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The role of Education for Sustainable Development during the postgraduate studies in the field of Environment Protection

Rola edukacji w zakresie zrównoważonego rozwoju realizowanej
podczas studiów podyplomowych z Ochrony środowiska

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Streszczenie. Publikacja przedstawia próbę oceny poziomu świadomości ekologicznej dorosłych osób, podejmujących studia podyplomowe w zakresie ochrony środowiska. Interesujące jest, czy osoby te posiadają już ugruntowane postawy i zachowania w tej dziedzinie, czy też liczą na ich ukształtowanie w czasie kształcenia podyplomowego. Wśród słuchaczy przeprowadzono anonimową ankietę sprawdzającą wiadomości, umiejętności i kompetencje społeczne w zakresie ochrony środowiska. Drugim narzędziem badawczym był arkusz analizy prac dyplomowych złożonych przez słuchaczy przed zakończeniem studiów. Z porównania wyników badań własnych dotyczących słuchaczy studiów podyplomowych i danych przedstawionych w raporcie INE wynika, że osoby podejmujące studia w zakresie ochrony środowiska mają niski poziom świadomości ekologicznej, porównywalny, a czasem niższy od przeciętnego Polaka. Co ciekawe, nie widzą potrzeby prowadzenia edukacji ekologicznej na swoim stanowisku pracy. Z analizy prac dyplomowych wynika, że pewne doświadczenia zawodowe wspierane poprzez aktualizację i poszerzenie wiedzy słuchaczy kształtują ich świadomość ekologiczną, rozwijają aktywność zawodową, ukierunkowując ją na działania edukacyjne na rzecz ochrony środowiska i zrównoważony rozwój. Kształcenie dorosłych na podyplomowych studiach ochrony środowiska wpisuje się w ogólnoeuropejski program sieci EURYDICE – „Uczenie się przez całe życie” (Uczenie się przez całe życie 2002). Powyższa konkluzja uzasadnia potrzebę i sens aktualizacji wiedzy.

Słowa kluczowe: zrównoważony rozwój, ochrona środowiska, świadomość ekologiczna.

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INTRODUCTION

Social circumstances for Environment Protection are tightly connected with the strategy of Sustainable Development that has become even more important after the accession of Poland to the UE. The public discussion about ecology started in 1962 when “Silent spring”, the book by Rachel Carson, an American biologist, was published. This book indicated the relationship between the intensive use of mercury-polluted seeds and the extinction of the local population of birds belonging to yellow-hammers family (*Emberizidae*). Rachel Carson drew people’s attention to the issues concerning ecology and Environment Protection, contributing to the development of global ecological movements. In 1992, during the Earth Summit in Rio de Janeiro, the document called Agenda 21 was developed and signed by the representatives of 179 countries. Agenda 21 contained the program of social actions designed for 21st century as well as the strategy of Sustainable Development, connecting environmental, social, and economic aspects. By definition, Sustainable Development means the social and economic progress that fulfills the needs of the current generation in the way that does not limit the chances of next generations. Such definition, which is widely used nowadays, was formulated for the first time in 1987, in the Report of the World Commission of Environment and Development. Such idea of development links thinking about humankind, animals and plants, ecosystems, and natural resources, such as: water, air or carbon. Moreover, it also points to the most important challenges of the modern world, such as: poverty, social parity, human rights and safety, education available for everybody, health issues, and interactions between different cultures (www.unesco.pl/edukacja). The Chapter 36 of Agenda 21 concerns the Education for Sustainable Development and indicates the necessity of its implementation in schools. Education for Sustainable Development is already obligatory in schools in many countries, however it is not always commonly accepted. Reports elaborated 10 years after the Summit in Rio indicated that Sustainable Development does not proceed sufficiently in many countries, including Poland.

As a result of this insufficiency education was pointed as the priority during the Earth Summit in Johannesburg in 2002. The UN General Assembly proclaimed 2005–2014 as the Decade for Education for Sustainable Development. The

main aim of this international project, directed by UNESCO, is the introduction of Education for Sustainable Development into all steps of education within all disciplines.

Education for Sustainable Development is focused on the gathering of the knowledge and skills necessary for Environment Protection, the development of the society awareness, interest in environmental, social and economic issues, and pro-environmental attitude (Statement regarding Education for Sustainable Development). Currently, education is much more often included into the UE projects concerning Sustainable Development, and in many cases it can be the crucial factor during the allocation of the funds for such projects. A new approach towards the policy of the country shows that there is a great need for the education of instructors who could transfer the knowledge on Sustainable Development to the local governments, administration and schools.

This article presents the results of analysis focused on the assessment of the ecological awareness level among students beginning the postgraduate studies in the field of Environment Protection. It was interesting to verify whether such students had already established attitudes and outlooks, or whether they expected that their ideas and views consolidate during postgraduate studies.

SUSTAINABLE DEVELOPMENT IN THE SOCIAL EDUCATION

The representatives of social and life sciences indicate that in Poland there is no discipline focused on both social and natural development. The Strategy of Education for Sustainable Development was accepted by the Polish government in 2005 in Vilnius. This raised several questions regarding such issues as: who should educate the instructors, and how Education for Sustainable Development should be introduced into the educational basis, if none of the instructors were properly educated.

There is a great need for elaborating and implementing the classes devoted to Sustainable Development into the universities, especially during studies in life sciences, pedagogy and social sciences, as the graduates often work as teachers or civil servants, therefore are responsible for the introduction of Education for Sustainable Development. The scientific discipline devoted to such issues should be created by the universities and proper ministries.

2010 was announced by the United Nations as the year of biological diversity. The idea of biodiversity protection was widely promoted in high schools and universities. The last research conducted by *Eurobarometr* for the European Commission revealed that although the term “biodiversity” is familiar for 60%

of Europeans, only 30% know its exact meaning, and no more than 5% can indicate the results of biodiversity loss.

The Article 13th of the Convention on Biological Diversity postulates that the media should be engaged into the popularization of the issues concerning biodiversity. According to the Convention, biodiversity means the variation among populations of the same or different species. It is crucial to protect the whole natural environment on the all levels of its organization, including both diverse (rich) and limited (poor) ecosystems, and all their elements that have been underestimated or even destroyed so far. Ecosystems that are especially useful for economy, industry or agriculture, containing traditional breeds and strains of animals and plants, should be protected with their whole variety and abundance. The Convention underlines that protection of biodiversity requires both in situ and ex situ actions. It is also necessary for other economic sectors to join and support the actions concerning the biodiversity protection and development of ecological awareness among the people living all over the world (The Convention on Biological Diversity). The IUCN announced the global initiative for the communications, education and social awareness – CEPA. The plan for implementation of this initiative into the countries and regions encompasses:

- elaboration and implementation of national strategies of education, communication and the social awareness development,
- reinforcement of the potential of national institutions, especially those devoted to social education,
- introduction of the biodiversity into the so-called mainstream programs and policy.

The promotion of the Convention should be carried out via the exchange of the experience and knowledge leading to the development of educational programs, elaboration and implementation of effective actions, and international trainings that will become a source of model solutions and best practice.

ECOLOGICAL AWARENESS AND INTERESTS OF POSTGRADUATE STUDENTS IN ENVIRONMENT PROTECTION

The main aim of presented research was the assessment of the level of knowledge and ecological awareness among students beginning the postgraduate studies in the field of Environment Protection. To this end the following questions were asked:

- what was the reason of choosing the studies in Environment Protection field?
Is it linked to the profession and the current place of work of the student?

- what is the level of the knowledge about Education for Environment Protection?
- do students have an opportunity to introduce Education for Sustainable Development to the current place of their work? Do they do it?
- what methods and forms of education are used by them?
- what is the subject of their diploma projects during studies?
- what conclusions were drawn from these projects?

The research was conducted among 55 students living in the Mazovia district who started in 2009 the postgraduate studies in Environment Protection at the Faculty of Biology, the University of Warsaw. These students graduated from both life sciences and humanities. More than half of all students (55%) worked in the National Sanitary Inspection in Warsaw and the Mazovia district. Their studies were supported by the POKL program. Other students undertook the studies on their own. It was interesting to conduct the research focused on the assessment of the expectations, interests and activity of such students in the field of Environmental Education.

It was assumed that students will get and extend their knowledge about life sciences, ecology, Environment Protection, Sustainable Development as well as microbiology, hydrology, and toxicology. Moreover, they should be educated how to put this knowledge into practice, i.e. by making the right decisions concerning the protection of the natural, social and economic environment. The students prepared the diploma projects regarding any specialty they chose, and connected with the professional experience of the graduate. As the diploma project should be based on the latest research in the selected area, this should result in extending the knowledge of students and improvement of their professional skills. Knowledge and skills gained during their studies should focus on the interest of students in Environment Protection and Sustainable Development in the selected area¹. In order to answer the key questions, anonymous survey was carried out among students during the first classes. The report summarizing the analysis of students' diploma projects served as a second research tool.

¹ See: the profile of graduate of postgraduate studies in environment protection.

ANALYSIS OF STUDENTS' DIPLOMA PROJECTS IN THE FIELD
OF ENVIRONMENT PROTECTION AT THE FACULTY
OF BIOLOGY, THE UNIVERSITY OF WARSAW

To determine the level of ecological awareness among students, diagnostics tool and analysis of the students' diploma projects were performed. The survey designed to assess the level of students' knowledge about Sustainable Development, their interests and opportunities for implementation of Environmental Education at their current place of work was carried out at the beginning of the studies. After the first semester of studies students chose the subject of their diploma project, that should have been connected with their own interests. This report presents the analysis of the students' diploma projects, including the selected subject matter, obtained results and conclusions, with special emphasis on those concerning the education of the local communities for Sustainable Development.

ANALYSIS OF RESULTS

Women constituted to 80% of students. Most of students dealt with Environment Protection issue due to professional duties, but only few of them implemented Environmental Education. At the beginning of studies, 40% of students knew the definition of Sustainable Development, while only 30% declared pro-ecological behavior, such as: waste segregation. One half of the respondents used ecological bags while shopping. The main reasons for undertaking the postgraduate studies were: the development of professional skills in the environment management area and the improvement of the professional value. None of the respondents pointed out the need for implementing Education for Sustainable Development at the place of work or among the local community (Tuszyńska, Kral 2010).

Table 1. The individual actions undertaken for the environment by Polish people and postgraduate students

Tabela 1. Indywidualne działania na rzecz środowiska przeciętnego Polaka i Słuchacza PSOS

The type of action <i>Rodzaj działalności</i>	Polish people that undertake such action * <i>Przeciętny Polak</i> %	Postgraduate students that undertake such action <i>Słuchacze Podyplomowych Studiów Ochrony Środowiska</i> %
Separating the waste <i>Segreguje odpady</i>	60,2	50
Using the ecological bags during shopping <i>Stosuje torby wielokrotnego użytku robiąc zakupy</i>	48	50
Being familiar with Sustainable Development term <i>Zna definicję zrównoważonego rozwoju</i>	Not determined <i>Brak danych</i>	40

* A. Bołtromiuk, 2009. The ecological awareness of Polish people – Sustainable Development, IRWiR PAN, Warsaw.

* A. Bołtromiuk, 2009. Świadomość ekologiczna Polaków – Zrównoważony rozwój, IRWiR PAN, Warszawa.

The comparison of the results presented in Table 1 indicates that the level of ecological awareness among students beginning postgraduate studies in the field of Environment Protection is low. Despite the fact that such people are engaged into Environment Protection issue because of their profession, they do not realize the importance of the implementation of Environmental Education at their place of work.

The subject of the diploma projects, analyzed at the end of the studies, are presented in Table 2. Themes selected by students were diverse, although there was a correlation between titles of the projects, and the current place of work of the students. Over 60% of the employees of the National Sanitary Inspection chose the issues concerning the water pollution and the water protection.

Table 2. The issues discussed in the students' diploma projects in Environment Protection at the Faculty of Biology, the University of Warsaw in 2009/2010

Tabela 2. Tematyka podejmowanych prac własnych słuchaczy Podyplomowych Studiów Ochrony Środowiska na Wydziale Biologii UW w roku akademickim 2009/2010

Lp.	The subject of project <i>Tematyka prac</i>	Group I <i>Grupa I</i> %	Group II <i>Grupa II</i> %	Total <i>Razem</i> %
1	Water protection (the projects concerned such issues, as: the methods of refining the eutrophicated water, the assessment of the level of water environment modifications, the influence of water conditioning on its quality, the assessment of microbiological and chemical parameters of water, the usage of the quality monitoring systems for the microbiological analysis of drinking water, the water supply system) <i>Ochrona środowiska wodnego (prace dotyczyły np.: sposobów odtwarzania zeutrofizowanych zbiorników wodnych, oceny stanu i przekształceń środowiska wodnego, wpływu uzdatniania wody na jej jakość, oceny parametrów fizyko-chemicznych i mikrobiologicznych wód lokalnych, zastosowania systemów jakości w mikrobiologicznych pracowniach badania wody, systemów nadzoru nad jakością wody przeznaczonej do spożycia, zaopatrzenia ludności w wodę itp.)</i>	34,5	1,8	36,36
2	Waste management (the selective waste collection, the electronics utilization, the vehicle recycling, the system of the waste management in the commune, the influence of the dumping grounds on the environment, the analysis of the selective waste collection, the community waste management in the local production plants, the waste in the medical institutions, the possibility of the waste paper usage in Poland) <i>Gospodarka odpadami (selektywna zbiórka odpadów, gospodarka odpadami zużytego sprzętu, recykling pojazdów wycofanych z eksploatacji, system gospodarki odpadami w gminie, oddziaływanie składowiska odpadów na środowisko, analiza selektywnej zbiórki odpadów komunalnych, gospodarka odpadami komunalnymi w małych zakładach usługowych, odpady medyczne w zakładach opieki zdrowotnej, możliwości zastosowania makulatury w Polsce)</i>	7,2	14,5	21,81

3	Biodiversity protection (the characteristics of the natural environment in the selected area, the history and nature of the Kampinos National Park, the forms of Environment Protection in the selected district, the Nature 2000 Network in Poland, biodiversity protection in the environmental programs, selective settlement of the niche by selected species of animals) <i>Ochrona różnorodności biologicznej (charakterystyka środowiska przyrodniczego na wybranym terenie, Kampinoski Park Narodowy w ujęciu historycznym i przyrodniczym, formy ochrony przyrody w powiecie, sieć Natura 2000 w Polsce, wybiórczość siedliskowa niektórych gatunków zwierząt, ochrona różnorodności biologicznej w programach rolnośrodowiskowych)</i>	1,8	10,9	12,75
4	The duties of the local governments in the area of Environment Protection (the procedures of environment monitoring by law, the waste management in the communes, the duties of the local governments in the field of controlling the influence of the transactors on the environment) <i>Zarządzanie środowiskiem (procedury ocen środowiskowych w świetle prawa, gospodarka odpadami na terenie gmin, zadania kontrolne samorządów w zakresie korzystania ze środowiska przez podmioty gospodarcze)</i>	0	14,54	14,54
5	Natural resources (the influence of water farms on the environment, the influence of the production and usage of biofuels on the environment) <i>Naturalne źródła energii (oddziaływanie farm wiatrowych na środowisko przyrodnicze, wpływ produkcji i wykorzystania biopaliw na środowisko, wykorzystanie w codziennym życiu człowieka)</i>	5,45	3,64	9,09
6	Air protection (the influence of dumping grounds on the environment, the risk and the prevention in the waste management) <i>Ochrona powietrza przed zanieczyszczeniami (oddziaływanie składowiska odpadów na środowisko, zagrożenia i rozwiązania zapobiegające w obszarze gospodarki odpadami)</i>	5,45	0	5,45

Group I – graduates, the employees of the National Sanitary Inspection

Group II – the other graduates

During presentation of their projects these students revealed great knowledge about the methods of removing excessive elements from the groundwater conditioned for consumption and industrial usage. The quality of groundwater is regulated by the proper regulations. The diploma projects described relationship between community and industrial development, and the progressive loss of quality of water provided by water supply systems. It was stated that this process should be prevented as much as possible. Moreover, the National Sanitary Inspection should react every time when the quality of water does not meet the criteria. The pivotal part of the projects concerning the water pollution and protection issues was the description of different methods of the waste treatment that are commonly used due to their efficiency. The relevance of water quality monitoring was also underlined in such reports. However, it was stated that more attention should be paid to the education of the society that could lead to the prevention the water from the pollution and sewage. The assessment of physical, chemical and microbiological parameters of water was another important part of the projects elaborated by the students working in the National Sanitary Inspection. Three common conclusions were drawn from such analysis:

- “the most controversial parameters of water are too high levels of iron and manganese compounds, and their relationship with the turbidity and the loss of water colour;
- an above-average occurrence of microorganisms incubated at 22 and 36°C was often found during the assessment of microbiological parameters of water;
- it is better to use water coming from water supply system than separate water uptakes”.

The waste management was also popular (22%) the subject matter of analyzed diploma projects. These projects were mostly elaborated by students from the second group, that did not work in the National Sanitary Inspection. Conclusions concerning the importance of Sustainable Development issue for the electronics utilization, the role of Environmental Education of the local community and proper law regulations, as well as the relationship between the lack of financial support, low ecological awareness, and the irregularity in the waste management were presented in such reports.

The authors indicated that Environmental Education should be directed not only towards children and youth, but also towards adults, who produce the community and industrial waste. “Due to the constant increase in the society awareness and the more precisely defined sources of financial support, the system of electronic waste management develops in Poland. Every year more and more electronics are gathered and utilized. The companies competes each other

by encouraging the users to leave the electronics in numerous collection points” – as written in one of the reports. The analysis of these reports revealed that although waste management develops in Poland, it should be more supported by the institutions such as schools, the media, and communes, that are responsible for education and development of ecological awareness in the society. The report of the Institute for Ecodevelopment indicates that 83% of managers are enthusiastic about the new technological solutions to the problems of recycling. This may confirm the interest of the students (people with higher education), participants of presented research, in the waste management issues. Although civil activity of Polish people is low, they start to recognize the importance of citizens’ participation in making decisions concerning their own lives as well as the environment they live in (Bołtromiuk 2009b). Such idea was discussed in the other group of projects (15%), that were focused on the duties of the local governments in the field of Environment Protection. These reports described the possible solutions to the problems connected with the natural environment, the forms of the nature protection, and Sustainable Development in the selected communes. The methods of the systemic management of the environment, regional planning and ecological policy of Poland integrated with the UE was also presented. Sustainable Development was described as a reasonable and necessary solution for the further progress of the civilization. It was also noticed that Sustainable Development should be used by the scientists and politicians as the basis for Environment Protection, while Environmental Education should be one of the most important issues in the ecological policy of the country. Such education should lead to the development of the system of information and knowledge about the environment, available through all stages of education as well as to the local communities. The development of commune centers of Environmental Education as well as the promotion of outdoor classes in the vicinity of the school were indicated as the two major factors in Environmental Education progress.

SUMMARY AND CONCLUSIONS

The graduates of the postgraduate studies in Environment Protection can work as specialists and consultants in the field of Environment Protection in both companies and institutions dealing with the environment management. They are properly educated to cooperate with the local and central governments, or environment conservators, so they could be employed for example in the departments of Environment Protection of the commune offices. Apart

from the activity focused on the assessment of the environment conditions and risks, they should be very active and important propagators of Environment Protection idea among the local communities. In order to efficiently collaborate with lawyers, economists, journalist or politicians the graduates of the described studies should understand the issues concerning Environment Protection. Such collaboration is crucial for the development of the new approach towards the functionality of the community as well as the social and natural environment. Professional experience supported by the extension of knowledge develops ecological awareness of students and promotes their professional activity in the field of Environment Protection and Sustainable Development. Education of adults during the postgraduate studies stays in agreement with the European program of the Eurydice Network – “Education through the whole life” (Education through the whole life 2002). Results and conclusions presented in the current report underline the need and necessity for such education and constant the knowledge updating. This also follows the guidelines of the Strategy of Education for Sustainable Development (Strategy of Education for Sustainable Development 2008) by the improvement of the society awareness via formal, non-formal and informal education. During the studies, students had a chance to realize the importance of the ecological awareness and education not only for the environment management, but also for their own professional development.

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