particularly in 2006, waited until European Union reaction because of partial financial support of the project<sup>8</sup>.

Another example, but with similar doubts, arose about the location, and later the process of building, and even the exploitation of Czorsztyn reservoir and the dam in Niedzica, which are located in the immediate neighbourhood of Pieniński National Park.

The main reasons why Czorsztyn reservoir and Nidzica dam were built were:

- floods control in the Dunajec valley below Czorsztyn reservoir,
- the increase of the available resources of surface water of the Dunajec River due to the need to supply disposable areas with water,
- raising minimum flows of Dunajec and upper Vistula, and also providing smooth flow of these rivers,
- electric energy production by means of pro-ecological method.

The dam construction was built in years 1975–1997. The dam in 1997 during flood, due to its retention capabilities, prevented the tragedy similar to the one that had taken place in 1934. The actions which followed the flood in 1997 proved that the dam had been successful investment, despite numerous protests from ecological organisations whose members were anxious about the possible negative influence which this dam would have on the natural environment. To say it simply, one of the groups that participated in the discussion was against the dam raising ecological, natural, historical and cultural values, the other group claimed that reservoirs are essential to solve the problems of water shortage, flood prevention and production of electric energy.

In reservoir supporters' opinion the construction of the reservoir turned out to be the necessary and useful investment and the flood in 1997 proved that the main advantage of the reservoir, it is decreasing the flood damage, stopped being only the subject of speculations.

Indisputable seems to be also the fact of the development of agrotourism in Nidzica region and in the immediate neighbourhood of the reservoir. Several catering and accommodation facilities have been built along with marinas and bathing beaches around the reservoir<sup>9</sup>.

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<sup>8</sup> W. Osuch, Edukacja ekologiczna w szkole i społeczeństwie a rozwój regionalny, *Annales Universitatis Paedagogicae Cracoviensis. Studia Geographica*, 2010, 1(93), pp. 92–102.

<sup>9</sup> Ibidem.

In recent years, due to hydrological investment and initiatives of local self-governments, the area of Czorsztyn reservoir has become more and more appealing to tourists and holidaymakers. The proper use of natural resources and the publicity of the subsequent undertakings is an incentive for potential tourists and holidaymakers. In the future, the development of tourist infrastructure is planned, although its usage depends on transport accessibility and the latter one depends on the development and maintenance of transport network and the means of organisation of transport services<sup>10</sup>.

A really interesting, local survey research in Świętokrzyskie voivodeship, concerning an ecological awareness of consumers and sustainable consumption, were conducted by I. Fudali<sup>11</sup> (2008), indicating that consumption can be dangerous both socially and ecologically. An average citizen more and more firmly register in his consciousness the fact that the basic effect of economic growth should be an increasing quality of life.

The consumption, however, is one of the most important causes of growing ecological and food crisis. It constitutes a serious obstacle into introducing eco-development. The research carried out into ecological behaviour among consumers of supermarkets in Świętokrzyskie voivodeship indicates the following ecological behaviour patterns among the polled:

1. 42% segregate rubbish, though all only 13% (mainly women and the elderly),
2. 19% use fabric carrier bags (rather the elderly),
3. 67% think, that shopping should be packed into paper bags instead of plastic bags (more women),
4. 12% use shopping baskets,
5. 35% use plastic bags for shopping,
6. 34% use disposable bags,
7. 65% throw out plastic containers to a waste bin,
8. 3% fire plastic containers.
9. 77% throw out rubbish on a trip to waste bin or bag,
10. 17% does not pay attention where they throw out the rubbish,

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<sup>10</sup> W. Osuch, Human activity in the environment and ecology – examples of education for sustainable development in Polish school, *Responsible Economy. Scientific and Popular Papers*, 2/2010, pp. 73–8.

<sup>11</sup> I. Fudali, Świadomość ekologiczna konsumentów w regionie świętokrzyskim, [in:] E. Rydz, A. Kowalak (eds.), *Świadomość ekologiczna...*, op. cit., pp. 104–114.

11. 60% of consumers pay attention while buying fruit and vegetables if they come from ecological cultivation,
12. 32% express readiness to pay higher prices for ecological products,
13. 22% use toilet paper made from recycled paper in 100% (Fig. 1).

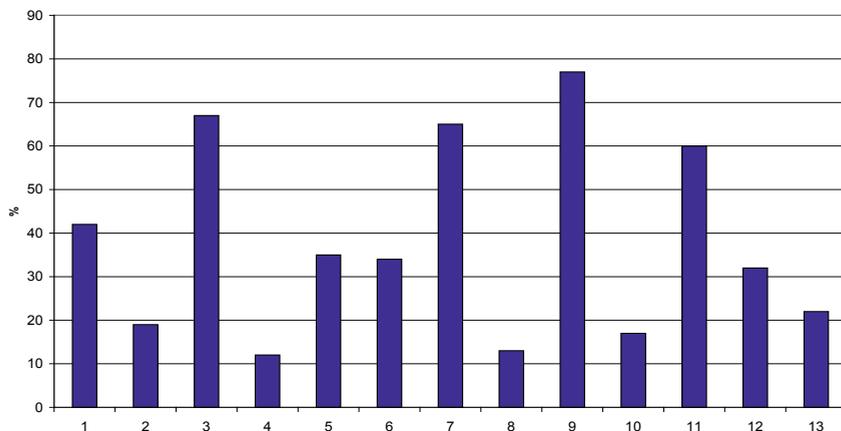


Fig. 1. Selected ecological awareness among consumers of supermarkets

Source: I. Fudali, Świadomość ekologiczna konsumentów..., op. cit., pp. 109–110

Presented results of survey research in Świętokrzyskie region on an ecological awareness of its inhabitants surely seem to be far from satisfactory, but they already show some changes in attitudes and habits of supermarket consumers in pro-ecological behaviour patterns, thus thereby changes in ecological awareness of these people. It is probable, that further survey investigation in a couple of years, will reveal some stable tendency of changes in these consumers' behaviour patterns<sup>12</sup>.

The author of this publication states that the results of this survey investigation would be more satisfactory if the respondents were primary and lower secondary school pupils and not supermarket customers. In addition, it seems reasonable to make such research more frequently among a diverse population, because it is expected that young people – students, show much more environmentally friendly and less consumer behavior than older ones.

<sup>12</sup> W. Osuch, Edukacja ekologiczna..., op. cit.; W. Osuch, Human activity in the environment and ecology..., op. cit.

## Education for sustainable development in school – examples

The issue of sustainable development, also called eco-development, is frequently represented both in the school curriculum, as well as in school textbooks undertaken and implemented consistently, e.g. during geography lessons, both at lower and upper secondary school.

The crucial objectives of environmental education in liceum (upper secondary school) were:

- making students aware of the diversity of the positive and negative influence of people on environment and developing the ability to get familiar with this influence in practice,
- teaching students how to be responsible for the current and the future condition of environment and how to act in support of sustainable development.

The most important tasks of school in this range are:

- making outdoor research available and possible,
- creating conditions which enable students to integrate various fields of knowledge in order to understand the idea of sustainable development<sup>13</sup>.

Educational authorities' increased interest in the problems of sustainable development and the increased interest of students resulted in changes of curriculum and programs for teaching geography at the beginning of the XXI century. Then, in addition to curricular changes in the geography of secondary school, geography as a separate subject was reintroduced (after a few years break) into vocational school program, adding the contents of environmental protection and management. So from 2003 onwards in basic vocational school there is subject "Geography with environmental protection and management". In this program, 11 of the 17 components of the proposed environmental protection issues are related to sustainable development.

Following lesson topics were proposed:

- Basics of sustainable development and its main principles,
- Selected concepts of sustainable development in Poland and in the world,
- A balanced approach to energy,
- A balanced approach to transport,
- A balanced approach to rural areas,
- A balanced approach to forest management and modern environmental protection,
- A balanced approach to urban development,
- A balanced approach to tourism,

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<sup>13</sup> W. Osuch, *Edukacja ekologiczna...*, op. cit., p. 100.

- A balanced approach to consumption,
- Indicators of sustainable development<sup>14</sup>.

Purpose of the core curriculum concerned “preparing for the implementation of the principles of sustainable development and rational management of natural resources in the workplace and in everyday life in a market economy”. While the authors of the curriculum set themselves the following specific objectives of education and upbringing (relating to issues of sustainable development):

- recognition and understanding of the principles of sustainable development in various sectors of the economy and in everyday life,
- shaping the attitude of willingness to participate in the exploitation of natural resources in accordance with the principles of sustainable development,
- understanding of the need for sustainable development of the world, their region, city and country<sup>15</sup>.

The objectives of the core curriculum and developed specific lesson plans were presented in a methodical guidance<sup>16</sup>. The author of this publication will be limited only to present a summary, three selected scenarios of geography lessons on sustainable development.

#### Lesson topic: *Sustainable development – sustainable consumption*

Selected targets of lesson:

- the student indicates on the map areas of excessive and insufficient consumption,
- he assesses the impact of individual and public consumption,
- he indicates the causes and effects of the consumption of tangible and intangible assets.

To the proposed objectives have been developed following procedures for achieving purposes:

- analysis of consumer attitudes and self-comparison of results between students,
- creating the list of examples of substitution: material and personal consumption into nonmaterial and public consumption,

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<sup>14</sup> A. Kassenberg, B. Sienkiewicz-Dembek, W. Osuch, *Geografia z ochroną i kształtowaniem środowiska. Program nauczania dla zasadniczych szkół zawodowych*, WSiP, Warszawa 2002.

<sup>15</sup> Ibidem, p. 11.

<sup>16</sup> B. Sienkiewicz-Dembek, W. Osuch, *Geografia z ochroną i kształtowaniem środowiska. Poradnik metodyczny z programem nauczania oraz sprawdziany osiągnięć dla nauczycieli zasadniczych szkół zawodowych*, WSiP, Warszawa 2003.

- stating the code of “green (pro-environmental) consumer”<sup>17</sup>.

Therefore, it seems to be essential:

- to develop skills of choosing and decision-making, with full knowledge of its consequences,
- to develop skills of their own assessment as a consumer,
- to identify the need for a balanced approach to consumption.

Proposed methods: work with textbook, discussion, “brainstorming”, “decision tree”

Conclusions of the lesson:

- Sustainable consumption takes place when we consume material goods and services that meet basic needs and allow you to achieve a higher quality of life, with a minimum consumption of natural resources.
- Excessive consumption is not meeting the needs of primary, but secondary source, such as desires associated with power dominance, prestige, higher social status.
- A change in consumer habits can be achieved through environmental education to become conscious participant in social and political life of consumers and tourists.

Joint conclusion developed by the students, under the guidance of the teacher, during the discussion of proposals to consumption restraint.

Reducing consumption is possible by:

- change of habits,
- change in the nature and structure of needs,
- reducing availability of material goods,
- higher standard of public services<sup>18</sup>.

The presented case is a big challenge for the teacher, because apparently this topic seems to be uncomplicated and known to students. However, the suggested proposals to be developed during the lesson seem to be difficult and not always understood by young people with consumer life attitudes.

#### Lesson topic: *Sustainable development of the city*

Another topic arousing interest is “Sustainable development of the city”. According to the definition proposed by the authors of the textbook, a sustainable city is the one whose development is guided by social justice, sustainable economic development and care for the natural environment<sup>19</sup>.

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<sup>17</sup> Ibidem, p. 51.

<sup>18</sup> E. Osuch, W. Osuch, A. Kassenberg, *Geografia z ochroną i kształtowaniem środowiska...*, op. cit., p. 254–255.

<sup>19</sup> Ibidem, p. 248.

As an attempt to answer the stated problem (sustainable city) there were proposed discussion, “brainstorming”, role play (example of educational game) and work for each team:

1. The representatives of the residents of a large housing estate in the city – based on your own observations and information from the textbook, make a list of residents' problems. What do people of your city miss?
2. Representatives of urban green company – propose (for consultation) draft of the garden-city, including projects of parks, walkways, balconies and gardens.
3. Representatives of the environmental movement in the city – propose long-term solutions to minimize the negative effects of the massive concentration of population.
4. The representatives of the big city urban planners team – analyze the demographic projections of the city and urbanization processes with the needs of residents – what should be done to improve the quality of life in the city?<sup>20</sup>.

As a conclusion, the proposal of student's responses to subsequent questions:

- What awaits us?
- What solutions shall we create against new threats?
- It depends on each one of us... (student's reflection)

Lesson topic: Sustainable development of transport

I think one has to agree with the thesis of the author of this chapter that the car is in the center of economic and social life, and today it is called car culture<sup>21</sup>.

The objectives of this lesson are:

- to stimulate for reflection on the development of environmentally friendly vehicles,
- to develop skills on evaluating and predicting consequences of the rapid development of the automotive industry,
- to raise awareness and the need for a balanced approach to transport and decision-making<sup>22</sup>.

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<sup>20</sup> B. Sienkiewicz-Dembek, W. Osuch, *Geografia z ochroną i kształtowaniem środowiska...*, op. cit.

<sup>21</sup> E. Osuch, W. Osuch, A. Kassenberg, *Geografia z ochroną i kształtowaniem środowiska...*, op. cit., p. 234.

<sup>22</sup> B. Sienkiewicz-Dembek, W. Osuch, *Geografia z ochroną i kształtowaniem środowiska...*, op. cit., p. 136.

The proposed method is a discussion (may be scored), giving answers to the following questions:

- What solutions contribute to reducing car use?
- What is the beneficial role of these means of transport for health and the environment?
- Give examples of environmentally friendly transport.

Examples above show only some fragments of ideas and scenarios for sustainable development issues. They are also a challenge for teachers to use a variety of methods, including participatory methodologies, to spice up classes for students and liberate their active participation in lessons, as well as trigger the enthusiasm in the search for the best solutions and legitimate decision-making issues of sustainable development in terms of local and regional level.

### Human activities in the environment – assessment of the teachers' and students' competencies

Actually, there are many various definitions and their interpretation of competencies from the perspective of teaching profession. Pedagogues, didactics specialists and pedeutology specialists claim that it is difficult to describe competence with an unambiguous definition.

The latest publications describe competencies as all kinds of knowledge, skills, talents, virtues, experiences and social forms of authorizations, which are regarded by an individual as the sufficient ground for free, subjective activity – effective or even creative<sup>23</sup>.

Competencies regarding human activities in the environment consist of five detailed competencies (Tab. 1). The results obtained vary, but very good and good marks constitute the vast majority. Detailed results of the self-assessment of the acquired competencies by both teachers and geography students – candidates for teachers, are presented on the chart.

Five analyzed competencies concerning human activities in the environment show differences between very good and good marks with a slight advantage of very good marks (5 points) over good marks. Due to limited space only three competencies were presented here (Tab. 1). In this group of competencies liceum teachers received the lowest marks at planning initiatives which would limit ecological risks, where almost 30% of respondents received satisfactory marks (3 points), 32% received good marks

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<sup>23</sup> J. Hartman, *Przez filozofię*, Ureus, Kraków 2007.

Tab 1. The assessment of competences in the field of human activity and environmental protection of geography teachers and students

The scope of selected competences in the field of:	Questionnaire group	The assessment of competences on a point scale*									
		1		2		3		4		5	
		Lp.	%	Lp.	%	Lp.	%	Lp.	%	Lp.	%
the ability to explain the relationship between humans and natural	Gimnazjum teachers	1	1,9	1	1,9	1	1,9	17	32,7	32	61,5
	Liceum teachers	0	0	0	0	6	12,5	13	27,1	29	60,4
	Full time students	1	1,25	0	0	23	28,75	28	35,0	28	35,0
	Post graduate students	0	0	0	0	7	19,4	15	41,6	14	38,9
	Bachelor's degree students	0	0	0	0	10	50,0	4	20,0	6	30,0
planning initiatives which would limit ecological risks	Gimnazjum teachers	0	0	2	3,8	0	0	24	46,1	26	50,0
	Liceum teachers	0	0	1	2,1	14	29,2	15	31,3	18	37,4
	Full time students	1	1,25	4	5,0	32	40,0	27	33,75	16	20,0
	Post graduate students	0	0	1	2,8	6	16,6	16	44,4	13	36,1
	Bachelor's degree students	0	0	1	5,0	8	40,0	9	45,0	2	10,0
forecasting the natural environment conditions for individual areas	Gimnazjum teachers	0	0	2	3,8	2	3,8	22	42,3	24	46,1
	Liceum teachers	1	2,1	2	4,2	8	16,7	21	43,7	16	33,3
	Full time students	1	1,25	10	12,5	31	38,75	26	32,5	12	15,0
	Post graduate students	0	0	1	2,8	12	33,3	15	41,6	8	22,2
	Bachelor's degree students	0	0	5	25,0	8	40,0	6	30,0	1	5,0

\* Marks in school: 5 – very good, 4 – good, 3 – satisfactory, 2 – bad, 1 – very bad (not satisfactory)

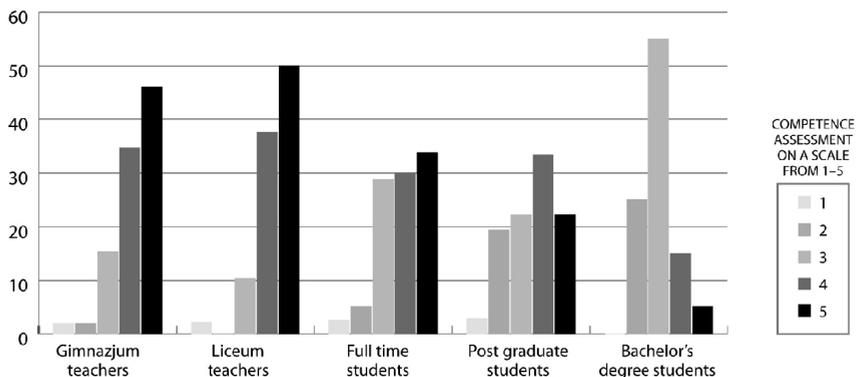
Source: W. Osuch, *Kompetencje nauczycieli geografii...*, op. cit., pp. 251–261.

(4 points). The lowest marks were received also at forecasting the natural environment conditions for individual areas (satisfactory marks – 17%, marks lower than 2 points – almost 5%) and understanding sustainable development. In the latter competence 46% of teachers received very good marks (5 points), almost 35% received good marks (4 points), about 15% got satisfactory marks (3 points) and almost 4% received less than 3 points. The remaining competencies in this group differed in the number of very good and good marks received with the advantage of very good marks (5 points)<sup>24</sup>.

The degree of acquisition of competencies concerning human activities in the environment among students varies. Geography students – candidates for teachers, received poorer marks for the following competencies:

- planning initiatives which would limit ecological risks – as much as 40% of respondents received satisfactory marks and only 20% very good marks,
- forecasting the natural environment conditions for individual areas (satisfactory marks – almost 39%, pass marks – 10%, very good marks – only 15%).

Bachelor's students received poorer marks in the group of competencies concerning human activities in the environment. Satisfactory mark is the dominant one in this group<sup>25</sup>.



**Fig. 2.** Assessment of teachers' and geography students' competencies in understanding the idea of sustainable development

Source: W. Osuch, *Kompetencje nauczycieli geografii...*, op. cit., p. 121

<sup>24</sup> W. Osuch, *The assessment of competences...*, op. cit.

<sup>25</sup> W. Osuch, *The issues of environment protection...*, op. cit.; W. Osuch, *The assessment of competences...*, op. cit.

Despite the fact the issues of sustainable development are often discussed during the course of studies and also by the mass media, still the percentage of competencies in this subject that are not acquired seems to be high (Fig. 2). Gimnazjum teachers received the lowest marks at competencies in sustainable development (Fig. 2). 46% of those teachers received very good marks (5 points), almost 35% of teachers received good marks (4 points), about 15% received satisfactory marks (3 points), and almost 4% of teachers received less than 3 points. Students received marks for the important competence of understanding the sustainable development, which were as follows: very good marks – 33%, good marks 30%, satisfactory marks 28%<sup>26</sup>.

Probably the subject is not explained precisely and thus the notion of sustainable development is not understood and variously interpreted. Understanding the issues of eco-development turns out to be uneasy in ecological education. In survey research, conducted in Mazowieckie voivodeship, only 13% of adult respondents provided correct answers, 60% close to correct, while 27% wrong ones. Furthermore, in self-assessment concerning interest in issues of environment protection and development, 20% of respondents showed a large interest, as much as 68% showed a little interest, while 12% showed no interest in environmental protection<sup>27</sup>.

Another definition of sustainable development (according by Cichy<sup>28</sup>) is understood as such social-economic development, in which the process of integrating political, economic and social actions is following, with preserving of natural balance and stability of basic natural processes in order to guarantee of possibilities to satisfy basic needs of particular society or citizens of both modern and future generations. Sustainable development is also seen as an initiative that requires the broad dissemination not only through natural sciences or related fields, but also at the level of local communities<sup>29</sup>. According to Cichy, an important role in strengthening activities dedicated to education for sustainable development is attributed to the *Decade of Education for Sustainable Development*, whose main objective is to support, through education, efforts to promote environmental, economic, social and cultural sustainable development<sup>30</sup>.

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<sup>26</sup> W. Osuch, *Kompetencje nauczycieli geografii...*, op. cit.; W. Osuch, The assessment of competences..., op. cit.

<sup>27</sup> D. Cichy, L. Tuszyńska, Świadomość i poglądy społeczeństwa regionu mazowieckiego na ochronę i rozwój zrównoważony, *Problemy Ekologii*, 2007, no 3, pp. 139–144.

<sup>28</sup> D. Cichy, *Dekada edukacji ekologicznej...*, op. cit.

<sup>29</sup> Ibidem.

<sup>30</sup> Ibidem, p. 121.

Detailed proposals are:

- a) „inclusion of the idea of sustainable development into the educational system at all levels of education,
- b) promoting education as a factor building strong social bonds,
- c) strengthening the international cooperation in creating innovative strategies and educational programs for the implementation of sustainable development,
- d) constant efforts to improve the quality of education and changes in social attitudes”<sup>31</sup>.

An important question was asked by L. Tkaczyk<sup>32</sup>: Are Polish people ready yet to function according to permanent and sustainable development?

In her research this question was asked to graduates of technical schools, who are studying environmental protection faculties at universities. Almost all respondents define the notion of eco-development correctly and regard it as important for improving the conditions of natural environment. Almost 82% of the respondents is convinced that the style of living should be changed into less material one, but only 23% of those questioned save water, and only 9% of them save electric energy. Despite the positive fact that the threats to natural environment are perceived and people know how it should be protected, it is worrying that respondents were not able to recognize the necessity to protect natural environment in a selfless manner<sup>33</sup>.

There is a well-founded need to raise the level of ecological culture of Polish society by means of the proper education focused on increasing ecological awareness including: knowledge, opinions, developing ecological conscience, imagination and the sense of responsibility based on intellectual, moral and emotional reasons which are the basis for environment protection and development, and for the ability to predict the results of the taken decisions and actions in environment<sup>34</sup>.

## Conclusions

In the process of training of future teachers, including geography teachers, the vital role should be played by competencies acquired mainly during geography studies and vocational training at school. Competencies

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<sup>31</sup> Ibidem.

<sup>32</sup> L. Tkaczyk, *Edukacja środowiskowa drogą do zrównoważonego rozwoju*, [in:] E. Rydz, A. Kowalak (eds.), *Świadomość ekologiczna...*, op. cit., pp. 301–310.

<sup>33</sup> Ibidem.

<sup>34</sup> Ibidem.

regarding abilities to describe the relationship between humans and the natural environment were acquired during theoretical classes at university, vocational training at school, and field training. Interestingly, an inverse relationship can be observed for gimnazjum and liceum. The following conclusions were drawn on the basis of the performed research: the greater the possibility of acquiring competencies at university is (liceum teachers), the less important other forms of training are; the fainter the possibility of acquiring competencies at university is (gimnazjum teachers), the greater possibilities of acquiring the competencies at school and field training are<sup>35</sup>.

Theoretical classes at university (lectures and classes) and field training are important to develop geography students competencies. Teacher training at school is too short to develop, practice and improve a wide range of competencies. The vast majority of full time students points to theoretical classes as the means of acquisition of subject competencies in geography<sup>36</sup>.

Furthermore, examples of schools implementing widely understood education for sustainable development show interesting possibilities of their use, both in school education and increased implementation through other groups – especially the regional development at the level of municipalities, counties, provinces, and undertaking rational decisions.

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<sup>35</sup> W. Osuch, The assessment of competences..., op. cit.

<sup>36</sup> W. Osuch, The issues of environment protection..., op. cit.

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