

Formation of Ecological Consciousness of Students on the Basis of Reflective Technologies

Sh. I. Bulueva^{1*}, S. A. Israilova², and M. A. Magomedova³

¹Kadyrov Chechen State University, Sheripova Street, 32, 364024, Grozny, Russia

²Chechen State Pedagogical University, Subra Kishieva str., 33, 364068, Grozny, Russia

³Dagestan State Pedagogical University, Yaragsky Street, 57, 367003, Makhachkala, Russia

Abstract. The article studies the process of formation of students' ecological consciousness on the basis of reflective technologies. The content of the concepts of "reflection" and "nvironmental consciousness" is clarified and concretized. The main theoretical approaches to the formation of ecological consciousness of university students are revealed. The views of domestic and foreign teachers on the problem of using reflective technologies in the process of forming the ecological consciousness of a person are analyzed. Reflection is considered as one of the main components of creativity, as a result of which the student becomes the object of creative action for himself. On the basis of reflection, his self-development, the formation of his life path and the development of his consciousness take place. Based on this, when working with students with a low level of reflection, it is necessary to apply tasks based on co-creative reflective technologies of an ecological orientation, which will lead to an increase in the level of reflection and environmental awareness.

1 Introduction

In modern society, there is a constant improvement of the socio-economic sphere, which in turn leads to the introduction into everyday life of a person, both in Russia and abroad, of modern achievements in the field of science and technology, which, among other things, should improve the environmental situation on planet Earth. But, despite these transformations, the ecological crisis continues to worsen, the basis of which is laid in the technocratic and anthropocentric way of thinking, which has been formed over the past centuries in the minds of mankind. As a result, all this led to a consumer attitude on the part of society in relation to nature, which in turn contributed to an increase in the number of man-made disasters in the world, constant wars, the market nature of the economy and other factors.

According to many researchers (N.I. Moiseev, S.N. Glazachev, B.T. Likhachev, S.V. Alekseev, N.N. Mamedov, I.D. Zverev, I.T. Suravegina, L.V. Tarasov, A.D. Ursul, etc.),

*Corresponding author: sovdat@list.ru

one of the main ways to transform relations in the “society-nature” system is the formation of a new paradigm in ecological culture and human consciousness, based on sustainable development and the ecocentric orientation of modern education.

Under these conditions, special attention should be paid to the transformation and improvement of the effectiveness of the scientific-theoretical and psychological-pedagogical content of environmental education in higher educational institutions, aimed at the formation of environmental awareness of students.

Consideration of a rather complex problem of the development of the ecological consciousness of the individual by means of environmental education acquires special significance in the modern conditions of the development of society.

At present, the solution of issues related to the development of the ecological consciousness of the individual, based on a qualitatively implemented environmental education, is of particular importance. Many researchers, such as A.A. Aldasheva, E. Girusov, A.V. Gagarin, S.D. Deryabo, A.N. Kamnev, D.N. Kavtaradze, B.G. Likhachev, V.I. Medvedev, V.A. Yasvin and others.

Despite the relevance of the problem of creating an integral system for the formation and development of the environmental consciousness of university students, this problem remains unresolved today. Many aspects of the development of environmental consciousness are not reflected in the educational process of the university. Recently, reflective technologies have become popular in higher education.

Many researchers, such as N.G. Alekseev, O.S. Anisimov, V.G. Anikina, M.E. Botsmanova, I.A. Vasiliev, I.M. Voitik, N.I. Gutkina, V.V. Davydov, A.Z. Zak, A.V. Zakharova, Yu.N. Kulyutkin, V.E. Lepsky, V.A. Lefevre, Yu.M. Orlov, L.A. Petrovskaya, E.B. Petrushikhina, T.Ya. Reshetova, I.A. Savenkova, I.N. Semenov, V.I. Slobodchikov, S.Yu. Stepanov, D.V. Ushakov and others.

2 Research Methodology

The main method used in this research work is the analysis of scientific and pedagogical literature. Based on the analysis of scientific and methodological literature on the research problem, it can be noted that the development of reflection contributes to the formation of the environmental consciousness of university students.

3 Results and Discussions

To understand the essence of environmental consciousness, without which it is impossible to solve the problems of this study, it is advisable to consider and streamline its definitions available in scientific publications.

OH. Gimazetdinova and N.M. Solodukho in the definition of “ecological consciousness” includes such a concept as eco-social being, which is the subject of this form of consciousness, and understand it as a special form of projection onto the surrounding reality [1].

Ecological consciousness is considered by A.L. Krainov, as one of the components of the consciousness of the individual, relating to the space in which a person lives, managing his activities aimed at preserving and improving the surrounding socio-natural environment, as well as overcoming environmental problems. The researcher notes that ecological activity is determined by human consciousness, by reflection in relation to the surrounding nature and includes several types: conscious or spontaneous positive interaction with nature; conscious or spontaneous negative interaction with nature [2]. For our study, the author’s opinion regarding the formation and development of the ecological consciousness

of the individual is important, which, as the scientist notes, is based on environmentally friendly upbringing, education and control.

Such a researcher as M.V. Rybakova considers ecological consciousness as the basis of a person's ecological ideas, based on the subjectivization of the "personality-nature" relationship, based on the features of interaction with the outside world that he has mastered [3].

Ecological consciousness in the studies of E.A. Antonov and I.B. Kostina is positioned as a complex, multifaceted phenomenon based on the knowledge, sensual and volitional sphere of human activity, as well as a set of mindsets that affect the final activity of the individual [4].

N.F. Reimers understand ecological consciousness as multidimensional and correlative, i.e. parametrically open and self-regulating system [5].

Of interest to our study is the work of S.D. Deryabo and V.A. Yasvin, in which "ecological consciousness" is considered as the basis for individual and group understanding of the relationship in the "man-nature-society" system and the surrounding socio-natural environment, the features of creating and applying strategies and technologies for nature-friendly activities [6].

The above scientists believe that ecological consciousness does not lead to a simplification of the totality of scientific knowledge and ideas that an individual has, i.e. only a reduction to ideas about the system of norms and rules of environmental protection and is not limited to the cognitive aspect. In the process of formation of ecological consciousness, the emphasis should be placed on the personal perception of the natural environment, which can be implemented on the basis of reflexive activity.

It should also be noted that ecological consciousness has an impact not only on the person himself, but also indirectly through him and on the natural environment. This happens on the basis of the development and rethinking of the political, economic, ethical, legal, pragmatic cognitive and aesthetic relations of the individual to the world around him.

Since the emergence of the idea of "sustainable development", which has taken root in the minds of the inhabitants thanks to the UN, one of the main ways of its implementation, according to L.G. Egorova, P.O. Ermolaeva and E.P. Noskova, is the formation of the ecological consciousness of the individual. These authors identify two approaches that contribute to the solution of this idea [7]:

1. A supporter of the first approach is Yu. Yakovets, who notes in his works that the solution to this problem lies in the promotion and further improvement of the ideas of the technological development of society, which in turn will lead to the emergence of environmentally oriented innovative technologies and, as a result, an improvement in the environmental situation on planet Earth;

2. Representatives of the second approach (N. Mosieevy O. Yanitsky) believe that, first of all, it is necessary to rebuild the consciousness of man and society as a whole on the basis of environmentalism as an ideological and paradigmatic component more essential than humanity.

Analyzing today's reality, it should be noted that there is a combination of these approaches, which is due to the fact that it is impossible to improve the ecological situation only by focusing on a technical breakthrough or re-education (changing consciousness) of the younger generation, only by combining ideas can we save the nature around us. With a high probability, it can be noted that a person with a high level of development of environmental consciousness in their activities is focused on innovation in the field of environmentally oriented activities, the creation and use of new technologies. Accordingly, for the sustainable existence of mankind, it is necessary to form and develop the ecological consciousness of the individual. Without observing this condition, it is impossible to

overcome the current environmental crises, not only in Russia, but also on the planet Earth as a whole.

Based on the analysis of psychological and pedagogical literature on the problem of research, the ecological consciousness that we plan to form among university students can be divided into two types: anthropocentric and ecocentric. Anthropocentric consciousness is characterized by the opposition of the interests of mankind to the interests of nature and the comprehensive use of natural resources and objects, without studying and predicting the consequences for the environment. Thus, this type of consciousness can be considered as a manifestation of a negative, consumer attitude towards nature itself and its objects. If we characterize the ecocentric type of ecological consciousness, then it is characterized by a close relationship with the natural environment and reflection in relation to predicting the consequences of one's actions. In this case, we can consider the ecocentric type of consciousness as the type to which one should strive in the process of development and formation of students' ecological consciousness.

The period that a student is given to study at a university does not always go smoothly. A similar position is held by T.Yu. Skamyanova, who notes that the student finds himself in new conditions for him, he needs to overcome both physical and social obstacles, learn a large amount of information unfamiliar to him, and much more [8].

We share the position of E.A. Alexandrova, who writes that today a new paradigm of modern higher education is being formed, based on the idea of developing the student's personality, which should be distinguished by mobility and success in the rapidly changing conditions of modern reality [9]. This, in turn, leads to a change and the emergence of new forms of educational and cognitive activity of students. Of particular importance in the educational process of the university is the mastery of the skills and abilities of self-regulation and reflection. We can see these skills as part of the competencies prescribed in the Federal State Educational Standards for most areas of training in higher education. Nevertheless, it should be noted the lack of knowledge among teachers in the field of the use of reflective technologies in the educational process of the university.

In order for a student in our time to be successful, competitive and competent in various areas of professional activity, he needs to carry out activities that are reflexive in nature. Thanks to reflection, a person understands his behavior and activities in the conditions of modern society, realizes the accumulated experience and his consciousness, which in turn contributes to its growth and development. The assimilation of new knowledge by students, as well as new ways of activity, cannot be imagined without the development of reflective skills, which are the basis for the formation of reflection. The greatest leap in the development of these skills and abilities occurs during the period of a person's education at a university, but it is necessary to begin to form them at school, when personal and professional qualities are being formed.

Reflection, according to G.P. Shchedrovitsky, can be represented as a process and a special structure in activity, understanding it as a mechanism and pattern of "the natural development of the activity itself" [10].

Reflection allows you to explain the specifics of human forms of being. So, for example, S.L. Rubinstein associated with it a special way of human existence and his attitude to the world. She, in his opinion, as if suspends, interrupts the continuous process of life and takes a person mentally beyond its limits. From this moment, according to the scientist, every human act acquires the character of a philosophical judgment about life. The author emphasized that "the emergence of consciousness is associated with the separation from life and direct experience of reflection on the world around and on oneself" [11].

The theoretical role of reflection in mental development was considered by L.S. Vygotsky, who believes that “new types of connections and correlations of functions assume as their basis reflection, reflection of one’s own processes in consciousness” [12].

In the work of V.I. Slobodchikov and A.V. Shuvalov, the term “reflection” is considered as the main activity of the individual, and such a concept as areflexia is an indicator of a violation of the psychological well-being of a person [13].

In the 80s of the last century, directions related to the humanitarian and cultural orientation began to appear in the studies of reflection. In the works of S.Yu. Stepanova and I.N. Semenov noted the importance of the reflexive aspect of thinking as a general condition conducive to the implementation of human mental activity (53, p. 32). We share this point of view regarding reflection as a necessary link in understanding and transforming the content of consciousness, as well as forms of activity and communication.

S.Yu. Stepanov and I.N. Semenov betrayed the mutual influence of the processes of reflection and the creativity of students and, based on this position, noted the importance of developing creative tasks [14]. Thanks to these studies, a direction of reflexive-humanistic psychology appeared, in which the process of personality creativity, based on a reflexive-innovative process, was studied.

In our study, we will rely on the concept of reflection as the main structural component and “mechanism” of creativity, proposed by Ya.A. Ponomarev, I.N. Semenov and S.Yu. Stepanov. These scientists understand reflection as one of the main components of the creative process, as a result of which the student becomes the object of creative action for himself. On the basis of reflection, his self-development and the formation of his life path take place. So, for example, S.Yu. Stepanov, who, drawing attention to the importance of domestic concrete experimental works devoted to the study of reflection, notes that reflection must be studied on the basis of the following grounds: the spiritual and life activity of a person, cultural and life experience [15].

In modern psychological and pedagogical research, reflection is considered not only as a process due to which the mental development of an individual takes place, but also as a basis for obtaining and assimilating new knowledge in various subjects and areas of training. Knowledge of the concept of “reflection” helps to a more detailed understanding of the processes of theoretical and abstract thinking, as well as the formation of the features of reflective control and evaluation.

Based on the works of G.V. Akopova, V.P. Zinchenko, V.V. Ponomareva, V.G. Ryndak, E.L. Ryazanova, I.N. Semenova, V.I. Slobodchikov and S.Yu. Stepanov, it should be noted that the process of reflection is based on the relationship with human consciousness. Based on the analysis of the above authors, the following types of reflection can be distinguished:

1. According to the level of development - elementary, scientific and philosophical;
2. By functionality in the implementation of activities - personal (situational, retrospective, prospective) and intellectual (extensive, intensive, constructive);
3. By the quality of the analysis of the action - formal and meaningful.

After analyzing the works of A.V. Karpova, N.B. Kovaleva, V.A. Lektorsky, V.V. Mariko, I.M. Shvets, E.I. Mishina, A.P. Ogurtsova, S.Yu. Stepanova, G.P. Shchedrovitsky, Gokce Elif Baykal, Maarten Van Mechelen, Marie-Louise Wagner, Eva Eriksson and others, the following types of reflection can be distinguished: 1) intellectual, 2) personal, 3) communicative, 4) cooperative.

ON THE. Zhukova in the study highlights reflection as a way that helps students learn ZUNs, form values, evaluate the results of their educational activities, and also outline an individual educational path [16].

A similar position is held by Ya.A. Ponomarev, I.N. Semenov and S.Yu. Stepanov, who write that the educational environment is an open non-equilibrium self-referential system,

which includes inter- and intrasubjective relations, spiritual, social and economic relations, culture, science. According to these authors, such an environment is based on both self-observation, i.e. reflection and self-report, and on self-organization and self-development.

As a mechanism for the formation and development of the educational environment of co-creation, Ya.A. Ponomarev, I.N. Semenov and S.Yu. Stepanov distinguish multi-level, specially scripted co-creative events, among which special importance is attached to joint activities of teachers and students.

Transferring the ideas identified by Ya.A. Ponomarev, I.N. Semenov and S.Yu. Stepanov on our research, it should be noted that the educational environment penetrates not only the student group or the educational organization as a whole, but also the higher education system, the student's family, and all social institutions of the state. It contributes to the formation and development of the conscious and subconscious behavior of the student in his rational-intellectual, intuitive value-worldview component, which can also include environmental consciousness.

Summing up the above, it should be noted that in the educational process for students, an important aspect for the development of reflexive skills is their motivation and regulation. It is thanks to the co-creative educational environment created at the university that the accumulation of positive emotional experience in the student and teacher in the field of the formation of environmental consciousness takes place, which in turn leads to the formation of their psychological protection from the impact of negative factors. As a result, the development of reflexive skills in educational activities of students takes place, i.e. improvement of adequate reflective ideas about themselves, an increase in the level of interpersonal interaction and the emergence of opportunities for solving problematic creative situations in new, non-standard ways. It is possible to form an ecological culture and consciousness of university students using environmentally oriented tasks, incl. creative tasks based on co-creative reflective technologies, on subjects that are specialized for a particular area of training, both in technical and humanitarian universities.

Based on the analysis of the works of N.B. Kovaleva, V.A. Lektorsky, V.V. Mariko, I.M. Shvets, E.I. Mishina, A.P. Ogurtsova, S.Yu. Stepanova, G.P. Shchedrovitsky and others, the following main forms of reflexive interaction between the teacher and the student in the educational process of the university can be distinguished:

- verbal (oral);
- written (graphic);
- pictorial;
- emotional and sensual;
- plastic (motor).

The written or so-called graphic form of reflection is based on the fact that students, after a lesson with them, write an analytical essay or essay in which they reveal their attitude to ecology, their ideas about environmentally friendly activities.

The pictorial form of reflection includes various kinds of drawings, diagrams, graphs, etc. Students try to express their attitude to environmental issues that were raised in classes in various disciplines using colors, shapes and graphics.

The emotionally sensitive form of reflection is based on the feelings and emotions that students express in the process of studying various subjects. These feelings and emotions allow the teacher to make assumptions about the ongoing environmental education interaction aimed at the formation of the student's environmental consciousness. This form of reflection can be combined with the forms of reflexive interaction described above.

The plastic or motor form of reflection includes certain movements that students perform. The movements made by students can be made both voluntarily and be specially set by teachers (for example, clapping on environmentally oriented material that is

accessible to the student, or the student remains motionless if the material or topic remains incomprehensible, not interesting).

One of the leading forms of reflective activity of students in the process of formation of their ecological consciousness is verbal or oral. This type of activity is based on a reflexive statement, which, according to S.S. Kashlev, consists of 3 parts [17]:

1. The first part. After the lesson conducted by the teacher, the student speaks about the state of his development of environmental consciousness.

2. The second part. The student speaks and reflects on the reasons for this level of development of environmental consciousness.

3. The third part. Conclusion, in which the student makes a detailed analysis of the interaction that took place for the lesson, i.e. analyzes the effectiveness of interaction with the teacher, other students, with their own experience of environmentally friendly activities, as well as raising or lowering their level of environmental awareness.

In the study, we will rely on the reflexive methods proposed by S.Yu. Stepanov and E.Z. Kremer for the formation of a co-creative reflective environment of an educational organization [18]:

1. Context methods. Based on the change, expansion, reconstruction and deconstruction of contexts, including cultural ones;

2. Positional methods. In their structure lies a change of point of view based on positional analysis, reconstruction and immersion in activity, social and communicative positions, the creation of a picture of what is happening from a position that is significantly different from the one that the subject occupies.

3. Functional and organizational methods. There is a development of new functions or the disclosure of new possibilities of previously known methods of activity, when solving non-standard tasks or in uncertain conditions.

4. Cultural and symbolic methods. They rely on changing the representation system (verbal, mathematical, schematic) and symbolic media (text to auditory or visual), as well as its decoding and recoding.

It is important to note that the interaction of the teacher and the student in the process of forming a co-creative reflective environment occurs not only in the horizontal plane - unilinearly, but is a multi-level process. The emergence of the process of interaction initially occurs on the basis of the professional position of the teacher. But due to the fact that the student strives for personal communication, it is necessary to develop the teacher's interest in relation to him. The action of a student in an educational situation is determined by the position that he occupies in an educational organization, as well as his individual characteristics. At the same time, the child's role-playing behavior may meet with the personal expectation of the teacher. Thanks to the teacher's professional reflection, personality-role contradictions can be overcome by him, which is an important condition for the development of the co-creative process.

As a result, the co-creative pedagogical process is based not on the roles that are inherent in the participants in this process, but on the interaction of the personalities of the teacher and the student. At the same time, role-playing interaction also occurs, the tension just goes away and a natural organized process of joint work is formed. Carrying out the formation of a co-creative reflective environment requires a considerable personal effort from the teacher, as well as constant self-improvement. At the same time, the formation of a co-creative reflexive environment in the process of forming the ecological consciousness of students can unfold in a variety of directions.

4 Conclusions

To date, the environmental consciousness formed by students can be divided into two main types: anthropocentric and ecocentric.

Thanks to the co-creative educational environment created at the university, students and teachers accumulate positive emotional experience in the formation of environmental consciousness, which in turn leads to the formation of their psychological protection from the impact of negative factors.

The interaction of the student and the teacher in the process of formation of environmental consciousness should take place in different modes of reflexive psychological and pedagogical support: individual (class analysis, consultations), group (seminars, trainings, projects), and collective (conferences, educational events).

Summing up the above, it should be noted that the interaction of the student and the teacher in the process of formation of ecological consciousness should take place in different modes of reflective psychological and pedagogical support: individual (class analysis, consultations), group (seminars, trainings, projects), as well as collective (conferences, educational events). It should be noted that in the process of formation of ecological consciousness, this interaction should be comprehended retrospectively, situationally and prospectively by both the teacher and the student.

References

1. A. Kh. Gimazetdinova, N. M. Solodukho, Ecological consciousness and ecological archetype: monograph, 140 (2008).
2. A. L. Krainov, Ecological consciousness: essence and socio-historical phenomena: diss, 145 (2001).
3. M. V. Rybakova, *Ecological culture as one of the factors in the formation of sustainable development*, 379-385 (2003).
4. E. A. Antonov, I. B. Kostina, Integration of the value and worldview foundations of postclassical environmental education, **14(1)**, 197-205 (2016).
5. N. F. Reimers, Ecology (theory, laws, rules, principles, hypotheses), 361(1994).
6. S. D. Deryabo, V. A. Yasvin, *Ecological pedagogy and psychology*, 480 (1996).
7. L. G. Egorova, P. O. Ermolaeva, E. P. Noskova, Dynamics of the ecological consciousness of citizens (on the example of Kazan), 6, 23-33 (2013).
8. T. Yu. Skamyanova, Adaptation of first-year students with special educational needs to study at a university as a pedagogical problem, **1(33)**, 37-44 (2019).
9. E. A. Aleksandrova, Humanization of the educational space: results of the international scientific conference, **1(21)**, 269-274 (2017).
10. G. P. Shchedrovitsky, *Reflection*, 800 (1995).
11. S. L. Rubinstein, *Fundamentals of general psychology*, 718 (2015).
12. L. S. Vygotsky, *Thinking and speech*, 352 (2016).
13. V. I. Slobodchikov, A. V. Shuvalov, Anthropological approach to solving the problem of psychological health of children, 4, 91-105 (2001).
14. S. Yu. Stepanov, The problem of forming types of reflection in solving creative problems, 1, 99-104 (1982).
15. S. Yu. Stepanov, I. V. Ryabova, T. A. Sobolevskaya, Psychological-pedagogical and somatic variables in the activity of modern school: effects of ring determination: monograph, 292 (2017).

16. N. A. Zhukova, Techniques for the development of reflection in the professional and methodological training of university students, **10(53)**, 87-92 (2020).
17. C. C. Kashlev, Organization of reflexive activity of participants in the process of environmental education, 1, 105-115 (2011).
18. S. Yu. Stepanov, Psychology of reflection: problems and research, 3, 31-40 (1985).