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Education for Sustainable Development: Experiences of the Student Research Team “Ecologist” at the Belarusian State Agricultural Academy

Abstract. The student scientific team “Ecologist” was established in 2006 at the Belarusian state Agricultural Academy in an effort to bring together students from different disciplines who are interested in solving environmental problems. Research projects are the primary mode for accommodating student interest in environmental learning. Another way of linking the classroom with practical experience is through opportunities for students to participate in campus-wide and outreach environmental activities.

Keywords: sustainable development, research team, students, environmental learning, campus, ecological principles

1. Introduction

The faculty of Agricultural ecology was introduced in the BSAA in 1994. The academy is the only higher education institution in Belarus which trains specialists in ecology for the agri industrial complex. It is both a research and teaching faculty. Considering the importance of non-formal environmental education and knowledge students were given the opportunities to participate in campus-wide environmental activities, to evaluate and discuss agricultural production issues from environmental, economic, and societal perspectives.

To live up to UNESCO’s definition of a sustainable development education that empowers youth with the knowledge, attitudes, motivations, commitments, and skills to solve and prevent the world’s environmental problems, the academy

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provides unique learning environment in which students gain the knowledge, tools and practical experience necessary to achieve the appropriate balance between human needs and sustaining the health of our environment. The culture and values of our university campus date back to 1840 when it was set up in a picturesque place far away from the noise and dirt of big cities. In the process, the campus innovated and applied new practices and technologies that prevent pollution and waste, serving as a model of a green campus for other institutions.

2. Genesis of students' research team

Student scientific team “Ecologist” was established in December, 2006 at the Department of Agricultural Biotechnology and Ecology of the Belarusian state agricultural academy who are continuing the work started in 2006 and are adding new projects and events. It was a bottom-up approach, so students are highly motivated, enjoy being productive and creative participating in activities connected with the ecological issues [Deci & Ryan 2000; Wentzel 2009]. Specific goal was to bring together students from different disciplines who are interested in solving environmental problems. In bringing together students from various disciplines, the aim was to foster a network for communication which could help increase the effectiveness of ecological efforts [James 2014].

Moreover, not only students of agriculture but a wider community should know more about agriculture's role in ecology as farming systems become more complex. This context is found in the “triple bottom line” of economics, environment, and society [Slaper & Hall 2011]. It is necessary to emphasize greater understanding of this triple bottom line in agricultural production in an ecosystem context with the focus on the global trends of increasing population and land-use pressure; diminishing soil, water, nutrient, and energy resources; concern over the negative impacts of agricultural production on the environment; and increasing awareness of the potential ecosystem service benefits from agriculture.

To achieve this the department tries to combine research projects and campus-wide environmental activities and initiatives which promote environmental sustainability and are supported by students, staff and outside organisations.

3. Scope of activity of students' research team

The group hosts regular information panels, speaker series, meet-and-greets with environmental professionals and on-campus conferences, as well as volunteer

events. The students actively work to promote and sustain positive restoration practices on campus and within the greater university community. Many activities are connected with work to reduce the local environmental impacts.

The group met with the head of the Regional inspection of natural resources and environmental protection, discussed the reasons of ecological degradation of water bodies near our town. The main sources of pollution are vegetable garden areas where fertilizers are used extensively, garages, the equestrian school, cattle-breeding farms located near the lakes. Students participated in ecological training which was provided by the organization named "Eco-house" and received a grant to continue their studies. The received grant was used to publish the information booklet on the ecological state of water bodies near Gorki.

The team members hosted some speaker series over the regional radio about their activities and the importance of water in nature and human life. The main activities of the student research team "Ecologist" were reflected in the academy's newspaper articles. The team introduced a variety of sustainability initiatives for its operations. These included the presentation of the environmental fairy-tale in Gorki orphanage considering the impact of fairy tales on environmental education of children. It was about the naughty princess who did not know how to use things carefully. The students also organized a competition for these children "What to do with the waste?" In such a way children are encouraged to feel, understand and act for the environment.

Another kind of activity is "green schools" – communicating science to school pupils on "Ecological problems of the Republic of Belarus," "Global ecological problems," "Sustainable development, Local Agenda 21" and so on. School children participated in the discussion of the offered problems, asked questions and expressed their points of view. We used a new form of communication with children - a role- game (students spoke about the problems of the environment on behalf of the atmosphere, soil, river, forest, stork).

Members of the team participated in the regional activities of the Sustainable Development Week – 2010. The informational and educational seminar "National Strategy for Sustainable Development of the Republic of Belarus" was held at the Department of Agricultural Biotechnology and Ecology. Belarusian state agricultural academy was awarded with a diploma of the Foundation "Living Partnership" for hosting this event.

Students took part in the Belarus competition within the project "Prospects for socio-economic development of the affected by the Chernobyl disaster areas of the Republic of Belarus."

They produced leaflets on waste problem using the Internet (photos and the text in the form of a poem) which were distributed in students' hostels and among schoolchildren.

Members of the team “Ecologist” successfully participated in the International Student Olympiads “Environmental safety”, which was held in the period from 2008 to 2011 in various universities of Belarus, Russia and Ukraine winning prizes every year.

The interaction between students and school pupils, students and pupils of orphanage allows to communicate more effectively in non-formal environmental education.

4. Groundwork for students' activity in Gorky

Ecological programs have as their goal not only to change individual behaviors but also to contribute to both social and ecological processes that foster social-ecological system well-being [Tidball & Krasny 2011]. Implementation of the sustainable development principles in education and training of ecologists in Belarusian state agricultural academy is due to the special atmosphere which is created in the academic town. A place that has a unique cultural and social identity is defined by the way it is used and the people who use it. The surrounding itself inspires students to think about the world they live in.

Academy campus landscapes are an excellent context in which to demonstrate ecological principles in practice. Conserving water by planting locally adapted, native plants; limiting applications of pesticides; providing food, water and shelter for songbirds and butterflies; and restoring degraded habitats are just a few of the methods the students on campus are using. They also provide areas for students to study ecological systems in action. The campus offers students a range of opportunities to apply environmental knowledge in the Botanical Garden, a dendropark, in the experimental fields, on campus.

There are many research initiatives at the farms and centers with an environmental focus. Researches concentrate on the priority areas of the intensive, environmental friendly and resource saving technologies:

- in plant growing – on the development of comprehensive ecological and economically grounded farming systems based on biotechnology, extended reproduction of soil fertility, energy saving technologies, new varieties, fuel alternatives, reduction and mitigating use of pesticides, fertilizers;
- in animal husbandry – on the improvement of resource saving ecologically safe technologies in animal and feed production and farm animals feeding;
- in farm engineering – on the development of technological machines and equipment for safe farm mechanization processes;

– in economics – on the improvement of scientific system of market relations, the formation of multi sector economy, effective performance and information collection in agri industrial complex.

The students are directly involved in the organization of sustainable, ecologically safe agricultural production at the industrial fishery, a model dairy farm, a car diagnostics station, a botanical garden, experimental stations and fields. These resources provide experiential learning opportunities for students, foster good public relations, and set an important precedent for other institutions to follow.

5. Conclusion

The global environmental crisis has put ecological problems to the forefront. The future of all mankind depends on its solution. Responsibility for solving these problems lies on the shoulders of young people. Student scientific team “Ecologist” was established at the Belarusian state agricultural academy in order to draw the attention of young people to environmental problems and to teach them how to deal with these problems. The academy provides unique opportunities for students to gain the crucial skills through what is taught and practiced, both within the classroom and through the management and operations of the campus.

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Streszczenie. Studencki zespół naukowy „Ekolog” został utworzony na Białoruskiej Państwowej Akademii Rolniczej w 2006 r. w celu skupienia studentów różnych dyscyplin zainteresowanych rozwiązywaniem problemów ekologicznych. Projekty naukowo-badawcze są główną metodą zaspokajania zainteresowania studentów wiedzą o środowisku. Innym sposobem łączenia teorii akademickiej z doświadczeniem praktycznym jest możliwość uczestniczenia w studenckich inicjatywach ekologicznych o zasięgu ogólnouczelnianym, a nawet szerszym.

Słowa kluczowe: zrównoważony rozwój, zespół naukowy, studenci, wiedza o środowisku, uczelnia, zasady ekologii