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ISSUES IN THE FORMATION OF STUDENTS' ECOLOGICAL VALUES IN THE PROCESS OF TEACHING BIOLOGY

Environmental education plays a decisive role in forming a system of ecological values that regulate the interaction between humans, the environment, and society. The article examines the hierarchy of ecological values and their transformation, as well as the relevance of universal human values in contemporary society. It emphasizes that fostering value development among students requires the integration of innovations into the educational process. Such innovations may be connected to meeting societal needs and promoting students' self-realization. Fundamental ecological values, such as "life as the highest value," "nature as a universal value," "the value of health and a healthy lifestyle," and "the value of biodiversity," among others, are imparted to students in biology classes.The strategic directions of state policy aimed at ensuring sustainable development and improving science education underpin the development of methodological approaches to forming ecological values during biology instruction. The concept of global environmental education and the priorities of socio-economic, humanitarian, and scientific development of society are closely related to this process.Scientific and methodological research in biology education pays special attention to the formation of ecological culture, the development of an emotional and value-based attitude toward nature, the establishment of ecological guidelines, and the scientific and methodological justification of these processes.The article presents the results of a study on school teachers' opinions regarding the formation of ecological values in biology teaching. The survey included 79 teachers, who indicated that senior classes in general education schools face challenges in defining and fostering ecological principles.

Keywords: value, ecological values, "man-society-biosphere", educational process.

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Биология пәнін оқыту үдерісінде оқушылардың экологиялық құндылықтарын қалыптастырудың өзекті мәселелері

Экологиялық білім беру адам мен қоршаған орта, қоғам арасындағы өзара әрекетті реттейтін экологиялық құндылықтар жүйесін қалыптастыруда шешуші мәнге ие. Мақалада экологиялық құндылықтардың иерархиясы және олардың өзгерісі, қазіргі қоғамдағы жалпыадамзаттық құндылықтардың өзектілігі қарастырылады. Оқушылардың құндылықтарын дамыту үшін білім беру үдерісіне инновацияларды енгізу қажеттігіне ерекше назар аударылады. Инновациялар қоғамның қажеттіліктерін қанағаттандырумен байланысты болып, оқушылардың өзін-өзі жүзеге асыруына ықпал етуі мүмкін. «Өмір – ең жоғары құндылық», «табиғат – әмбебап құндылық», «денсаулық пен салауатты өмір салтының құндылығы», «биологиялық алуандылықтың құндылығы» және басқа да негізгі экологиялық құндылықтар биология сабағында оқушыларға беріледі.Тұрақты даму мен жаратылыстану-ғылыми білім беруді жетілдіруге бағытталған мемлекеттік саясаттың стратегиялық бағыттары биологияны оқыту барысында экологиялық құндылықтарды қалыптастыруға арналған әдістемелік тәсілдердің негізін құрайды. Ғаламдық экологиялық білім беру идеясы және қоғамның әлеуметтік-экономикалық, гуманитарлық және жаратылыстану-ғылыми дамуының басымдықтары осы үдеріспен байланысты.Биология пәнін оқыту саласындағы ғылыми-әдістемелік зерттеулер экологиялық мәдениетті қалыптастыруға, табиғатқа деген эмоционалды-құндылықтық қатынасты дамытуға, экологиялық бағдарларды қалыптастыруға және осы процестердің ғылыми-әдістемелік негіздемесіне ерекше көңіл бөледі.

биология пәнін оқыту барысында экологиялық құндылықтарды қалыптастыруға қатысты мектеп мұғалімдерінің пікірін зерттеу нәтижелері ұсынылған. Сауалнамаға 79 мұғалім қатысты. Мұғалімдер жалпы орта білім беретін мектептердің жоғарғы сыныптарында экологиялық принциптерді анықтау және қалыптастыру кезінде кездесетін қиындықтардың бар екенін атап өтті.

Түйін сөздер: құндылық, экологиялық құндылықтар,» адам-қоғам-биосфера», білім беру процесі.

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Вопросы формирования экологических ценностей учащихся при обучении биологии

Экологическое образование имеет решающее значение для формирования системы экологических ценностей, которые регулируют взаимодействие человека с окружающим миром и обществом. В статье рассматриваются вопросы иерархии экологических ценностей и их изменения, актуальность общечеловеческих ценностей в современном обществе и образовании. Подчеркивается, что для развития ценностей у учащихся необходимо внести инновации в образовательный процесс. Инновации могут быть связаны с применением методов обучения, способствующих самореализации учащихся и удовлетворению потребностей общества. Фундаментальные экологические ценности, такие как «жизнь как высшая ценность», «природа как универсальная ценность», «ценность здоровья и здорового образа жизни», «ценность биологического разнообразия» и другие, передаются учащимся в школе при обучении биологии. Стратегические направления государственной политики, направленные на обеспечение устойчивого развития и улучшение естественно-научного образования, лежат в основе разработки методических подходов к формированию экологических ценностей в процессе изучения биологии. Идея глобального экологического образования и приоритеты социально-экономического, гуманитарного и естественно-научного развития общества связаны с этим процессом. Научно-методические исследования в области преподавания биологии уделяют особое внимание формированию экологической культуры, формированию эмоционально-ценностного отношения к природе, формированию экологических ориентиров и научно-методическому обоснованию этих процессов. В статье представлены результаты исследования о мнении учителей школ по формированию экологических ценностей при обучении биологии. В опросе приняло участие 79 учителей. Учителя считают, что в старших классах общеобразовательных школ имеются проблемы, с которыми сталкиваются учителя при определении и формировании экологических принципов.

Ключевые слова: ценность, экологические ценности, «человек – общество – биосфера», образовательный процесс.

Introduction

Deliberate human action is the exclusive method to prevent environmental problems, constituting one of the most urgent global challenges of our time. The laws of the Republic of Kazakhstan, notably the statutes "On Environmental Protection" and "On Natural and Man-Made Emergencies," illustrate the measures implemented to tackle environmental issues. Furthermore, governmental documents pertaining to environmental issues, such as the "National Environmental Action Plan for Sustainable Development," exemplify the nation's dedication to confronting ecological challenges. Environmental education and upbringing constitute the primary subjects of Section XII of the Law On Environmental Protection of the Republic of Kazakhstan (Articles 63–64). Additionally, the Concept of Environmental Safety in the Republic of Kazakhstan for 2004-2015, Section 4.3.1, emphasises that environmental education and raising are fundamental to the development of social cultural values. (Concept of Ensuring Environmental Safety in the Republic of Kazakhstan for 2004-2015, 2004). All publications endorsed by the State underscore the imperative of universal, ongoing environmental education and cultivation.

Ecological culture is understood as a system of knowledge, skills and value orientations that expresses and defines the nature of the relationship between man and nature, the measure and method of human involvement in the conservation and development of the natural environment (Ecological Code of the Republic of Kazakhstan, 2021).

The ecological crisis is a reflection of a cultural shift in how humanity interacts with nature and the

larger dynamics of human relationships, rather than being the result of individual mistakes in technological or social advancement. To address this issue, it is imperative to adopt new standards grounded in values, advocate for a more holistic ecological perspective, and change the focus from "economic efficiency" to "environmental efficiency." Establishing a comprehensive system of continuous environmental education and training that integrates cognitive, ethical, and practical learning elements while aligning with contemporary trends is essential.

Kazakh scientists Beisenova A. S. (1991) , Bigaliev A. B. (2000) and others have presented their works. The article is devoted to the definition of the main goals and positions related to environmental education and upbringing in schools and its further development in universities. In general, foreign scientists engaged in fundamental research in the field of environmental education: Sterling (2004), Clover (1995), Kent and Gilbertson (1997), and others, teachers V. L.Hall, D.Clover (1997), Fien (2001), note the significant role of environmental education in improving the ecological culture of the population and improving the state of the natural environment.

The development of basic concepts and ecological knowledge as part of general environmental education is the main emphasis of this study article, which focusses on environmental education and rearing within the natural sciences. It investigates the ways in which environmental issues are incorporated into specific courses, develops standards for choosing pertinent teaching resources, and looks at methodological and scientific approaches to incorporating environmental education into extracurricular activities.

And from an ecological and value point of view, education arose from ideas about the relationship of man with the natural environment, the progressive and regional nature of the relationship of society with the natural environment, the relationship of society with the natural environment. This, in turn, allows us to study it from a different angle (communicative, resource, social).

The study emphasises the importance of finding efficient methods for raising students' ecological awareness and integrating particular environmental value concepts into biology curriculum. To achieve this, educational materials must be expanded, improved, and organised to reflect the environmental ideals specified in core curricula.

The study's objective is to provide scientific evidence and build a framework for teaching biology in schools that helps students develop a system of environmental values.

Literature review

The global nature of the ecological issue has turned the formation of ecological values in the current education system into an important task. Raising students' environmental awareness and sense of responsibility is the foundation of sustainable development. From this perspective, understanding the theoretical foundations of forming ecological values enables the effective organization of the pedagogical process.

This review places particular emphasis on works in the fields of pedagogy, psychology, and ecology that address issues of ecological education and upbringing. Attention is also given to both Kazakhstani and international research. The literature reviewed has been published within the last 15 years, making it current and theoretically grounded.

The Meaning and Pedagogical Importance of Ecological Values

Ecological value is an internal orientation that forms a conscious and responsible attitude toward nature and motivates the protection of the environment. L.M. Ivanov and Z.A. Kozhakhmetova (2010) consider ecological values as a core component of personal development. According to them, a system of values defines students' behavior and life positions.

Theoretical Foundations and Concepts

- Value Theory (S.L. Rubinstein, M.M. Bakhtin) – Values are key factors that guide human behavior. Ecological values shape students' views of the world and nature.

- Pedagogy of Sustainable Development (D. Osborne, 2002) – Proposes a systematic approach to developing environmental awareness through education.

- Theories of Psychological Development (J. Piaget, L.S. Vygotsky) – Suggest effective methods for forming ecological values by considering the developmental stages of children and adolescents.

Prerequisites for Forming Students' Ecological Values

- Psychological Readiness: Shaping students' attitudes toward nature while considering their age-specific characteristics (K. Platonov, 2015).

- Social Environment: The ecological culture of the family, school, and society (N.V. Fedotova, 2017).

- Pedagogical Technologies: Developing values through games, projects, and hands-on activities (T.Zh. Baitassova, 2019).

- Material Base and Information Resources: Multimedia tools and practical lessons.

According to the reviewed literature, the formation of ecological values in students occurs at the intersection of several scientific disciplines and is a complex process. The interaction between pedagogy, psychology, and ecology is especially important from a theoretical standpoint. Research in this field focuses on identifying effective methods of ecological education and upbringing, considering students' individual characteristics, and the influence of social and material factors.

Materials and research methods

A combination of theoretical and empirical methodologies was utilised to attain the research aims. The study employed a range of theoretical and empirical methodologies. Theoretical techniques involved the analysis and synthesis of methodological, educational, didactic, sociological, psychological, and philosophical literature. It encompassed the use of prediction, modelling, and abstraction, alongside the comparison and generalisation of advancements in both Russian and international education. Empirical methods encompassed pedagogical experiments, questionnaires, surveys, interviews, the analysis of best practices in pedagogy, and systematic direct and indirect observations within educational environments.

Establishing a framework of environmental values necessitates a precise definition of the term across philosophy, sociology, and education. In the absence of this base, formulating an effective system for cultivating these values becomes challenging.

Understanding environmental values necessitates an examination of the interconnections among essential concepts such as "value," "value orientations," and "emotional-value attitudes towards nature." These concepts, grounded in philosophy, sociology, and psychology, demonstrate how values affect human behaviour and attitudes towards the environment, influencing behaviours and decision-making. The notion of "value" is essential throughout various fields, especially in education. It includes both concrete and abstract principles that establish societal norms and direct behaviour. In the social sciences, values significantly influence worldviews and ethical standards. Currently, environmental values are becoming more significant, shaping individuals' perceptions of nature and their obligations towards it. Education is crucial in fostering these beliefs, although approaches may vary among cultures. A comprehensive, interdisciplinary approach is crucial for understanding and fostering environmental values. This issue surpasses education, representing a broader societal challenge that requires a fundamental change in humanity's connection with nature.

The examination of values, value orientations, and perceptions of reality is a crucial component of value theory and continues to be a significant subject in contemporary philosophical discussions. The examination of human interaction and value systems has been a primary concern since antiquity. Socrates (about 470–399 BC) posed the fundamental inquiry of value theory: "What is good?" Philosophers such as Aristotle, Heraclitus, Democritus, Confucius, Lucretius, Plato, Protagoras, and Epicurus scrutinised values, investigating their influence on society and human spirituality. Nonetheless, their concepts were intricately linked to ontological investigations, as early philosophers sought to elucidate the nature of Being–whether through the Cosmos, Nature, or God–as the foundation for the universal notion of Good. This historical setting underscores the persistent significance of values in comprehending human cognition and behaviour. Throughout the Middle Ages, intellectuals such as Augustine, L.B. Alberti, L. Valla, Dante, Machiavelli, and Mirandola persistently explored moral principles within the realms of aesthetics, philosophy, and ethics. T. Campanella highlighted beauty as a spiritual value, L. Valla examined morality, and L.B. Alberti regarded beauty as an autonomous ideal. Nonetheless, as M.S. Kagan (1997) noted, "value" had not yet emerged as a separate philosophical notion. While early discussions of values contributed to modern ethical and aesthetic thought, they were often embedded in broader metaphysical inquiries, rather than treated as an independent field of study.

In philosophical discourse, "value" denotes the significance of various occurrences within human, social, and cultural contexts, reflecting whether an entity is regarded as positive or negative by individuals, groups, or society as a whole. Values serve as benchmarks for assessing importance, influencing ethical standards, norms, aspirations, and objectives. As individuals interact with these values, they create a personal hierarchy of priorities that influences their worldview and decision-making process. This personal value system influences behaviour and reflects the broader cultural and social context in which individuals reside. This hierarchy constitutes the normative, prescriptive, and evaluative aspects of consciousness. In an individual's psyche, interests and needs evolve from tangible cravings to abstract ideals, influencing one's worldview and directing behaviour. Values serve as both societal constructions and fundamental components of individual cognition. They connect material reality with

the domain of ideals, impacting both personal decisions and collective cultural evolution.

The notion of "value" embodies an individual's connection with the world, encompassing both intellectual engagement and emotional and experiential dimensions. M.S. Kagan (1997, p. 205) defines value, in its most expansive interpretation, as "the significance of an object for a subject." Psychologically, values manifest as value relationships, wherein an individual attributes meaning to an object. Thus, value is not an intrinsic characteristic of objects but arises from human engagement with the external environment. In international research, the examination of values is significantly shaped by Clyde Kluckhohn, who perceives them as organised principles that align and direct human cognition and conduct. According to Kluckhohn, values provide coherence to a range of impulses, assisting people in navigating the common issues of humanity. He makes a distinction between universal or society values and personal values, emphasising how both influence both individual and group behaviour. Values are recognised as intricate, multidimensional phenomena with a foundation in the study of mental processes in both domestic and international psychology research.Values are intricate constructions that embody an individual's views, goals, and worldview. An individual's alignment with specific values influences their value orientations, which then directs their behaviour, decisions, and general life approach. The values an individual possesses shape their worldview, interpersonal interactions, and decision-making, functioning as a guiding compass for their behaviours and attitudes. This viewpoint underscores the significance of values in comprehending human psychology and behaviour, as they are pivotal in determining our identity and guiding our life choices.

Numerous research on values differentiate between social and personal values. Social values are collectively held by larger groups or society, embodying common rules and priorities that direct group behaviour. Personal values are distinct to each individual, moulded by their experiences and beliefs, and they affect their decisions and perspective on the world. Social values establish a shared framework for groups, whereas personal values emphasise individual distinctiveness. Social values influence both communal and individual conduct, providing understanding of how individuals reconcile community expectations with personal convictions. Social values represent collective objectives, whereas personal values are uniquely expressed, influenced by individual experiences, cultural heritage, and personal beliefs. It is essential to acknowledge that individual values do not consistently correspond with prevailing cultural standards. Rather, they serve as a more personalised interpretation of overarching social standards. This process is influenced by several elements, including upbringing, life events, and external social dynamics, which will be examined in greater detail. This dichotomy underscores the intricacy of value development, as individuals negotiate the equilibrium between personal beliefs and cultural norms, influencing their perspectives and choices.

S.S. Bubnova's theoretical examination of classifications of fundamental value orientations (1998) identified three hierarchical levels within the value system and value orientations of an individual.

1. The most generalised and abstract values: spiritual, social, and material;

2. Values that are ingrained in life and expressed as personality traits;

3. The predominant modes of individual conduct as a mechanism for actualising and reinforcing value-properties.

The foreign researcher M. Rokich made a significant contribution to the advancement of value theory (2009, pp. 210-255). Key tenets of his theory include:

- a limited number of meaningful and driving values;
- the systematic organisation of all values.

The second position put forward by M. Rokich (2009) is especially important for us, as it determines the application of a systematic approach as a methodological basis for research. Expanding on this logic, it makes sense to pinpoint a set of principles that influence how people interact with and behave in regard to the environment; these principles are known as "environmental values." Although the phrase "environmental values" has been used in recent scientific publications, there are still few specialised works that examine this idea. To understand the concept of "environmental values", given its lack of elaboration in the psychological and pedagogical literature, it is necessary to turn to related fields of knowledge.

For example, the American philosopher Holmes Rolston III (1990) in his article "Does environmental ethics exist" offers the following definition: "Environmental ethics is ethics that addresses environmental problems". Thus, if we consider value orientations as "the orientation of a person towards certain values," then those that address environmental problems can be considered environmental values.

Environmental values are, in our opinion, a consequence of the reflection of global environmental problems in the consciousness of all mankind. The ecological crisis arises from a conflict within the "nature-society" system, where humanity's exploitation of natural resources clashes with the biosphere's limited capacity to sustain such activities. This imbalance highlights the tension between human progress and the Earth's ecological boundaries.

N.V. Gruzdev (2001) examines the notion of ecocentric consciousness, highlighting its importance in relation to humanity's transition towards environmental conservation. Gruzdev(2001) posits that the essential traits of ecocentric consciousness encompass the acknowledgement of harmonious growth between humanity and nature as the paramount value, with the natural world regarded as intrinsically valued. This perspective also dismisses a hierarchical worldview, promoting an approach where interactions with nature seek to satisfy human needs while ensuring the welfare of the entire natural community, substituting dominance with collaboration. Gruzdev emphasises that ecological interactions must adhere to a principle that allows only activities that preserve fundamental ecological equilibrium. In this context, nature and its components are considered whole subjects of interaction with people. According to this perspective, ethical rules are applicable both to human interactions and to humanity's relationship with the natural environment. Furthermore, the evolution of both nature and humanity is regarded as a coevolutionary process, with conservation initiatives motivated by the inherent value of nature rather than exclusively by human interests.

Notwithstanding comprehensive discussions, the incorporation of environmental values into biology education remains insufficiently advanced. A robust approach for integrating these values into school curricula is absent, and the scientific frameworks for structuring them remain inadequately developed. This disparity underscores an urgent necessity, as the social demand for environmentally aware persons is not being fulfilled by existing educational methodologies. Environmental education should extend beyond ecological facts to encompass ethical, social, and cultural components, in accordance with the broader notion of sustainable human development. This perspective perceives environmental concerns as interrelated with social, cultural, and economic elements, necessitating a comprehensive understanding of environmental values. For example, appreciating biodiversity or resource efficiency should motivate initiatives such as conservation or waste minimisation. A planned framework for incorporating environmental values into biology instruction is vital, bolstered by teacher training and multidisciplinary approaches. Educational institutions ought to offer practical applications, such as community initiatives, to enable students to recognise the consequences of their activities. By cultivating environmental principles, education can allow students to face 21st-century concerns and contribute to a sustainable future.

A. Galang and E. Krutz (1996) assert that environmental values are expressed through particular behaviours that promote sustainable coexistence with nature. They underscore the acknowledgement of humanity's profound interdependence with the natural environment, stressing the imperative of responsible resource management that amalgamates traditional wisdom with scientific methodologies. Moreover, they contend for the inherent value of all living organisms, claiming that biodiversity must be conserved irrespective of its direct usefulness to humanity.

A. Galang and E. Krutz(1996) emphasise the necessity of reducing environmental damage through sustainable practices, promoting the fair treatment of all species by recognising humanity's position as a steward rather than a dominator of nature. Furthermore, they emphasise the necessity of fulfilling essential human needs within ecological constraints, guaranteeing equitable access to resources. Their work underscores the responsibility to future generations, necessitating the sustainable use of resources and the minimisation of waste. Furthermore, they contend that essential human rights–such as freedom of thought, expression, and assembly–must be uniformly respected. Finally, they emphasise the importance of upholding democratic norms, promoting inclusive decision-making and access to education as vital elements of a sustainable future.

Similar to this, Y. Szagun and U. E. Mesenho (1991) propose a list of 10 "green values" that include "ecological wisdom," democracy, personal and social responsibility, nonviolence, decentralisation, a local community-focused economy, respect for diversity, global responsibility, and a forward-thinking mindset.

The examination of global research on environmental values reveals that many specialists fail to define a distinct set of values that reflect an individual's relationship with nature. This underscores our view that ecologically optimal human behaviour is influenced not just by specific ecological objectives but also by a broader spectrum of fundamental

values. Ecological values might be considered subsystems of universal values.

Thus, the most important feature of environmental values is their systemic connection with universal values.

According to the most general classification of values, they are divided into two main groups: objective values (phenomena of the material world) and subjective (spiritual) values. Objective values are directly incorporated into a person's life, become part of his humanized world, and thereby the world is not only known, but also experienced.

Environmental values can be divided into two categories: subject-related and subjective. Subject-related values focus on the physical environment, including natural resources, ecosystems, and human activities tied to environmental management, spanning from local to global scales. Subjective values, on the other hand, reflect societal ideals, traditions, customs, and rules shaped by historical contexts. These values inspire individuals and groups to strive for a more advanced civilization, driven by the need to meet the demands of their time. Together, these values highlight the interplay between tangible environmental elements and the cultural, historical, and ethical perspectives that guide human interaction with nature.

Value systems develop and transform over the course of societal history, with their significance reaching well beyond the era of the social groupings that created them. Values can be broadly classified into three primary categories. The initial category comprises universal human values, which function as ideals applicable to all individuals worldwide, regardless of time or location. These ideals encompass the globe and signify their fundamental importance for human existence.

Universal values are interrelated and surpass particular historical settings, rendering them timeless. They are integrated through various human activities and influence how individuals interact with the world. These values persist across time and civilisations, shaping individuals' behaviour and viewpoints. Social values refer to the norms, regulations, and behaviours that characterise a social community. These principles represent the group's collective consciousness and are associated with initiatives focused on the development and preservation of nature. Social values develop in tandem with society's evolving requirements and prioritise the welfare of both the community and the environment. Personal values denote the distinct value systems possessed by individuals, influenced by their experiences, beliefs, and introspections. These values direct human activities and decisions, shaping how individuals engage with their social and natural environments. Universal and social values provide overarching frameworks, whereas personal values embody particular goals and viewpoints. The system of universal values develops in the process of progressive development of value systems and becomes a priority in the modern era.

An ecological value, in its content it bears the features inherent in any value as an expression of people's actively interested attitude to the phenomena of reality. "On the one hand, value is an objective or other real phenomenon of reality that is significant to the subject. On the other hand, value is the phenomenon of a subject's consciousness of what is significant in a certain situation."

K. Stoshkus (1987) elucidates the nuances of environmental values, asserting that they are influenced by the characteristics of the assessment subjects–natural objects, their intricacy, the diversity of their interconnections, and their distinctive interactions with other elements within the system, extending to the biosphere. The ubiquitous interconnection of nature compels one subject of environmental activity to engage with another subject. The particulars of value orientations are dictated by environmental requirements and the subject's interest in the optimal operation of natural systems.

The values of nature have their own characteristics and features inherent in every value, namely, the expression of a person's active attitude to the phenomena of the surrounding world, which determines the orientation of our research towards a personal-activity approach to learning.

The specificity of moral values is that they express the subject's interest in a special object. Ecological values function in the system of moral values, becoming the specific content of the latter. Moral and ecological values permeate many areas of human activity; ecological values function and make sense in the areas of direct and indirect interaction of the subject with the object of nature, while moral values permeate all relationships.

The interplay between environmental and ethical values defines the core of the demands and necessities stemming from the ecological context. Consequently, relationships with nature are encompassed within the realm of moral phenomena, such as conscience, responsibility, and home. This indicates that ecological relationships are concurrently, albeit from a different perspective, moral relationships.

Moral values form the core of value orientations, since there cannot be a person who is excluded from moral relations, whereas sometimes people can be indifferent in scientific, aesthetic and other respects.

S. Yanavicius (1987) tried to give a classification of environmental values. He builds a system of environmental values by correlating the specifics of the functioning of each value and their relationship to professional morality:

- ecological and scientific (meet the historically determined needs of society, the development of the biosphere);
- ecological and aesthetic;
- ecological and economic, which can be further divided into: ecological-agricultural, ecological-industrial, ecological-energy, etc.

Our examination of academic literature reveals that the internalisation of environmental values and perspectives amplifies individuals' recognition of nature's diverse worth and the indispensable nature of life. It enables individuals to make informed ethical decisions regarding their relationships with nature, fostering a feeling of environmental stewardship. This encompasses responsibility for environmental conditions, personal health, and the welfare of others.

Results and discussion

An examination of psychological, pedagogical, didactic, and methodological literature indicates that the content of biological and environmental education encompasses a value component, frequently evident in research concentrating on emotional and value-based perspectives towards nature or value orientations. Nonetheless, it is crucial to acknowledge that, despite the extensive body of research, environmental values are not regarded as a distinct component of the curriculum. Moreover, a thorough framework for cultivating environmental values within the Biology curriculum is absent. This conclusion is corroborated by a survey of 79 biology educators, which sought to investigate the obstacles faced by teachers in promoting environmental principles. The study aimed to investigate instructors' views on the significance of imparting environmental values to students in biology classes and to identify the challenges faced in integrating these values into senior-level biology education.

Table 1 – Results of a survey of biology teachers (in % of the number of respondents)*

In your opinion, what environmental values should be developed among schoolchildren?	
- life	*69%*
- the value of nature	*82%*
- the value of biological diversity	*46%*
- sustainability of life	*54%*
- health	*56%*
- biosphere	*23%*
- harmonious relationship between society and nature	*78%*
Do you consider it mandatory to form environmental values in biology lessons?	
- preferably	*86%*
«No,» I said.	*3%*
- taking into account the students' preparedness	*11%*
Who do you think plays the leading role in shaping the environmental values of a person?	
- to the teacher	*66%*
- parents	*53%*
- to the homeroom teacher	*65%*
- teachers of extracurricular institutions	*72%*
- mass media	*49%*
- self-formation	*7%*
Why, in your opinion, is it necessary to form environmental values?	
- knowledge expansion	*13%*
- formation of environmentally sound activities	*63%*
- formation of environmental beliefs	*42%*
- formation of a worldview	*54%*

*79 biology teachers from Almaty, Taldykorgan participated in the survey

An analysis of biology teachers' responses to the developed questionnaire (Table 1) allows us to conclude that 86% of respondents consider it desirable to form environmental values in the process of teaching general biology. Arguing that: this "contributes to the formation of a worldview" – 54%, "the formation of environmentally sound activities" – 63%, the formation of environmental beliefs – 42%. Thus, it is revealed that teachers are aware of the importance of forming environmental values in

the educational process. However, 75% of respondents believe that environmental values are insufficiently formed among school graduates. The survey participants believe that the leading role in the formation of environmental values belongs to the teacher (66%), the class teacher (65%), and 72% of respondents indicate the leading role of teachers of extracurricular institutions. The responses regarding the values that educators believe should be cultivated during the Biology course frequently highlighted essential values such as culture, life, nature, and spiritual values including kindness, honesty, and freedom, as well as moral values like humanism, citizenship, patriotism, and a harmonious relationship between society and nature.

Table 2 – Results of a survey of biology teachers (in % of the number of respondents)*

What difficulties do you personally encounter in shaping environmental values?	
- poor knowledge of students	*66%*
- insufficient skills	*56%*
- lack of interest in the subject	*58%*
- the influence of the social environment	*41%*
- heavy workload of students	*4%*
- insufficient upbringing	*38%*
At what level are environmental values formed among school graduates?	
- in the full scope of the school curriculum	*10%*
- over the program	*2%*
- at an expanded level in connection with the interests of the individual	*5%*
- at an expanded level in connection with participation in practical activities	*8%*
- to an insufficient extent	*75%*
What are the reasons that make it difficult to form environmental values in biology lessons?	
- insufficient study time in training programs	*13%*
- lack of a value formation system in extracurricular activities	*21%*
- organizational difficulties in practical and extracurricular activities	*11%*
- lack of a scientifically based methodology for value formation	*65%*
- lack of a system of environmental values in relation to the standard of education	*43%*

**Since the survey participants could specify several positions, the total is not 100%

To comprehend the obstacles encountered by biology educators in imparting environmental values to 10th-grade pupils, we solicited their identification of the challenges they individually confront in this domain. The findings indicated that 66% of participants ascribed the problem to students' inadequate knowledge, 56% identified a deficiency in pertinent abilities, and 58% cited a lack of enthusiasm in the subject matter. Moreover, 38% identified insufficient schooling as a contributing factor. Further analysis of the responses indicated that the teachers identified the primary causes of the problem as follows: Sixty-five percent of respondents emphasised the lack of a scientifically based technique for imparting environmental values, while forty-three percent noted the absence of a systematic framework of environmental values consistent with educational requirements.

Thus, studying the practice of teaching biology has shown that teachers understand the importance of focusing biology education on the assimilation of universal and environmental values. The identified difficulties served as the basis for the development and scientific substantiation of a methodology for the formation of environmental values of students during the study of the Biology course. Research into the development of ecological values within school biology education has highlighted a significant contradiction: while biology teachers require a comprehensive methodology for fostering ecological values, such a framework is largely absent in both the theory and practice of biology instruction. A review of literature related to this issue has revealed ongoing challenges in pedagogical science across various stages of its evolution. Specifically, in the context of our study, a contradiction has been identified between society's pressing need to cultivate ecological values in individuals and the inadequate integration of this objective into biology teaching methodologies. Additionally, there is a disconnect between the inclusion of a value-based component in biological and ecological education and the lack of a structured, hierarchical system of ecological values within the school biology curriculum. Summing up, it is necessary to emphasize that the processes of transformation in society, the reform of the education system in Kazakhstan, and the deepening of the global environmental crisis have led to the formation of a moral, spiritual, emotional, and value-based attitude of man to nature in biological and environmental education. The ecological culture of a personality is considered by scientists as

the goal and result of biological and environmental education, since culture acts as a regulator of human-nature relations. Based on the above, the primary responsibility of schools in the current stage of societal development is to provide students not only with systematic knowledge about nature, humanity's place and role in the world, but also to foster a system of ecological values as the foundation for an ecological worldview and ecological culture.

Conclusion

Thus, the analysis indicates that environmental values are integrated into the framework of universal human values and are closely associated with general biological, fundamental, spiritual, and moral values. Consequently, the value system of the General Biology course should incorporate them as essential components. Nature holds universal significance, functioning as a universal value, as well as a biological, cognitive, aesthetic, and material value. The ecological values encompass the unity and integrity of nature, the natural environment, biological diversity, and the sustainability of the biosphere.

Modern classifications and systems of ecological values reveal a dissatisfaction with the current state of our ecological culture and quality of life, highlighting the need for a more elevated cultural perspective on natural entities. Environmental values, in their interaction with moral and universal values, are shaped by contemporary qualitative objectification, thereby constructively influencing ecological culture.

The study of various approaches to the classification of values allows us to draw the following conclusions, which are important for the implementation of our research:

1. Environmental values are elements of a person's need-motivation sphere that encourage an individual to engage in environmentally sound activities based on a certain attitude to nature, the environment as a whole, its individual aspects or objects.

2. Ecological values can also be considered as peculiar "models of due" (A.N.Leontiev), characterizing the individual image of the ideal state of human-society -nature relations.

3. It is necessary to consider environmental values and universal human values of the individual as a single system, the interrelation of the two elements of which regulates human behavior in relation to the environment.

Thus, the above analysis and generalization allows us to propose the following definition of the concept of "environmental values":

Ecological values are a fundamental component of the overarching framework of human values, signifying an individual's dedication to environmental sustainability and their comprehension of nature. These principles facilitate the cultivation of an optimal relationship within the interconnected framework of "human-society-nature" and are essential for promoting ecological culture. They are crucial in promoting ecologically responsible behaviours and tackling ecological issues. Based on research conducted by educators, psychologists, biologists, ecologists, and methodologists, as well as our own investigations, we contend that establishing scientific and methodological frameworks is essential for fostering environmental values in biology teaching. By integrating systematic, ecological, humanistic, and personal-activity approaches, we can create a robust methodology for cultivating these values effectively.

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