http://www.uchzap.com ISSN 2658-7114 (Print) ISSN 2542-0070 (Online)

УДК 373.1
DOI: 10.21209/2658-7114-2020-15-4-36-43

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Whole-institution Approach in Education for Sustainable Development: Theory and Practice[6]

Education is an important mechanism of sustainable development implementation. Education for sustainable development (ESD) is one of the priorities of international organizations (UN, UNESCO, and other), and national governments from the beginning of the 1990s. Experience generated over three decades of implementation of ESD, as well as theoretical studies show that a whole-institution approach is required for effective furthering of ESD. Withing this approach the priorities shift from including ESD issues into a few selected subjects or events to applying ESD as a foundation for the entire functioning of an educational institution (including management and budget, education, professional development, campus design, resource use, community relations etc). The research presented in the article has been completed using systemic, problematic, and comparative approaches. Ecological systems theory and educational design are suggested as

[1] R. Gleason: analysis of the whole-institution approach implementation in education for sustainable development in the Anglo-American school of Moscow and St. Petersburg.

[2] P. N. Kirillov: research statement, study of international pedagogical experience in the sphere of the whole-institution approach implementation in education for sustainable development, and generalization of the research results.

[3] N. I. Koryakina: analysis of international practices in the sphere of the whole-institution approach implementation in education for sustainable development

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[5] D. S. Ermakov: theoretical and methodological substantiation of the whole-institution appproach implementation in education for sustainable development at secondary school level.

[6] The article was funded by Russian Foundation for Basic Research (research project № 19-013-00722 "Education for sustainable development in action").

theoretical and methodological foundations for the whole institution approach. They point at the need to take into consideration child's natural and socio-cultural environment in designing education systems. The article considers practical cases (for example, international "Eco-schools" network, Anglo-American school and other) which can be replicated in and by other organizations.

Key words: education for sustainable development, whole-institution approach, methodology, theory, practice

Introduction. In 1987 The World Commission on Environment and Development formulated one of the most widely recognized definitions of sustainable development, which is meeting the needs of the present without compromising the ability of future generations to meet their own needs [8]. In 1992 The United Nations (UN) Conference on Environment and Development adopted "Agenda 21" – an international action plan for sustainable development. Chapter 36 of the "Agenda 21" called for inclusion of sustainable development issues into all study programs and curricula[1].

That time marks the beginning of a new socio-pedagogical phenomenon – education for sustainable development (ESD), which is still considered as one of the priorities of UNESCO and is supported by the UN. In 2002 UN declared The World Decade of ESD (2005–2014)[2]. In 2013 the UN adopted a Global Agenda for ESD for the period after the end of the decade[3].

ESD is viewed not as a certain body of information or knowledge, but as the aim of education. T. Shallcross and J. Robison argue that "a situated, whole school action-focused learning rather than behaviourist or cognitive/constructivist approaches to learning offers a better, though not the only, prospect for education to contribute to the development of more sustainable lifestyles/actions" [9, p. 299]. It is necessary that ESD is integrated into international and national policies, institutional management, teacher training, programs of study and quality evaluation. Educators and researchers have to reevaluate their approaches to ESD. Effective evaluation of an ESD system requires a deep understanding of aims and strategies to achieve them, planning cycles, reflection and correction. Such an approach is essential as the issues of sustainability themselves reflect the contemporary world: complex, multiaspectual, lacking one "correct" solution, and concerning multiple stakeholders [5].

The UN Conference on sustainable development ("Rio+20", 2012) endorsed the whole-institution approach to ESD and called for inclusion of sustainability as a cross-cutting concept into curricula of various disciplines along with raising sustainability on campuses and in local communities[4]. The importance of this approach has also been recognized by the Global Action Program on Education for Sustainable Development[5].

Implementation of the whole-institution approach is a far more complex goal than just teaching about the issues of sustainable development or adding new materials to existing courses and training programs. This approach requires placing sustainability in the forefront of all aspects of lives of educational institutions. It means that all aspects of internal functioning and external relations of an organization are considered and re-considered in light of the principles of sustainable development.

Following such an approach each organization makes decisions about its actions within three related areas: campus (management); curriculum (teaching/learning/research) and community (external relationships). It goes beyond the frames of formal education, because it concerns a wide range of issues and stakeholders at different levels of society, including leadership, participation, and responsibility; quality development, youth as part of the participatory processes, staff development in the area of sustainable development and ESD, further training for all stakeholders, campus management (for example, waste management strategies, energy saving, procurement policies etc.), innovation – being open to change and collaboration, communication networks within the institution and beyond it. The whole-institution approach requires reorientation of an institution's strategy and, as a result – of its culture – towards sustainable development[6].

[1] Agenda 21. – URL: https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf.

[2] United Nations Decade of education for sustainable development : resolution adopted by the General Assembly 21 February 2003, A/57/254. – URL: https://undocs.org/en/A/RES/57/254.

[3] UNESCO Global action programme on education for sustainable development. – Paris: UNESCO, 2013. – 28 p.

[4] The future we want (2012). – URL: https://sustainabledevelopment.un.org/futurewewant.htm.

[5] UNESCO Global action programme on education for sustainable development. – Paris: UNESCO, 2013. – 28 p.

[6] Outcomes of the first meeting of the Ad hoc group on strategic planning: the draft concept note for the

2. Research methodology. The research is based on systemic, problematic, and comparative approaches [6]. The first one considers a secondary school and its environment as a combination of connected elements. Application of the whole-institution approach allows to achieve an emergent property – sustainability of an educational system. Application of the third approach is necessary due to complexity of the issue considered – ESD, which has multiple theoretical and practical problems that are yet to be solved. The third approach allows to analyze experience of the whole-institution approach for ESD generated in different countries, identify both obstacles and achievements that can be replicated.

Results and discussion. ESD is an innovative system that requires different approaches, different management, and different methodology for teaching, learning, and raising awareness. Since ESD permeates all aspects of school life, it is necessary to work at each of them, which will cause an "ESD-transformation" of the traditional model of schooling [10]. Such a model calls for ways in which "educational institution becomes a microcosm of sustainable development that stems from sustainability more, than from unsustainability»[1].

The theoretical foundation for the general institutional approach can be found in ecological systems theory by U. Bronfenbrenner [1]. He sees a person's environment as a system of nesting structures. "Microsystem" is a combination of relationships of a developing person and his (her) immediate environment, that includes the person himself (family, school, peers etc.); patterns of activities, roles and interpersonal relationships that a person experiences in a given environment with a specific set of physical characteristics and with presence of people, who, in their turn, have their own temperament, personality, and beliefs. "Mesosystem" is a combination of interacting microsystems in which a person is immersed (for example, home, church, school, work, summer camp etc.). "Ecosystem" contains relationships with at least one structure in which a person is not present physically, but that still influence the developmental situation of the person (relationships at work, mass media, local government, trade, industry etc.). "Macrosystem" is composed of intertwined micro-, meso-, and ecosystems within a given culture, subculture or a broader context (social class, political, ethnic, or religious groups can all be viewed as macrosystems – they are the social structures that have institutional properties such as lifestyles, economic sources, belief systems etc.). An important property of a system is its sustainability. Extremums of disorganization or of rigidity in the structure of the function threaten a potential personal growth, whereas an average level of flexibility creates optimal conditions for human development.

From educational design perspective the ecological system approach is embodied as educational environment – a system of educational and psychological conditions and impacts that creates opportunities for the development of students' actual or potential abilities and interests. For educational environment to have a developmental impact it has to provide a set of opportunities for self-development that includes three major components: 1) spatial – class and other rooms, campus and its territory etc.; 2) social – interactions between all stakeholders of education (students, educators, parents, administrators etc.); 3) psychodidactic – contents and teaching methods, defined by the aims of the process of education.

The UNESCO suggests that "A whole-school approach involves including sustainable development and climate action in all aspects of your school, which can be broken down into four interrelated areas for action: school governance, teaching and learning, campus, and community partnerships. Changes in these four areas are achieved through an ongoing process of planning, action, and reflection"[2].

What and how do we need to teach children so that they have a chance to avoid a global catastrophe? According to D. Orr, it is not as much about "what" and "how", as about "where" to teach? How can one teach a child to care about the environment within the walls of a campus that demonstrates a complete ignorance of both nature and the child? Part of the solution comes from reconnecting human consciousness and the environment, rebuild-

post-2019 (United Nations Economic Commission for Europe Steering committee on education for sustainable development, Geneva, 2–3 May 2019). – URL: https://www.unece.org/fileadmin/DAM/env/esd/14thMeet_SC/Doc/Outcome_1902861E.pdf

[1] National curriculum: the handbook for secondary teachers in England. Key stages 3 and 4. – L: Qualifications and curriculum authority: Department for education and skills, 2004. – 224 p.

[2] Gibb N. A Whole-School approach to sustainable development and climate action: guidelines for whole-school transformation. – URL: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/ED/images/ASPnet_new/PDF/Draft-guidelines-on-Climate-change.pdf.

ing connection between life and the systems provisioning for it [7]. The importance and the promise of buildings as tools for ESD have been summarized by Prime Minister of the United Kingdom (1997–2007) T. Blair: "All new schools… should be models for sustainable development: showing every child in the classroom and the playground how smart building and energy use can help tackle global warming… Sustainable development will not just be a subject in the classroom: it will be in its bricks and mortar and the way the school uses and even generates its own power. Our students won't just be told about sustainable development, they will see and work within it: a living, learning, place in which to explore what a sustainable lifestyle means"[1].

From a practical perspective a whole-institution approach to ESD can be implemented within the following directions: lowering of the environmental impact of the campus and integration of environmental management into the school management practices; involvement of school students into decision making regarding school management and into sustainable practices; strengthening community participation and schools' participation in local environmental decision making; sustainability and ESD awareness raising for school staff to aid integration of ESD into formal and informal learning; updating of school policies to make ESD their central element; ensuring the school is an organization of continuous learning[2].

A study commissioned by Department of the Environment and Heritage, Australian Government in 2004 found that there is a lack of evaluation and research findings to address questions regarding implementation and effectiveness of the whole-institution approach conclusively [4]. Four years later L. G. Hargreaves confirmed those findings: "Despite widespread support for this approach to ESD at national and international levels, there are relatively few concrete examples of schools in which this approach has been systematically implemented. A more common trend appears to be partial implementation of just a few aspects of ESD as curriculum add-ons or experiential learning units. While these approaches provide useful learning opportunities for students, they fall well short of achieving the objective of a whole-school approach to ESD. Where examples of the whole-school approach do exist, they tend to be pilot projects in individual schools rather than a system-wide or school-board approach to implementation" [3].

One of the reasons for such a slow progress can be the fact that an effort for "ESD-transformation" requires a lot of human resources, in particular at research and development stage, when certain awareness and experience is needed to identify the areas of work, priorities and specific measures. This raises the "entrance threshold" and keeps some schools from embarking on ESD-transformation. To address these problems, many governments and NGOs develop nation-wide schemes that provide systemic whole school solutions and offer various support – training, consultations, guidebooks, curricula and etc.

One of the most established examples of such a scheme is the European Eco-schools initiative which started in 1986. In 2005 their progress at national levels has been reviewed [2; 4]. This and another study undertaken by the Australian government show that whole school approaches can be beneficial for both schools and the local communities in multiple ways: 1) improved relationships between stakeholders of the school community; 2) students receive a more meaningful practical experience; 3) ESD brings in innovative approaches for professional growth; 4) schools reduce their environmental impact; 5) school surroundings become healthier and more attractive; 6) schools achieve financial savings due to a more efficient resource use; 7) schools bring in additional resources both from the local community and ESD support networks.

It is of interest to consider a case of the Anglo-American school (AAS)[3] of Moscow and St. Petersburg (Russia)[4].

While the school had no formally adopted curriculum on ESD, its various aspects are covered due to the interest of all stakeholders, including parent community. In general, sustainability issues are included in all aspects of the schools' life. Rather than transferring knowledge about sustainability, the school strives to

[1] Blair's climate change speech // The Guardian. 15.09.2004. – URL: https://www.theguardian.com/politics/2004/sep/15/greenpolitics.uk.

[2] National curriculum: the handbook for secondary teachers in England. Key stages 3 and 4. – L.: Qualifications and curriculum authority: Department for education and skills, 2004. – 222 p.

[3] The Anglo-American School. – URL: https://www.aas.ru.

[4] The campus in St. Petersburg closed in October 2018, by that time both campuses had been transitioning towards a whole-school model of ESD.

provide learners with experience of being part of a community that cares about the environment and of participation in decision making.

Advancement of ESD at AAS is coordinated by a committee that consists of interested staff members and students. Due to the small size of AAS St. Petersburg, the number of members is not limited. The committee meets twice a month to discuss the progress on its decisions. Some of the decisions have been: retrofit lighting to more efficient light-emitting diode lamps; modify procurement policy to include environmental impact of goods purchased by the school; the "6 R" campaign (*Rethink*, *Refuse*, *Reduce*, *Repair*, *Reuse*, *Recycle* [11].

The curriculum at AAS is organized into units. Most of the knowledge about the environment students receive from science courses, which include units on physics, chemistry, biology, physical geography, and astronomy. Dedicated units on ecology / environmental science are present in science curricula for each stage – in primary, middle, and high school.

During the sophomore and the senior years (11 and 12) students can choose one of the sciences for an in-depth course of 180 hours (every day during the entire school year). One of the courses offered is "Environmental science"[1] which is taught at two levels – standard and advanced. The curriculum is developed to satisfy the requirements of Advanced Placement (a system coordinated by The College Board that develops common requirements for courses and develops external examinations like the Russian Unified Exam).

"Environmental science" teaches students about scientific principles, concepts and methodologies that are needed to understand multiple connections in nature, for identification and analysis of environmental problems, for evaluation of relative risks posed by those problems, and to study alternative solutions to environmental problems or their ultimate prevention. The course does not have a set of standards but dictates some general requirements about the share of each major topic. For example, the issues of environmental pollution and its prevention should receive approximately 25–30 % of instructional time. Other topics ("Earth's systems and resources", "Human population", "Land and water use", "Production and consumption of energy", "Global changes") each receive 10–15 % of instructional time.

[1] Environmental science: course description. – Princeton: The College Board, 2013. – 22 p.

At AAS, the course of environmental science ends with a project: students construct a working model of an environmental solution or formulate suggestions to reduce the school building's ecological footprint. Among the student projects are building of a bicycle-based generator, parabolic solar heater, analysis of the school's consumption of paper. Students are also asked to present their projects to students from the lower school.

Sustainability education is supported by a regular use of teaching methods and technologies that help students develop systemic and critical thinking, and a positive experience of group work and cooperative problem solving. Development of the aforementioned qualities is declared by virtually any education system as one of the major outcomes. However, it is less common to see a well planned system that actually develops and measures those qualities. AAS goes through the process of goal setting with students to plan their development of soft skills. Students and their parents receive a regular feedback on development of the skills chosen during joint goal setting.

An effective ESD is impossible within the walls of a building that demonstrates a complete lack of interest in sustainability. On the other hand, the school's environment can serve as a powerful resource for environmental education. AAS uses the following elements that enrich its spaces with environmentally themed installations, for example:

– a model of a wastewater bioregenerator "Living machine"[2] – a system of connected tanks / aquaria that models a freshwater ecosystem able to process nutrients. Watching the functioning of The Living Machine stimulates natural curiosity of younger students. Older students use the machine for lab work and research projects;

– recycling – containers for paper and plastic waste have been designed by students and located in places identified by the student body;

– a vertical garden model on a windowsill, where herbs are grown aeroponically.

Responsible decision making is an essential part of ESD. AAS has a Student Council that advises the school administration on various aspects of the school life. For example, following recommendation of the Student Council, the

[2] Wastewater technology fact sheet. The living machine. – URL: https://www3.epa.gov/npdes/pubs/living_machine.pdf.

school replaced paper towel dispensers with air dryers. Students researched the two options and concluded that the second has a lower environmental impact. Even if the research methodology was not quite accurate, students will certainly benefit from the experience of making positive research-based changes.

While AAS differs from other local schools, its experience can be of interest for education in Russia. One of the areas that makes AAS's approach worth studying is that ESD here develops in a non-linear fashion and organically. In that way its functioning and further development does not require substantial stimulation from the school administration or from external governing bodies.

4. Conclusions. Implementation of the whole institution approach at all levels of education is a an important and pressing goal that will contribute to achieving both local and global sustainability. Secondary schools have a significant potential for this process because they are the places where the foundation for development of a young person's culture us laid. It may also be a foundation for the culture of sustainable development. At present there are only isolated examples of initiatives and projects that involve school communities into a whole institution implementation of ESD. On one hand, they are the evidence that it is practically possible to implement that approach. On the other hand, there is still a need to resolve a number of theoretical, methodological and organizational problems. The prospective of achieving a sustainable future for current and future generations will inspire this work.

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Received: Augus 28, 2020; accepted for publication September 20, 2020

Reference to the article

Gleason R., Kirillov P. N., Koryakina N. I., Ermakov A. S., Ermakov D. S. Whole-institution approach in education for sustainable development: theory and practice // Scholarly Notes of Transbaikal State University. 2020. Vol. 15, No. 4. PP. 36–43. DOI: 10.21209/2658-7114-2020-15-4-36-43.

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Общешкольный подход в образовании для устойчивого развития: теория и практика[6]

Образование – важнейший механизм достижения устойчивого развития. Образование для устойчивого развития (ОУР) выступает одним из приоритетов деятельности международных организаций (ООН, ЮНЕСКО и др.), национальных правительств с 1990-х гг. Накопленные за это время практический опыт, а также результаты теоретических исследований свидетельствуют о том, что для эффективной реализации ОУР необходим общеинституциональный подход. При этом ОУР должно не столько включаться в образовательный процесс в виде нескольких тем по некоторым предметам, отдельных мероприятий, но и выступать базисом для деятельности образовательной организации в целом (включая управление и финансирование, обучения и воспитание, повышение квалификации персонала, обустройство кампус, содержание зданий и ресурсоснабжение, взаимодействие с местным сообществом и др.). Предлагаемое в статье исследование проведено с применением системного, проблемного и сравнительно-педагогического подходов. В качестве теоретико-методологических оснований реализации общеинституционального подхода к ОУР предлагаются экологический подход и педагогический дизайн, указывающие на необходимость учёта природного и социально-культурного окружения ребёнка при проектировании образовательной среды. Представлены при-

[1] Р. Глисон обобщил опыт работы Англо-Американской школы (Москва, Санкт-Петербург) по реализации общеинституционального подхода в образовании для устойчивого развития.

[2] П. Н. Кириллов сформулировал задачи исследования, изучил международный педагогический опыт в области реализации общеинституционального подхода в образовании для устойчивого развития, обобщил результаты исследования.

[3] Н. И. Корякина обобщила международный педагогический опыт в области реализации общеинституционального подхода в образовании для устойчивого развития.

[4] А. С. Ермаков обобщил нормативную базу реализации общеинституционального подхода в образовании для устойчивого развития.

[5] Д. С. Ермаков дал теоретико-методологическое обоснование реализации общеинституционального подхода в образовании для устойчивого развития на уровне общеобразовательной школы.

[6] Статья подготовлена при финансовой поддержке Российского фонда фундаментальных исследований (проект № 19–013–00722 «Образование для устойчивого развития в действии»).

меры организации общеинституционального подхода в школе (в частности, международная сеть «Эко-школ», Англо-Американская школа и др.), которые могут быть тиражированы в иных общеобразовательных организациях.

Ключевые слова: образование для устойчивого развития, общеинституциональный подход, методология, теория, практика

Статья поступила в редакцию 28.08.2020; принята к публикации 20.09.2020

Библиографическое описание статьи

Глисон Р., Кириллов П. Н., Корякина Н. И., Ермаков А. С., Ермаков Д. С. Общешкольный подход в образовании для устойчивого развития: теория и практика // Учёные записки Забайкальского государственного университета. 2020. Т. 15, № 4. С. 36–43. DOI: 10.21209/2658-7114-2020-15-4-36-43.