STUDENS' ECLOGICAL AWARENESS DEVELOPMENT ON GEOGRAPHY LESSONS IN THE REPUBLIC OF KAZAKHSTAN

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Abstract

Relevance of the research: The research is relevant due to the total aloofness of the global environmental policy and the efforts of some states to resolve environmental problems from individuals. This actualizes the task of ecological consciousness and self-awareness development as the foundation of environmental activity of students.

Objective: The aim of the study is to theoretically justify and carry out the pilot and field testing of pedagogical conditions for early teenagers' ecological awareness development on geography lessons in secondary schools in the Republic of Kazakhstan.

Methods: The main methods of the investigation were complex theoretical analysis, categorical synthesis and simulation, allowing to consider the problem of students' ecological consciousness development during special courses.

Results: The article presents the pedagogical conditions of early teenagers' ecological awareness development at geography lessons in secondary schools in the Republic of Kazakhstan, and also discloses a pedagogical potential of ecologization of the school course "Geography" content and educational activities carried out in its framework.

Practical implications: The article reflects experience of practical solutions to the problem of early teenagers' ecological awareness development at Geography lessons in the 6th grade of the secondary school in the Republic of Kazakhstan.

Keywords: environmental awareness, early teenagers' awareness, Science teaching **JEL classification:**

1. Introduction

Nowadays environmental studies and projects are among the priority objects of most of economically developed countries' investments. However, until now environmental activity of the majority of citizens is still low and in many cases poorly constitutive and inefficient. Detachment of global environmental policy and efforts of individual states in the sphere of ecology from problems of specific person plays an important role. Consequently, people perceive such policy and efforts as something external.

Environmental Code of the Republic of Kazakhstan determines active citizenship instilment regarding conservation of nature and respect for natural resources as one of the priority tasks of education in educational institutions, including schools. There is a plan that provides environmental education for educational institutions. It will be implemented by virtue of specialized and interdisciplinary educational programs as well as integration of environmental aspects into existing academic disciplines. This underlines the important role of schools in achieving of this goal. Environmental Code of the Republic of Kazakhstan defines the purpose of environmental education as the formation of proactive attitude of citizens and environmental culture in the society based on sustainable development principles (Environmental Code of the Republic of Kazakhstan). When drafting the Environmental Code, the provisions of the UNECE strategy drafted for education in favor of sustainable development, including the task of creating legislative, policy and regulatory framework for Education for Sustainable Development defined therein, were taken into account. The Code regards Environmental Education as 'a continuous process of education, training, selfeducation and personal development aimed at the creation of a system of knowledge and skills, value orientations, moral and aesthetic relations, providing responsibility of a person for the environment' (Government of the Republic of Kazakhstan 2007 p. 4).

According to the Report on the implementation of the UNECE strategy drafted for education in favor of sustainable development in the framework of UN Decade of Education in favor of Sustainable Development (2005-2014), submitted by the Republic of Kazakhstan, regulatory strategy is implemented as follows: 'The law of the Republic of Kazakhstan number 319-III "Education Act" reflects the implementation of such principles of sustainability report, as continuity of learning process, equality of rights of all to qualitative education, respect for human rights and freedoms, priority of civic values, human life and health, democratic nature of education management'. Such principles of the state policy of Kazakhstan in the field of education as priority of the education system development, humanistic and developing nature of education, unity of training and education should be mentioned in the context of education in favor of sustainable development. Although "Education Act" of the Republic of Kazakhstan doesn't contain specific provisions concerning the sustainability report, it establishes a general legal framework for solving such problems in the field of education in favor of sustainable development. The provisions of sustainability report are considered in the section of educational area 'Natural science'. In the first case, the legislative framework is largely defined in relation to environmental education, covering categories of formal, informal and casual learning. At the same time, the law on education allows to solve the problems stated in the sustainability report involving much wider range of people in the framework of formal education in educational institutions. The Environmental Code is a fundamental act of environmental legislation' (Government of the Republic of Kazakhstan 2015).

The National Report of the Ministry of Energy of the Republic of Kazakhstan "State of the Environment of the Republic of Kazakhstan", published in 2015, identified the main strategic and program documents of the Republic of Kazakhstan, which determine the direction of environmental infrastructure development, special attention is paid to environmental education and instruction (Ministry of Energy of the Republic of Kazakhstan 2015).

14th December 2012 addressing the nation the President of the Republic of Kazakhstan N. Nazarbayev announced the region's development strategy "Kazakhstan 2050". Change in the citizens' attitude towards water and natural resources and environmental conservation was called one of the priorities of the strategy. The citizens' change of attitude and outlook towards environmental safety is possible by the modernization of environmental education (President of the Republic of Kazakhstan 2012).

According to the Concept of State Youth Policy until 2020 "Kazakhstan 2020: The Path to the Future", the developing of new environmental ethics is one of the defining values in the process of youth socialization, their involvement in social and political life of the country (Government of the Republic of Kazakhstan 2013). The State Program for Education Development for 2011-2020 in the Republic of Kazakhstan provides further strengthening of the environmental training of students and updating of supplementary education content.

2. MATERIALS AND METHODS

2.1. Research Methods

Theoretical, empirical, mathematic statistics methods are used in the study. Theoretical methods includes complex theoretical analysis, categorical synthesis, simulation. Empirical methods includes diagnostic (questionnaire, Method of Expert Estimations), interactive (individual methods, collective group methods, search methods), formative (formative pedagogical experiment). Among methods of mathematical statistics are comparative analysis of data, differences significance analysis (U - Mann-Whitney criterion, I * Fisher angular transformation).

2.2. Experimental research base

Secondary school number 38, Aktobe city, Kazakhstanserved as experimental research base.

2.3. Research Stages

The research was conducted in three stages.

On the first stage the issue was examined in the theory and practice of psychological and educational research, theoretical analysis of the problem was conducted, the goal, objectives, hypothesis of the research were formulated, ecological awareness developing experience in the process of education was analyzed.

On the second stage experimental work methodology was developed, primary diagnosis of control and experimental groups of students was conducted, formative experiment was implemented.

On the third stage research results were summarized, systematized and analyzed, research conclusions were formulated.

2.4. THEORETICAL BASIS OF THE RESEARCH

Solution of the task of children and teenagers ecological awareness is significant both for global community as a whole and for each country in particular. As the features of person's environmental self-consciousness and of self-consciousness are the same, such components as active, reflective, cognitive, emotional ones can be a benchmark both for ecological consciousness formation diagnosis, and for its development and formation.

Review of studies by L.M. Dautmerzaeva (2003), N. Yu. Yemelyanova (2005), V.N. Nakonechnyh (2008) shows that the understanding of human behavior determination methods is crucial in the course of developing environmental awareness, providing choice and implementation of a person's environmental activity and behavior. As a rule, a child bases his knowledge of how to interact with the environment on the observation of how these activities are carried out by society, various social institutions, by other people. Presentation of environmental issues in the content of school education is based on the same principle. That is knowledge of the system of relations between people and the environment is based on samples detached from a student himself, external as regards to him. In this case, usually, schools, particularly teachers, do not intend to control, trace the extent to which a person projects such samples on himself, subjectifies them, acquires personal attitude to them, converts external social values, norms, requirements into personal values, beliefs and suggestions. However, as it was shown above, the formation of ecological consciousness as a determinant of individual environmental behavior involves the development of its subjective components, giving a grounding for a student for self-perception not as an observer, but as a subject of ecological relationships.

As Sitarov (2012) showed, primary environmental concepts and knowledge about natural environment in local lore format of perception of the worldare formed at the elementary school. Teaching should be logical, consistent, with reliance on the image thinking, involving of arts and aesthetic activities. Foundations of ecological outlook as a holistic co-participant understanding of the nature are laid at this age. Basis of scientific knowledge of the natural environment is formed, instilment of awareness of the need to protect it, digestion of norms of behavior in the environment take place and the skills of elementary environmentally competent actions are instilled. Each subject studied in elementary school (First language, Arts, Music, Handicraft, etc.) discloses a new natural history material, enriches and helps to develop communication skills with natural objects (Sitarov 2012).

The Science courses becomes the main channel of formatting students' ecological concepts at Secondary school. On its basis integrated holistic picture of the correlations between all living things on earth and in space is formed in a single plan of the organization of life in various forms and levels of its manifestations. Didactic support of ecological thinking development of students and formation of "ecologized" moral values, corresponding to adolescence take place. Methods and forms of active, problematic, heuristic-game training are drawn up, as well as some forms of practical interaction with nature. The educational

purpose for this age group (11-14 years) is the formation of positive attitude of children towards the environment. Such disciplines as Geography, Biology, Literature, Physics and others may help to instill such attitude (Sitarov 2012).

Students' environmental concepts are consolidated, deepened and systematized, moral and ecological orientation is increasing at High school. The training develops dialectical understanding of unity between nature and society, meanwhile environmental orientation becomes a part of human culture. At this stage, holistic ecological outlook is building on the basis of integrative knowledge about the natural world providing for responsible, active environmental behavior (Sitarov 2012).

In accordance with the curriculum of general schools of Kazakhstan, environmental education issues are included in the content of following courses: Chemistry in 8-11 grades (topics: "Oxygen", "Hydrogen", "Water", "Nitrogen", "Carbon", "Metals", "Chemical production"), Geography in 6-11 grades (topics: "Geographical envelope", "Nature and population of the area of a school's location", "Relationship between nature and society", "Nature of Kazakhstan", "Inland waters of Kazakhstan", "Soil and ground resources of Kazakhstan", "Biological resources of Kazakhstan", "Diversity of natural complexes of Kazakhstan", "Bacteria, viruses, fungi", "Varieties of Plants", "Animal Variety", "Human as a species", "Relations between organism and environment. Bases of ecology", "Biosphere and scientific-and-technological advance").

Being the behavior regulator, self-consciousness manifests itself as a dialectical system that provides person's self-consciousness and self-control of subjectivity on the basis of personal perception of social patterns, values, norms and regulations. The peculiarity of environmental consciousness in this sense is that an individual perceives himself as a subject in relationship with the environment, in other words, with his environmental subjectivity.

As Dautmerzaeva (2003) noted, tSciencet secondary school has the greatest potential in the formation of knowledge about nature, world and human in it. Each of the subjects of the course helps students to generate their own specific view at human and environment, developing objective worldview as the result.

Solovyev (2005) says that school Geography course, being at the junction of natural and social sciences, has a powerful educational resource for of students' ecological awareness formation.

Thus, the task of adolescents' ecological consciousness formation can be successfully solved by the ecologization of Geography course. Reliance on personal cultural approach to the educational process organization and student-centered education technology while developing and implementing a set of additional teaching materials of pro-ecological orientation of Geography course has proven its effectiveness.

3. <u>RESULTS</u>

3.1. Pedagogical conditions for early teenagers' ecological awareness development on geography lessons in secondary schools

In the introductory Geagraphy course, the early teenagers' education process has its own specific features due to students' age specifics. Understanding and accounting of these features will help a teacher to make learning more efficient, to create the necessary positive attitude, high motivation of educational activity.

A typical young teenager is still strongly influenced by habitual student schemes learned in elementary school, but his needs are been already changing Communication along with expanding cognitive needs start to play an important role. All spheres of life, including the learning process itself, new knowledge, mental activity methods – everything is viewed through the prism of relations with peers.

In many respects the interest of early teenagers in academic subjects is associated with the quality of teaching, whether a teacher is able to present educational material in fascinating manner, to create friendly atmosphere in a classroom. Gradually, on the basis of filling of cognitive needs, persistent cognitive interests and cognitive motives appear.

Cognitive interests can be activate in three ways: presentation of educational material, organization of educational activities and interaction of educational process participants.

When presenting training material it's important to consider novelty factor of its content, possibility to enrich and update already available knowledge, to asses the new material in its relationship with well-known phenomena, facts, in the dynamics and historical development. It is essential to take into account achievements of contemporary science and correlation with practice. When organizing of their activities teachers should pay more attention to the variety of the both group and individual forms of activities, possibility to learn new ways of activity and acquiring of new knowledge by learners, problem tasks. Creative, research and practical work have high motivating potential.

When building relationships between participants of an educational process, it is important to pay attention to the authority of a teacher as a conductor of new knowledge. His emotionality, enthusiasm, confidence form the emotional tone of students' learning activities. Pedagogical optimism, faith in cognitive capabilities of students; mutual learning and mutual support not only of learners but also in student-teacher tandem are very important. Competitive spirit and positive encouragement also create the necessary mood and overall student enthusiasm.

Non-standard lessons, such as students' conference, business game, dispute, research help to implement cognitive potential of younger teenagers in the most successful manner.

In our opinion, the most promising and flexible theoretical basis for the educational process organization is a paradigm of student-centered education. An analysis of the scientific literature on the issue of student-centered education has shown that the understanding of this approach at different times varied widely among different researchers, up to offering opposite points of view.

For example, V. V. Serikov (1998 p. 228) sdefines student-centered education as a pedagogical process with specific objectives, filled with relevant content and supported by technological solutions, which is focused on the development and self-development of personal characteristics of an individual.

Analysis of studies containing the description and analysis of ecological awareness development experience allowed us to conclude that, regardless of the age characteristics of students, training approaches and education level, the specificity of ecological consciousness formation objectives determines the expediency of such educational technologies, methods and techniques of training as:

- game technologies,
- methods of personalization by creating student-relevant situations,
- interactive methods,
- reflection methods,
- problem-tasking techniques,
- methods based on modeling and simulation of activities,
- design methods.

Therefore, relying on existing studies, early teenagers characteristics, personal and culturological approach to the organization of educational process and technology of studentcentered education and on the basis of the program adopted by Order of the Minister of education and science of the Republic of Kazakhstan number 367 of 9th July 2010, we developed a set of additional teaching materials of pro-ecological orientation for learners studying Geography course in the 6th grade.

3.2. Stages of an experimental research

For the purpose of students' ecological awareness developing in 2014-2015 academic year we conducted a pilot research on the basis of secondary school number 38 in the city of Aktobe, Kazakhstan in 6 "A" and 6 "B" forms. The structure of experimental research can be divided into four stages: initial diagnosis, formative experiment, final diagnosis, analysis of the results.

The first stage included the conduction of overall assessment of environmental knowledge of students, their emotional attitude to environmental phenomena and motivation of ecologically relevant behavior implementation.

The objective of the second stage included search and selection of appropriate goals and objectives of the research methods and techniques involved in learning process, aimed at the

formation of ecological awareness of the students of form 6 of secondary school who attended introduction Geography course. The results formed the basis for developing a set of additional pro-ecological oriented teaching materials for Geography course studied by the 6th form students.

In the course of the third research phase implementation we developed projective technique-diagnostic questionnaire aimed at the determination of ecological awareness development grade of the 6th form students.

Ecologization of Geography course for 6th form is aimed at the promotion of early teenagers' ecological awareness development. Pedagogical influence methods were selection and worked out based on the knowledge of the age characteristics of the educational activity and components of consciousness: cognitive, emotional, active and reflexive. Each method is aimed at the activation of self-consciousness components complex, ensuring of their interaction and generation of self-consciousness act on this basis. The students' behavior, including speech (answers to questions, participation in discussions, preparation of messages) is more indicative of the self-consciousness act effectiveness.

3.2.1. Ascertaining stage

For the initial diagnosis of the control and experimental groups we developed a questionnaire to assess knowledge about environment, emotional attitude to environmental phenomena and motivation of implementation of environmentally relevant behaviors. In the questionnaire, students are provided with a series of statements and asked to choose the degree of agreement with the statements. The degrees of agreement with a statement are arranged according to four-choice Likert scale: strongly agree – somewhat agree – somewhat disagree – strongly disagree. The advantage of this scale is that the statements of the questionnaire based on this scale are selected according to their internal consistency, and do not require expert analysis. The questionnaire is divided into three scales: knowledge, emotions and actions. A high total score in each of the scales, calculated in accordance with the key of the questionnaire indicates the intensity of the corresponding component of environmental awareness. At the initial diagnosis stage we didn't target to identify reflection ability.

Initial diagnosis showed that the control and experimental groups have a similar level of preparation before the experiment.

3.2.2. Formative stage

At the formative experiment stage extra-educational and extra-curricular activities of environmental orientation were offered to students of the experimental group in the Geography course. These activities were smoothly included into the basic program of the discipline.

For example, such as:

1. Games and activities:

- Annual environmental project "Green City";
- Environmental diary;
- Game "Geographical names";
- Game-quest "Desert Island";
- Scaled experiment "How much water on Earth is there?";
- Story-poster "Water of the World";
- Simulation game "Totem";
- Tale-parable "Seven secrets of life";
- Game "Microjourney";
- Game-walk "Detectives";
- "Environmental Code of the Earth's inhabitants".
- 2. Environmental tasks, for example such as:

1. Often, you can hear: "Modern science can't find a way to kill mosquitoes". They do so much harm to human and animals indeed. Is that so? Imagine that such a remedy is found. Will be humans right if they take advantage of it?

2. The draining of swamps causes much damage to forests, not only to ones that are located not far from them but also to ones that are tens of kilometers away from the swamps.

Why are forests damaged in spite of the fact that reclamation works are carried out on swamps?

3. A layer of tin protects cans against corrosion. Cans discarded by tourists lye for decades, spoiling the nature. However, it's not a problem in the North because at low temperatures tin crumbles into powder, and the ferrum deprived of the protection quickly rusts and disintegrates too. How to protect southern regions where there is no frost against littering with cans?, etc.

3.2.3. Control stage

For the final diagnosis we developed projective methodology, questionnaire with stimulus material, which included 20 cards with images and names of the appearance depictured. Under the image a probationer will find four questions reflecting the formedness of environmental awareness components:

1. What do I know about it? - cognitive component

2. How do I feel about it? - emotional component

3. What can I do today? - activity component

4. What can I do in the future? - reflective component.

The images show the most famous and significant environmental threats, as well as environmental values, such as:

1. Utilization of batteries and accumulators

2. Vehicle exhaust

3. Greening, etc.

At the end of the school year the students of the experimental and control groups were asked to perform the task contained in projective techniques, questionnaires. The data were processed and analyzed by means of mathematical statistics.

Subsequent to the results of the formative experiment, included the introduction of set of additional teaching materials of pro-ecological orientation into Geography course for the 6th grade, the final diagnosis was carried out of students of experimental and control groups using projective techniques and questionnaires diagnostics of ecological awareness development of 6th form students. Each image on the diagnostic cards of projective technique-questionnaire is followed by four questions, reflecting the pro-ecological profile of a student's awareness. These questions include four aspects: cognitive, emotional, active, reflective. Each answer of the test was rated on a scale by means of expert appraisal (see. Table 1 and Figure 1).

	Control group	Experimental group	
Cognitive	46.9	91.5	
Emotional	59.8	90.2	
Active	50.0	89.3	
Reflective	49.8	87.6	

Table 1.	Groupwide in	dicators of f	formed s	tudents'	awareness	components (based	on proj	jective	
questionnaire technique)										

The data is graphically presented in Figure 1.

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Figure 1. Percentage of groupwide indicators of formed students' awareness components in control and experimental groups (based on projective questionnaire technique)

According to statistical processing, analysis and interpretation of the results of the experimental study, the differences between the components of ecological consciousness in the control and experimental groups after the implementation of the formative experiment are statistically significant. Therefore, we can say that the developed set of additional teaching materials of pro-ecological orientation for Geography course for the 6th grade students contributes to the ecologization of Geography course and early teenagers' ecological awareness development.

4. DICUSSIONS

As shown in the works of some researchers, the most favorable period for the consciousness formation and developing in general (Sitarov & Maralov 1987) and for environmental awareness in particular (Chesnokova & Shorohova 1977, Yasvin 2000) is younger adolescence.

The range of Sciences taught in school, including Geography and Biology has the greatest potential in the formation of knowledge about nature, world and human. Each of these disciplines forms a specific view at human and his environment, resulting in the fact that students develop objective picture of the world. Consequently, the beginning of their teaching (in the Republic of Kazakhstan - 6th form) starts at the most sensitive period in the context of formation of ecological consciousness of a person. Located at the junction of natural and social sciences, Geography has a powerful educational resource for students' ecological awareness developing. The understanding of this fact and consideration of early teenagers' sensitiveness suggest that the initial Geography school course has significant potential as a resource for developing ecological consciousness and ecological culture of a person.

5. <u>CONCLUSION</u>

The greatest potential in the formation of knowledge about the nature, the world and human in it has the range of natural sciences taught in secondary school. Each of the subjects of this range helps to generate the specific view at human and environment, resulting in the formation of students' objective worldview.

School Geography course, being at the junction of natural and social sciences, has a powerful educational resource for formation of ecological consciousness of students.

The most perspective and flexible theoretical basis for the organization of educational process is a paradigm of learner-centered education. Personal and culturological approach of E.V. Bondarevskaya is the most consistent with our position, it aims at: development of human and cultural potential, laying of the mechanisms of self-realization, self-development, adaptation, self-control, self-defense, self-education with the aim of creation of a distinctive personal image, dialogue interaction with others, with nature, culture and civilization in general.

Thus, the task of early teenagers' ecological awareness at Geography lessons in the 6th grade can be successfully solved by the ecologization of Geography course. Applying personal-cultural approach to the educational process organization and student-centered education technology while developing and implementing a set of additional teaching materials of pro-ecological orientation of Geography course has proven its effectiveness in the experimental research.

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SUMMARY

Nowadays environmental studies and projects are among the priority objects of most of economically developed countries' investments. In the Republic of Kazakhstan several Acts on environmental protection and education are implemented, including Environmental Code of the Republic of Kazakhstan, "Education Act" of the Republic of Kazakhstan. Environmental Code of the Republic of Kazakhstan determines active citizenship instilment regarding conservation of nature and respect for natural resources as one of the priority tasks of education in educational institutions, including schools. The State Program for Education Development for 2011-2020 in the Republic of Kazakhstan provides further strengthening of the environmental training of students and updating of supplementary education content.

Solution of the task of children and teenagers ecological awareness is significant both for global community as a whole and for each country in particular. In the course of developing it, the understanding of human behavior determination methods is crucial. The Science courses are the main channel of students' ecological concepts developing at Secondary school. School Geography course being at the junction of natural and social sciences, has a powerful educational resource for of students' ecological awareness formation. The task of adolescents' ecological consciousness formation can be successfully solved by the ecologization of Geography course. Reliance on personal cultural approach to the educational process organization and student-centered education technology while developing and implementing a set of additional teaching materials of pro-ecological orientation of Geography course has proven its effectiveness.

Relying on existing studies, early teenagers characteristics, personal and culturological approach to the organization of educational process and technology of student-centered education and on the basis of the state program, authors developed a set of additional teaching materials of pro-ecological orientation for learners studying Geography course in the 6th grade.

For the purpose of students' ecological awareness developing in 2014-2015 academic year a research was conducted on the basis of secondary school. The structure of experimental research can be divided into four stages: initial diagnosis, formative experiment, final diagnosis, analysis of the results. At the first stage environmental knowledge of students, their emotional attitude to environmental phenomena and motivation of ecologically relevant behavior implementation were assessed. At the second stage appropriate goals and objectives of the research methods and techniques involved in learning process were selected. The results formed the basis for developing a set of additional pro-ecological oriented teaching materials for Geography course studied by the 6th grade students. At the third stage a projective questionnaire diagnostic technique was developed and implemented. Results of teaching experiment were analyzed at the fourth stage. The analysis suggests that the developed set of additional teaching materials of pro-ecological orientation for Geography course for the 6th grade students contributes to the ecologization of Geography course and early teenagers' ecological awareness development.

The task of early teenagers' ecological awareness at Geography lessons in the 6th grade can be successfully solved by the ecologization of Geography course. Applying personalcultural approach to the educational process organization and student-centered education technology while developing and implementing a set of additional teaching materials of proecological orientation of Geography course has proven its effectiveness in the experimental research.