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The third issue contains articles by scientists from different countries, prepared on the basis of their scientific work. It is designed for university teachers, graduate students, undergraduates, practitioners in pedagogy and education management.

EDITORIAL TEAM

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CHAPTER 1
GENERAL PEDAGOGY AND HISTORY OF PEDAGOGY

THE CONCEPTS OF QUALITY AND ACCOUNTABILITY IN GENERAL AND HIGHER EDUCATION

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Abstract. This article presents three measures of educational quality and six types of accountability, noting that these terms are complex and often contradictory. These terms are often used uncritically, with the result that educational policies following from them are misconceived or simply drift. For educational policies to be sound, they must be based on a clear use of terms and on a sound understanding of desired objectives. These objectives are matters both of stakeholders' preferences and politics. The subjective and political nature of educational policies should be recognized, so that there can be formed an explicit basis for and consensus around appropriate educational objectives. The purpose of this article is to bring clarity to the common concepts of quality and accountability in education, so that educational policies may be better informed. The methodological basis of the research is the methods of comparative analysis of scientific research in the field of social and natural sciences, the authors of which investigated human, social and cultural capital. The educational establishments of all countries need from time to time to deeply re-examine certain operative concepts. In this regard, an informed consensus needs to be reached about the multidimensional and sometimes contradictory notions of quality and accountability. Habit and drift are not helpful to educational policy; instead, educational values and goals should be actively discussed and clarified in broad national discussions, comprising all major interested parties. A good educational system is ultimately a civic achievement, set within a community of informed and interested stakeholders.

Keywords: educational quality; educational accountability; welfare state; knowledge economy; educational market.

JEL Classification: B 10, I 18, L 88, O 31
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Introduction. The topics of educational quality and accountability are traditional, but also timelessly relevant. These topics are matters of particularly lively discussion in the present era, when most countries are concerned about their economic competitiveness. However, the terms quality and accountability are usually used loosely and mean different things to different people, with the result that public policies are often the result of false consensus or drift. Policies need to be based on explicit understanding of their premises. The intention of this article is to clarify the meanings of quality and accountability, thus setting parameters for productive policy discussion.

Literature review. Educational systems simultaneously pursue various objectives, and can be configured in many different ways, for different kinds of clientele having different kinds of values and purposes. The issues of quality and accountability cut across all educational objectives.

One prior issue for setting objectives in education is the basic one of identifying the kind of economy we live in. Peters [1] posits three forms of the new knowledge economy – for learning, creativity, and openness – and questions how an educational system can meet the requirements for this new economy. An additional question that comes up is which persons or institutions should decide on goals and policies (ownership) in education. The usual answer is that this is the prerogative of the state. Accordingly, Taylor [2] offers an extended discussion of the proper role of state educational institutions in response to new economic pressures, political and social relationships, and tensions among various institutional and social interests. The many possible roles of states and markets are also comprehensively addressed by Cohn and Geske [3].

Ideologists of market-oriented neo-liberalism are not prepared to concede a monopoly, or even primacy, to the state in educational policy, and argue for a larger role for the market in education. In this regard, Barrett [4] warns against the notion that individual students and their parents should be treated merely as customers of educational services, because customers are not always well informed about the nature of these services. This criticism of market models extends to schools; but schools are not rational market actors, and asking schools to act like private firms can lead to perverse outcomes, as described by Gidney [5].

Underlying such issues are the notion of what actually constitutes quality in education, as examined by Gray [6]; and what is implied by accountability, examined by Epstein [7] and Monk [8]. Obviously, educational policies are shaped around the definitions and purposes assigned by stakeholders to these terms.

Aims. The purpose of this article is to bring clarity to the common concepts of quality and accountability in education, so that educational policies may be better informed.

Methodology. The methodological basis of the research is the methods of comparative analysis of scientific research in the field of social and natural sciences, the authors of which investigated human, social and cultural capital.

Results. In our research, we will drive concept of education quality and accountability.

The concept of quality. Many countries throughout world are properly concerned over quality in education [9]. Those countries most infected by the neo-liberal "audit culture" are also concerned that educational institutions are somehow not accountable for their expenditure of limited resources on education [2]. Each country fears that it is falling behind because its educational system is underperforming for the money spent.

The term quality is freely but carelessly tossed about by politicians, business leaders, and public commentators. But what does this term actually mean? How is to be achieved in practice? Seemingly straightforward, quality is an elusive concept; and much harm can be done by public policies that are inadequately considered.

For example, quality can mean a certain *benchmark* of academic rigour and attainment; but, alternatively, it can mean the amount of academic *valued-added*. A quality educational system can also be said to be one that has a high retention and completion rate, a low retention and completion rate, provides equality of access and social justice, is selective in access, socializes for patriotism and citizenship, creates deference to authority, or stimulates creativity. Many of these indicators of quality are contradictory, and it is obvious that there can be no universal agreement about what quality is. And if policymakers cannot define quality, then how can they identify the factors that are supposed to produce the quality? These are not trivial questions, but go to the heart of stakeholder preferences, education systems design, and public policies.

In order to illustrate some basic dilemmas, we may note the author's experience at KIMEP University, Kazakhstan, with Advisory Board meetings of employers, alumni, and students at the Department of Public Administration and International Development [10]. Reflecting the broader cultural assumptions of society, employers report that they would like to receive graduates with stronger practical skills, and tend to undervalue theory and abstraction. It may be said that, for employers, practical skills are a "free good," and so employers could never have too many of these. However, when the topic shifts to the strong points of KIMEP graduates, employers much appreciate the independence, initiative, creativity, problem-solving abilities, as well as the communication and interpersonal skills of their new hires. These are the so-called "soft skills" or transferable skills, which are becoming increasingly important in the global learning economy [1], and which give KIMEP graduates an advantage on the employment market. In other words, public and market stakeholders do not necessarily understand their own interests; and their simplistic understanding of quality could harm their country. To its credit, KIMEP University has avoided the temptation of the vocationalism that many employers, parents, and students themselves would prefer.

One educational expert who struggled with the concept of quality is Gray [6]. He notes that educators usually try to judge quality against some kinds of standards; but this brings up the question of what are the proper standards themselves. Furthermore, can we devise tests for these standards that are conceptually clear, and whose results are valid? Can we devise tests and standards that are objective? In a word, "no," says Gray.

A problem with standard tests is that teachers will "teach to the test." Since teachers might already know what will be on the test if it is a national test, or have a good idea from past experience, they will concentrate on teaching just those things that will probably be on the test. The result is that students get good test scores and teachers get good ratings. For their part administrators can say that they are good administrators, because they hired good teachers who produced good students. Ministry of education officials record and legitimize this seemingly good performance. This is something like a public policy "racket" – everybody comes out looking good. In cases of bad outcomes, however defined or perceived, an entire "edubusiness industry" and cohorts of education consultants, psychologists, and fixers of various kinds stand ready to offer expensive but not necessarily useful services to worried parents and stakeholders [4].

Traditionally, Gray says, we think of standards as being either vocational or academic. Tests for vocational purposes are conceptually easier to devise. For example, can a hairdresser perform all the steps in her job – washing the hair, styling the hair, and cutting properly? Likewise, can a welder produce good welds in various shapes, that can withstand objective pressure-tests without breaking? In such cases the answers to test questions are simply "yes" or "no."

But tests for academic purposes are conceptually much more difficult to devise. Do we want to test basic reading, writing, and arithmetic skills? Social skills? Leadership skills? Do we want educational tests that measure maturity in some way, or well-roundedness in people? How can we test and reward for diligence, originality, and special talents? Educational policy specialists have never come up with definitive answers to these questions. Still, Gray suggests, we do not have to throw up our hands helplessly and say that to devise criteria for good-quality education is impossible; we do not want to say that everything is relative and that one educational system is just as good as another. Gray asserts that we *can* devise at least general standards based on observation and common sense.

Gray says further in this regard that simple quantitative tests of academic quality do not make sense. In his view, broad commonsense judgements of quality are the only ones that are meaningful. More specifically, he says that there are only two basic ways in which the quality of a school's performance can be judged. The first and easiest way is to compare this year's performance with the previous year, and the year before that. This method is based on the assumption that the intake of new students has remained much the same in the same school from one year to the next. The second approach for evaluating quality is to compare like-with-like. In other words, how much progress have the students in one school made compared with students in another school having similar kinds of students? Ideally, one would use both approaches at the same time.

Moving on, Gray addresses a major controversy among educators, namely "How much difference do schools make?" That is, to what extent can a good school improve the performance of poor students? And to what extent will the performance of good students decline in poor schools? Gray cites a number of Western studies

that indicate that typically about half of students' performance depends on the kind of school they are attending.

Gray finds three main factors which seem to make a difference in quality within a school:

1.   The first of these is the centrality of the institution's *values*. The more effective schools seem to know what they are about and where they are going. These schools have "visible and explicit ideologies" and clear mission statements that outline the schools' aims. One significant feature in this connection is that both the staff and the students can provide a reasonably good description of what is required for success and quality to be achieved.

2.   The second factor that distinguishes good schools from poor ones is that the good schools have a press for achievement. Teachers expect their students to achieve; and students in turn find themselves challenged and stretched in the classroom. That is, there is an *atmosphere* that emphasizes attainment.

3.   The third major factor that makes schools effective and of good quality is the *relationships* between students and teachers. There is an absence of conflict between students and teachers; and, beyond this, a more positive mutual respect or rapport. There are also many opportunities for students to establish stimulating and productive relationships with teachers, and each student has the opportunity to find at least one teacher for whom that teacher is special in some aspect related to learning. Put another way, when the student graduates she or he will remember at least one teacher in the institution who had a significant influence on her or his life.

To restate, the dimensions of quality listed above cannot be measured quantitatively and therefore do not lend themselves to managerial and top-down controls and pressures. Each of these quality criteria is based on common sense and observation. Very importantly, one notes that quality is achieved by the personnel directly involved – teachers, faculty, and students. There is not much place for oversight by a diverse and fragmented public (public choice) nor oversight by distant state bureaucrats (managerialism) who are unacquainted with specific classroom conditions and the pedagogical process.

It is thus no accident that publics and bureaucrats are not part of Gray's narrative. Gray assumes that the teaching community itself is the best custodian of education. It is also no accident that the educational systems rated the most highly in the OECD and other literature are in those countries in which the teaching and faculty professions tend to be unionized or have strong teacher and faculty associations, and which are able to articulate educational issues at first hand. The educational systems of these countries also tend to be highly decentralized. Some such countries are Finland [11], Sweden [12], and Canada [5].

Accountability. As with quality, it is proper for countries to have an ongoing concern for accountability. The term is often heard; but what kinds of accountability are there?, Epstein [7] asks. Usually the first thing we think about when we hear the word "accountability" is the proper and democratic accountability to the taxpayer. Since taxpayers – the general public – are paying for education and supporting it in other ways, they are entitled to see that their money is spent effectively on the uses

for which it was intended. But, says Epstein, accountability is a two-way street. The consumers or "clients" of education – parents and students – are also entitled to something; they are entitled to quality and social justice. So here we are speaking about accountability to the citizen. That is, the educational system should be designed in such a way that young people from all social categories should feel comfortable within it, and that this system should provide them with an equal opportunity in life. We should keep in mind that parents are taxpayers and students eventually will be taxpayers; therefore the distinction between taxpayers and citizens is not clear. Here we see the germ of a political conflict, for who decides on taxpayers' versus citizens' rights? In other words, to whom does education "belong" – to taxpayers or citizens, or does it belong to governments or business?

Epstein's basic argument is that governments often use the democratic-sounding term "accountability" in fundamentally undemocratic and therefore unaccountable ways. She says that most governments are disproportionately answerable to business interests, and therefore a hidden "business agenda" or business priorities (narrow vocationalism in employment and applied science in higher education) and not a civil rights agenda nor social priorities (in general education) are emphasized. Thus governments will make sure they spend enough money on the things that business wants: basic literacy and numeracy, sciences, computers, and manual skills such as typing and computer keyboarding. Governments and their business allies are also interested not only in what is taught, but also how things are taught; therefore they wish to promote things like discipline, obedience, and social conformity. What tends to be forgotten in the educational system, Epstein says further, is such things as education against racism, against religious prejudice and intolerance, and against discrimination against women or others. Forgotten is the functioning of society itself, and the development of social capital (trust and goodwill) in society [13].

Looking at the concept of accountability in more detail, Epstein lists six general kinds:

a. *Accountability to the market*. One of the major ways in which governments define accountability is with reference to the market. In principle, the market is supposed to empower consumers; that is, consumers have money, and so the market must satisfy them. But whenever there is the operation of markets, there is also the potential for social inequality and access to education that is sub-optimal for the national economy. However, governments usually do not do much to compensate citizens for inequalities created by educational and employment markets. The result is that the children of poor people, rural people, and ethnic minorities are often left behind.

b. *Accountability in school budgets*. In this connection, Epstein says, the so-called "market accountability" is allowed to operate at the level of the individual school or university. What has been happening in the USA and Britain is that the government provides a certain amount of base funding (say 60% or 80%), but then parents and local municipalities have to make up the rest, or else find sponsors in the business community. The problem here, of course, is that some municipalities are richer than others, or contain more industries and broader tax bases than others.

Through no fault of their own, children in poor municipalities fall behind; and *de facto* they are no longer equal citizens of the country because they no longer have equality of opportunity.

c. *Accountability as consumer choice.* An additional component of market accountability through which it has been tried to make schools accountable is the notion of consumer choice. The idea is that there should be open enrolment to schools. Instead of being required to send their children to the nearest local public school, parents are given the market choice to send their children wherever they want. In this scheme, good schools are supposed to attract more students; and so, in order to compete in the new "educational market," poor schools will have to improve their education. This idea is attractive on the surface level, but the problem is that schools are not businesses and are constrained by their legal public mandates in the extent to which they may choose students or redeploy internal resources. Moreover, some "entrepreneurial" schools may be successful in increasing their enrolments not because they offer quality but because they are better at public relations and marketing. They may impress uniformed parents and students through glossy brochures, attractive cafeterias, nice buildings and sports facilities, or "star" teachers and faculty, but lack the educational basics such as libraries or skilled teachers [4]. This market scheme does not address what should be done with the weaker schools, which may be weak for reasons that are not their fault; and it ignores the educational system's obligation to serve all students fairly.

d. *Upward accountability.* In this context, providers of education (school directors, teachers) are held accountable to groups or individuals (school trustees, boards of governors, municipalities) in positions of greater power than the workers in the teaching profession. But the trustees and governors do not necessarily know better than the school directors, teachers, and parents themselves the things that need to be done in the schools. Probably even less likely to know these things are ministry bureaucrats from far away. A symptom of the latter is poorly conceptualized directives that are unimplementable and time-wasting.

e. *Accountability as appraisal.* Another version of upward accountability can be seen operating in policies about appraisal, which is carried out exclusively by those higher up in the hierarchies of educational institutions. Thus senior teachers appraise junior teachers; department heads appraise senior teachers; and are themselves appraised by inspectors. In this context, appraisal cannot make schools accountable to students and parents, because the teachers in the schools must report to the educational hierarchy and government instead.

f. *Accountability to government.* In conclusion, Epstein says, in the most striking example of upwards accountability in the USA, schools and teachers are to be held accountable to government for the transmission of the curriculums contained in the National Curriculum, as specified by the Ministry of Education. The curriculum set by the Ministry takes precedence over students' and parents' wishes; so here, accountability to the citizens is again lost. Parents might have the theoretical right to hold governments democratically accountable; but in day-to-day practice the

hierarchy of the Ministry, usually allied to businesses and employers, is little accountable to citizens.

It is worth mentioning at least briefly an offshoot to the accountability movement, namely *educational productivity research* described by Monk [8]. It was believed that if policymakers could determine what kinds of education are more productive in terms of finance and learning results than others, then policymakers could design educational programs in ways that are more accountable. Educational productivity research tries to identify which kinds of education, or which means of delivery of education, are more effective across a broad range of factors. Such factors can be organizational, financial, the home environment, the school environment, the qualifications of teachers, the characteristics of students, the curriculum, or just about any other factor that affects education in some way. However, says Monk, for all the educational production research that has been done, it is very difficult to identify reliably the factors that contribute to good learning by students. One therefore surmises that educational policymakers and administrators devise policies and procedures not so much on the basis of empirical pedagogical science, but more simply on the basis of tradition and habit, trial and error, or political convenience.

To reiterate, if we do not have a clear idea of what produces good teaching and learning, we cannot understand what produces quality and accountability. Why do teaching and learning proceed well in one school, but not in a similar school in the same neighbourhood? Why is it so difficult for poor schools to identify the reasons for and to copy the success of good schools? However, policy questions of these kinds often go un-discussed. Consequently we do not have transparent, professional policies, but false consensus, drift, and incrementalism –which are not really policies at all. And if they are not policies, then they are incapable of implementing any reforms that may be necessary for the modern educational environment.

Conclusions. This article has highlighted conceptual issues concerning the educational objectives of quality and accountability, along with the sociological and organizational complexity of educational reform. The article has also emphasized that simplistic policy assumptions should be avoided and that educational institutions are not easily amenable to elitist or market management methods.

Both neo-liberal market and bureaucratic-managerial panaceas are misguided. We should be cautious in devising public policies based on fashions of the day, because the results might be poor. Stakeholders in society, business, and government should certainly take an interest in education, lending support and judicious criticism. But at the end of the day, the teaching community should be entrusted as the main custodian of education, basing itself on common sense.

The educational establishments of all countries need from time to time to deeply re-examine certain operative concepts. In this regard, an informed consensus needs to be reached about the multidimensional and sometimes contradictory notions of quality and accountability. Habit and drift are not helpful to educational policy; instead, educational values and goals should be actively discussed and clarified in broad national discussions, comprising all major interested parties.

A good educational system is ultimately a civic achievement, set within a community of informed and interested stakeholders.

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USE OF THE ORIGINAL OLEKSA VOROPAI HERITAGE IN THE CONTEXT OF MODERN UKRAINIAN STUDIES PEDAGOGICAL RESEARCH

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Abstract. *The Ukrainian studies training of the future philology teacher provides one of the integral places, after which it is the basis of national education, the first step in acquiring the profession of a teacher. Throughout its existence, the Ukrainian people created outstanding examples of spiritual and material art, which entered the treasury of world culture. They reflected the worldview of the nation, its artistic thinking, philosophy, and pedagogy. Therefore, it is essential to involve philology students in Ukrainian folk culture, educate them in the best traditions, and train the new national school teachers. The purpose of this article is to reveal the essence of the Ukrainian studies training of the future philology teacher for Ukrainian folk culture and traditions. To ensure the objectivity and comprehensiveness of the research, a complex of general scientific and pedagogical methods was used, including: analysis of the literature on the researched problem to determine the state of its development and research prospects; comparison to study the points of view of different scientists; systematization and generalization for conclusions; observation of the educational process. In the conditions of the reform and development of education in Ukraine, the problem of schooling, and the formation of higher education in Ukraine at the beginning of the 21st century requires a theoretical and practical solution. In this regard, the conceptual views of prominent figures of Ukraine regarding the development of education in the period under study, as well as a certain experience in the development of schooling and higher education, are of great importance.*

Keywords: philologist teacher, national education, world culture, outlook, art.

JEL Classification: A22, H56
Formulas: 0; fig.: 0; tabl.: 0; bibl.: 12

Introduction. This problem was of interest to many representatives of domestic science. The famous scientist O. Voropai paid special attention to it.

What is decisive in the scientific achievements of a scientist dedicated to the problems of Ukrainian studies? First of all:

> a love for the native language and the native people and their creativity is embedded from an early age, as well as the ability to treat this creativity as something sacred;

> learning, with its peculiar inner atmosphere and deep folk traditions;

> focusing on the works of M. Maksymovich and F. Vovk directed his scientific interest in the field of preservation and study of spiritual monuments and cultural heritage of the people;

> O. Voropai's highly patriotic understanding of the need to create and further develop national science.

The original heritage of O. Voropay is relatively small - 7 books - "Lights in the Church" (Ukrainian folk legends written in Ukraine in 1942-43), "Ukrainian folk dances", "Yasyr", "Traditions of our people", "Traditions", published in Augsburg under the pseudonymous Oleksa Stepovy.

The specificity of his fundamental research "Traditions of our people" in the field of folklore and ethnographic science is that, while describing the folk calendar, he presents separate analytical excursions, while at the same time he sees the preservation of the primary material as the main task (albeit without passportization field records), collected by himself. Regarding the accumulation of these materials in the introductory article to the first volume, he wrote: "This book was written here, in a foreign land, but I started collecting materials for it in Ukraine in 1937 and continued to do so until the beginning of 1943. While staying in Germany from 1944 to 1948, I continued to record folklore and ethnographic material from people who were with me in labor camps from the East and in camps for displaced persons" [1, c. 7].

Aims. The purpose of this article is to reveal the essence of the Ukrainian studies training of the future philology teacher for Ukrainian folk culture and traditions.

Methodology. To ensure the objectivity and comprehensiveness of the research, a complex of general scientific and pedagogical methods was used, including: analysis of the literature on the researched problem to determine the state of its development and research prospects; comparison to study the points of view of different scientists; systematization and generalization for conclusions; observation of the educational process.

Literature review. Reading the introductory article to the publication "Traditions of our people", which for the author was a program document, we learn why, as a biological scientist, like M. Maksymovych, he devoted so much time, effort, and attention to the preservation and study of the spiritual monuments of his native people. The scientist is trying to understand certain terminology and introduce it into ethnological circulation. In particular, it provides several definitions of the concept of "tradition", while paying more attention to the content-emotional side (this

is especially felt in the descriptions of rituals).

Based on the reasoning of well-known authoritative folklorists and ethnographers – prof. L. Biletskyi and Prof. Z. Kuzeli, emphasized the need to study the customs of his people. He wrote: "Traditions are not a separate phenomenon in the life of the people, they are embodied in the movements and actions of worldviews, worldviews and relationships between individual people" [1, p. 5].

The study of Ukrainian culture in schools and the teaching of academic disciplines in the native language is extremely important since these are "the signs by which a nation can be recognized not only in the present but also in its historical past" [1, p. 5].

A. Voropai emphasized that custom and language are the strongest elements that unite individual people into a single nation. At the same time, the culture and language of Ukrainians are not "second-rate", or borrowed. On the contrary, in his opinion, "the meeting of Byzantium with Ukraine is ... a meeting of not the poor with the rich; it is ... a meeting, if not equal, then of cultures close in power, but different in character" [1, p. 6–7]. Later, "soviet" scientists and Ukrainian pseudo-patriots will shout about the second nature and borrowing of Ukrainian culture from "older" brothers. In the second half of the 20th century the outstanding poet Lina Kostenko will be indignant about the slogan "Ukraine rises from its knees", because, in her opinion, as well as in the opinion of O. Voropay, Ukraine as a cosmos and as a logos has never knelt down [2, p. 15].

The study of oral folk creativity is facilitated by the work "Traditions of our people", which, like a bridge in time, connects the past and the future. Using it in classes on Ukrainian language and literature, history, and music will help you learn about Ukrainian oral folk art, see the future through the prism of the past, and understand the present. Pupils and students will gain experience in analyzing a folklore work, understanding the nature of symbols, and the specifics of folk thinking, and learning to define their mission in the important matter of preserving the nation's historical and ethnic memory.

O. Boyko defines the object of ethno-pedagogical research as the process of education as a component of the socio-cultural experience of an individual people and the subject as a pedagogical system of intergenerational relations in a certain ethnic group.

An ethnology pedagogue uses information collected during folklore and ethnographic studies of a certain region. In the process of field research, the entire spectrum of material and spiritual folk culture is covered. Surveying several respondents allows you to collect more objective information.

A vivid example of such work is the work of O. Voropay "Yasyr". In the preface to it, the author notes: "This collection has an educational value for our youth, who will find examples of true heroism and a sense of deep love and respect for our Motherland in these events" [12, p. 7].

The author singles out such features of the national character as morality, a sense of human dignity, the ability to sympathize, mutual aid, the desire for education, and intellectual work: "Even in those cruel, inhumane conditions, some of

the young people found time and opportunity to read books and write poems" [12, p. 4].

In order to collect as much information as possible, he asked for help from friends, acquaintances, and communicated with many people. "Yasyr": Letters, stories and folk art in German captivity" is evidence of the greatness of the spirit of the Ukrainian people. The use of the material collected by O. Voropay in classes on the Ukrainian language, literature and history will contribute to the formation of the best traits of a patriotic citizen in pupils and students.

The analysis of the collection made it possible to single out the following features of the Ukrainian national character:

–love for the native land and the Motherland;

–respectful attitude towards the mother;

–religiosity (it is worth emphasizing that we are talking about 1943–1945, after more than 20 years of Bolshevik terror and atheistic propaganda);

–kindness and sincerity;

–animal spirits;

–chastity;

–industry;

–commemoration of the dead, ancestors.

For example, in the letter of Vera's girlfriend, dated March 20, 1945, sent from Berlin to Oksana's sister, we read the following lines: "My dear sister, how I don't want to die on a foreign land, how I would like to see our village, my house, those flowers, which we sowed together, and our good old mother. ... Our happiness is in God's hands, maybe He will have mercy on me and give me more strength to survive everything."

Results. Respect and love for the mother in almost every letter collected by O. Voropaim:

"It's very sad at home, and I dream about Mom every night…" (December 26, 1943, Braunschweig, letter to Antosia Yaremchuk) [12, p. 17]. In July 1944, the same Antosya wrote to a friend: "For my mother to see me like this, with cropped braids, I don't know if they would tell me?" [12, p. 23].

And here is a letter from her friend Oksana, dated October 15, 1943: "Your father and mother, praise God, are alive and well. Everyone is complaining about you. When will the Lord grant that we will all be together?" (the village of Stepkivtsi in Zhytomyr Oblast) [Yasyr. Letters, stories and folk art in German captivity / Collection. and emphasis. O. Voropai. London: Ukrainian Publishing Union, 1966. 67 p., p. 25].

"My dear, my gentle, dear mother - I need her so much at this time…" (April 5, 1943. From the diary of Klava, a woman from Kharkiv) [12, p. 37].

In camps, in wooden barracks of German farms, Ukrainians remained true to themselves. Faith in God supported them, gave them hope for the best. Girls, tired of work, hunger and diseases, still visited churches on major holidays. What we read about in the letter of the unknown author dated April 22, 1944: "Maria, you write that you were in church on Easter. You do know when Paska was, and I sat in the camp

like that unbaptized Turk, never going out…

The already mentioned Antosya Yaremchuk wrote on May 14, 1945: "... Easter holidays are coming again. Let's go, Maria, to our mothers with belts to visit. Truth?" [12, p. 22].

The desire to remain human in all situations, despite grief and constant humiliation, can be seen in the following letter: "Here we have Easter Friday tomorrow. Let's go, all girls and boys, to fix the grave of our Ukrainian woman who died in the fall. We do not forget about it and learn about it every Sunday. Tomorrow morning I will go to the forest and collect snowdrops for her. She loved these flowers very much. And I love them. They remind us of Ukraine" Tetiana Kovalchuk (April 8, 1944 Liaoning (Bavaria)).

The sincerity and care of these people for each other is impressive, the ability to share the last to help another, sometimes almost a stranger: "Marie, I received your letter and the twenty marks that you invested in the concert.

Thank you very much. It is better to buy something from clothes, as there is a place, because we do not have a place, and there is nothing for it; we eat everything, because it is impossible to live on this portion. In all the time since I've been here in Germany, I've only bought a scarf, stockings, and old shirts, because I don't have anything to go out of the barracks with on Sunday...

Goodbye, Marusya. Thank you again for your help and for not forgetting me. Your friend Antosya." (March 12, 1944).

The next letter, March 29, 1944: "Dear Marusenko! I received your letter and again received 20 stamps.

I thank you, Marusenka, thank you from the bottom of my heart for not forgetting me in this bad foreign land…" [12, p. 18].

Mental pain and thirst for life in the following lines of Antosia Yaremchuk: "Oh, God, how I want to live - to live! I was waiting for the end of the war, but now the end is coming quickly, and I will have to die.

All the girls will return home, their mothers will meet them, but what will mine meet?!

They will only hear:

"Your daughter is gone, she died in Germany and holds the German land there on herself."

How you don't want to die, but to live, to live! I lived only twenty years, and experienced only one grief…" (March 9, 1945).

Traditional upbringing in a rural family, girlish chastity and modesty were preserved by Ukrainian women even in inhumane conditions of existence. Today's youth will probably be surprised and impressed by the words of Kharkiv woman Klava, written on March 7, 1943: "The first Sunday of spring. Beautiful, quiet, sunny - a truly spring morning and ... my first meeting and acquaintance with Andrii Malychenko. My God, I won't come back to myself... Hundreds of kisses, hugs... Hugs here, even on the first meeting... I allowed that." [12, p. 36].

The daughter's words to her father are no less impressive: "Dad, don't let Yarina go to Germany, let her hang herself at home rather than come here to curse the day

she was born." [12, p. 9].

After getting acquainted with the letters of Ukrainian girls who were forcibly taken to work in Germany, pupils and students will not be able to remain indifferent.

For example, during folklore and ethnographic practice in the village of Lady of the Uman District of the Cherkasy Region In 2011, students of the 11th group Shcherba Yu. and Ositrova K. recorded the memories of Zina Maksimivna Rudenko, born in 1925: "I was smaller, and I also had a sister. She was sick. She lay for a long time, and then she began to stand up and was already going to the war. And when the Germans came, it was so scary for us. Yes, they began to gather young girls and boys. And we already knew – they will go to Germany. And there we knew - death. And then the policeman came. Our. local He told his sister to go. And she is thin, frail. Delay her. And I go to the commandant and ask: "Take me, and leave her at home. She is weak. He won't survive and won't be able to do anything." He looked and said: "Take it away." That's how I got to Germany. I got lucky. The landlady was not angry. But it was still difficult. Hungry Although they were not beaten as much as others. And the sister died after the war in the 57th year. So and so" [10].

Folklore and ethnographic research combine a number of tasks - educational, professional, and scientific. This is the deepening of knowledge of Ukrainian folk literature, the formation of folklorist-collector skills in students, as well as the development in students of conducting scientific research, the ability to observe, compare, compare facts, empirical data, and authentic material.

Most of today's young people perceive the history of their people as something detached, "something that happened to someone, once upon a time" and has nothing to do with them. Communication with the interviewees allows them not only to touch the history of their people, but to feel the spirit of that era, it is a direct testimony of the participants of the events. Therefore, field research work is extremely important in the education of nationally conscious citizens of our state.

Discussion. Every year, students of the Faculty of Ukrainian Philology go on folklore and ethnographic practice, where they get to know the folklore and daily life of our people. Oleksa Voropay's work "Customs of our people" is a kind of time machine that allows students to "return" to the past, feel the breath of the era, and get acquainted with the life of their ancestors. Important is the fact that the study, written in the middle of the 20th century, contains information that covers a period of almost a thousand years. It can be argued that thanks to it, a real opportunity is created to connect the past, present and future of our people. That is, during the collection of folklore and ethnographic material, students have the opportunity to study the cultural heritage of their people in its time-space dimension.

On the basis of the research laboratory "Problems of preparing philology students for Ukrainian studies work at school", professor N. P. Sivachuk developed a folklore practice program for students and Assoc. O. O. Tsyganok – program of ethnographic practice. Using the questionnaires, which are placed in the manuals "Methodology of teaching ethnology: Folklore practice", "Practical ethnography", students can make a slice of the depth of folklore memory of the inhabitants of the researched village [3; 11].

The questionnaire contains the following sections: ordering; carols, carols, sowing songs; freckles, ceremonies held on St. George's Day and the Mermaids' Day; Kupala, Petrovcha and harvest rituals; national paremias; riddles; family holidays: weddings and funerals; children's folklore: fairy tales, legends, actually children's songs, fables, jokes, counters, colloquialisms, teasing, invocations, riddles, horror stories, fables, jokes, pastimes, lullabies, games.

Conclusions. Therefore, O. Voropai believed that a special textbook should be created for the study of oral folk literature and the history of the people. Only a thorough assimilation of the best assets of the material and spiritual culture of one's people, according to the scientist, would lead to a change in the erroneous view that it cannot give an intellectual any spiritual nourishment, because it came from such a low and dark environment, where a cultured person has nothing to look for, no what to learn [1, p. 4–8].

O. Voropai made a significant scientific contribution to Ukrainian folkloristics and ethnography. The extensive folklore and ethnographic material collected by the scientist requires further research and is a valuable primary source for studying the spiritual heritage of the Ukrainian people.

Author contributions. The authors contributed equally.

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CHAPTER 2
INNOVATIONS IN THE MANAGEMENT OF EDUCATIONAL INSTITUTIONS

IMPLEMENTATION OF THE PRINCIPLES OF ACADEMIC INTEGRITY IN THE EDUCATIONAL AND SCIENTIFIC ENVIRONMENT OF THE KYIV NATIONAL UNIVERSITY OF TECHNOLOGY AND DESIGN

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Abstract. *Implementation of the principles of academic integrity in the educational and scientific environment of the Kyiv National University of Technology and Design (KNUTD) requires a comprehensive approach, which involves clear methodological recommendations, educational programs and institutional support. KNUTD strives to develop a culture of academic integrity, ensuring that students, teachers and researchers adhere to ethical standards in their educational and scientific activities. This involves preventing plagiarism, promoting honest research methods and fostering a sense of responsibility and integrity in the academic community. The purpose of this article is to provide an example, improve practical approaches, generalize and popularize the system of implementation of the provisions of academic integrity that promote academic integrity among higher education students, postgraduate students, and academic staff of the Kyiv National University of Technology and Design. The main task of the research is to create an environment where academic integrity is valued, understood, and practiced by all members of the university community by enhancing the quality of education, research, and scholarship while maintaining the highest ethical standards. The research methodology consists in the study of normative documents of Ukraine and internal regulations of KNUTD on issues of academic integrity. The main directions for achieving the set goal should be: policy development (development of a clear policy of academic integrity and codes of conduct that define plagiarism, plagiarism and other forms of academic misconduct, outline the consequences for violations and ensure a fair and transparent disciplinary process); educational programs (Integrating academic integrity into the educational process, including modules on proper citation, research ethics, and the consequences of academic misconduct); technological integration (implementation of plagiarism detection tools to detect and prevent plagiarism in academic tasks and research papers); institutional support (establishment of an academic integrity office or committee to oversee policy implementation and review reported cases); ongoing evaluation (regular evaluation of the effectiveness of academic integrity programs through surveys, feedback mechanisms, and case studies).*

Keywords: *academic integrity; educational process; plagiarism; research; teaching; participants of the educational process.*
JEL Classification: I 23, I 29
Formulas: 0; fig.: 0; tabl.: 0; bibl.: 5

Introduction. One of the important conditions for the successful development of higher education in Ukraine, in particular in the training of future pharmacists, process engineers, chemists, analytical chemists, research engineers, designers of the Kyiv National University of Technology and Design (hereinafter - KNUTD) is the implementation and observance of the principles and foundations of academic integrity in the educational process, scientific activities of higher education students, postgraduate students, research and teaching staff of the higher education institution.

Literature review. On September 28, 2017, the Law of Ukraine "On Education" No. 2145-III dated September 05, 2017 came into force. In accordance with Article 6 of the Law of Ukraine "On Education", academic integrity is one of the principles of state policy in the field of education and the principles of educational activity.

Article 42 of the Law of Ukraine "On Education" defines academic integrity as a set of ethical principles and rules established by law that should guide participants in the educational process during learning, teaching and conducting scientific (creative) activities in order to ensure confidence in learning outcomes and/or scientific (creative) achievements.

Aims. The purpose of this article is to provide an example, improve practical approaches, generalize and popularize the system of implementation of the provisions of academic integrity that promote academic integrity among higher education students, postgraduate students, and academic staff of the Kyiv National University of Technology and Design.

Methodology. The main task of the research is to create an environment where academic integrity is valued, understood, and practiced by all members of the university community by enhancing the quality of education, research, and scholarship while maintaining the highest ethical standards. The research methodology consists in the study of normative documents of Ukraine and internal regulations of KNUTD on issues of academic integrity.

Results. Academic integrity at KNUTD is regulated by the Code of Academic Integrity of the Kyiv National University of Technology and Design (2021). The purpose of this Code of Academic Integrity of KNUTD is: to form a high academic culture, the carriers of which are scientific, scientific-pedagogical and pedagogical workers and higher education students; to establish ethical values in the educational process and scientific activities of KNUTD; to improve the image of the University; to prevent violations of academic integrity.

In order to counteract the spread of academic dishonesty in scientific and practical activities, the University takes measures to maintain high professional and ethical standards in all areas of the University's activities: educational, scientific, scientific and technical, artistic and innovative.

In order to prevent and detect academic plagiarism, KNUTD checks academic texts (dissertations for academic degrees; articles for university scientific publications, master's theses, etc.)

Academic integrity is promoted through the KNUTD's internal quality assurance system and systematic outreach. Postgraduate students enrolled in the educational and

research program are familiarized with the Code of Academic Integrity at KNUTD on a mandatory basis.

According to the Code of Academic Integrity of the Kyiv National University of Technology and Design, a violation of academic integrity is considered to be:

academic plagiarism- publishing (in part or in full) scientific (creative) results obtained by other persons as the results of one's own research (creativity) and/or reproducing published texts (published works of art) of other authors without attribution;

self-plagiarism publishing (in part or in full) one's own previously published scientific results as new scientific results;

fabrication is the invention of data or facts used in the educational process or research;

falsification is a deliberate change or modification of existing data related to the educational process or research;

cheating is the performance of written work with the involvement of external sources of information other than those permitted for use, in particular in the assessment of learning outcomes;

deception providing deliberately false information about one's own educational (scientific, creative) activities or the organisation of the educational process;

forms of cheating are, in particular, academic plagiarism, self-plagiarism, fabrication, falsification and cheating;

bribery is the provision (receipt) by a participant in the educational process or an offer to provide (receive) funds, property, services, benefits or any other benefits of a material or non-material nature in order to obtain an undue advantage in the educational process;

biased assessment is a deliberate overestimation or understatement of the results of education of students.

For violation of academic integrity, pedagogical, research and teaching staff of the University may be held academically liable for the following

- refusal to award a degree or confer an academic title;
- deprivation of the awarded academic (educational and creative) degree or academic title;
- refusal to confer or deprivation of a pedagogical title or qualification category;
- deprivation of the right to participate in the work of statutory bodies or to hold statutory positions.

According to the Code of Academic Integrity, KNUTD higher education students may be held academically liable for violations of academic integrity:

- repeated assessment (test, exam, test, etc.);
- repeating the relevant educational component of the study programme;
- expulsion from the University;
- deprivation of an academic scholarship;
- deprivation of tuition fee benefits provided by the University.

According to the KNUTD Code of Academic Integrity, any person in respect of whom a violation of academic integrity has been raised may appeal the decision to

bring to academic responsibility to the body authorised to consider appeals or to the court.

At the university, every student or lecturer can get acquainted with the norms of the KNUTD Code of Academic Integrity, which is posted on the official KNUTD website in the "Access to Public Information" tab.

Research, scientific, pedagogical, and teaching staff must read the Code of Academic Integrity and sign the relevant document to confirm this. The job description of each lecturer contains provisions that provide for compliance with academic integrity in the educational process and scientific (creative) activity and ensure its observance by higher education students.

Enrolled higher education students of the University are obliged to sign the Code of Academic Integrity at KNUTD.

The university has a mandatory plagiarism check for diploma theses, dissertations, and scientific articles. KNUTD uses Antiplagiarism.lnk, a text uniqueness checker, the basic content of which is linked to the library's catalogue of full-text publications and is updated with each new work; KNUTD also checks scientific papers for signs of plagiarism using the Unicheck online service, which is already successfully used by more than 120 Ukrainian universities and 1.5 million users worldwide.

The university publishes 5 scientific journals. All articles are checked for signs of plagiarism using the Unicheck online service. The journal's editorial board analyses any case of plagiarism on its merits. If plagiarism or textual borrowings are detected by editors or reviewers at any stage before the manuscript is published, the author(s) are warned of the need to rewrite the text or make a reference to the original source. If the plagiarism is at least 25%, the article may be rejected, and the author will be immediately informed.

Also, an anonymous survey is conducted among teachers and students on the functioning of the principles of academic integrity. The results of the survey indicate the expediency of communication between teachers and students to discuss issues of academic integrity and students' awareness of responsibility as a result of plagiarism in their papers.

The university has a university-wide practice of involving students in the development of the educational programme, introducing a student survey to assess the quality of the educational process, which contains questions on the specifics of the study. The questionnaire consists of three blocks. Block 1. "Disciplines in the eyes of students of the educational programme" Block 2. "Research practice in the eyes of students of the educational programme" and block 3 "Undergraduate practice in the eyes of students". The processed results of the survey are posted on the official website of KNUT in the form of an analytical report of the survey results.

Kyiv National University of Technology and Design uses MES (Modular Educational Environment) to ensure the effectiveness of learning, a web service that allows authorised users of the university to publish, store in a systematic way, search and use EER (electronic educational resources) of the university's disciplines. The IUCN KNUTD contains teaching and learning resources (T&L) for the disciplines,

including: syllabus, work programme, lecture notes, guidelines for laboratory work, practical and seminar classes, guidelines for coursework (projects), independent work of students, questions for final knowledge control, etc.

The institution offers a compulsory course in Academic Writing and Integrity for 1st year students. Module content: total number of hours - 180, of which: lectures - 12 hours, seminars - 24 hours, student's independent work - 144 hours; ECTS credits - 6. The content of the discipline consists of 6 topics. Topic 1: The concept of academic culture and academic integrity. Topic 2. The concept of copyright. Rules for the use of intellectual property. Topic 3. Plagiarism. Methods of detection and prevention. Topic 4. Scientific style and its means in professional communication. Topic 5. Academic text as a system. Topic 6. Logical and syntactic aspects and culture of scientific text formatting. The means of diagnosing learning progress are individual assignments, presentations, exercises, questions for current and final control, tests.

On 24 February 2023, Ihor Ponomarenko, Head of the Centre for Educational Quality Management, gave a lecture on Academic Integrity for applicants of the first (bachelor's), second (master's) and third (educational and scientific) levels of higher education, as well as teachers of the Faculty of Design of KNUTD. The lecturer introduced the students to the ethical principles and statutory rules that should guide the participants of the educational process during learning, teaching and research and development activities in order to ensure confidence in learning outcomes and research and development achievements. He also informed about the main legislative acts on which the Code of Academic Integrity of the Kyiv National University of Technology and Design is based, which regulates the application of general principles and rules of scientific ethics, establishes moral principles and general ethical norms in relations between representatives of the university community.

In 2020, KNUTD became a member of the Academic Integrity and Quality Initiative project. The project is implemented by the American Councils for International Education, with the support of the US Embassy in Ukraine, the Ministry of Education and Science, and the National Agency for Higher Education Quality Assurance. Academic staff of the University participate in the international research internship program "Academic Integrity". The purpose of the internship is to familiarize themselves with European approaches to the issue of scientific plagiarism and to promote academic integrity, as well as to improve the qualifications of educators and deepen cooperation in the academic and scientific field between Ukraine and Poland.

Thus, academic integrity is one of the elements of the reputation of a higher education institution and has become the norm of everyday academic life in the scientific community. KNUTD promotes academic integrity and uses appropriate technological solutions as tools to counteract violations of academic integrity.

Discussion. The main directions for achieving the set goal should be: policy development (development of a clear policy of academic integrity and codes of conduct that define plagiarism, plagiarism and other forms of academic misconduct, outline the consequences for violations and ensure a fair and transparent disciplinary

process); educational programs (Integrating academic integrity into the educational process, including modules on proper citation, research ethics, and the consequences of academic misconduct); technological integration (implementation of plagiarism detection tools to detect and prevent plagiarism in academic tasks and research papers); institutional support (establishment of an academic integrity office or committee to oversee policy implementation and review reported cases); ongoing evaluation (regular evaluation of the effectiveness of academic integrity programs through surveys, feedback mechanisms, and case studies).

Implementation of changes to the policy of KNUTD on issues of academic integrity will allow to obtain the following expected results:

- cultural shift - a shift in university culture to one that values and prioritizes academic integrity;

- reduced academic misconduct - reduction in cases of plagiarism, fraud and other forms of academic misconduct;

- improved learning environment - an improved learning and research environment where students and teachers can trust the integrity of academic work;

- ethics researchers - graduates and researchers who carry a strong sense of academic ethics in their professional career;

- positive reputation - improved reputation of KNUTD as an institution striving for academic excellence and integrity.

Conclusions. By implementing these measures, KNUTD can create a foundation for academic integrity that supports the educational and scientific mission of the university. Regular policy evaluation and adaptation will be critical to ensure the continued success of these initiatives.

Author contributions. The authors contributed equally.

Disclosure statement. The authors do not have any conflict of interest.

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CLASSIFICATION OF WEB RESOURCES IN THE MODERN INFORMATION SOCIETY

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Abstract. *The article substantiates some features of the classification of web resources in the modern information society. The purpose of web resources is to strengthen intellectual capabilities in the information society, as well as to improve the quality of education at all levels of the educational system. To ensure the objectivity and comprehensiveness of the research, a complex of general scientific and pedagogical methods was used, including: analysis of the literature on the researched problem to determine the state of its development and research prospects; comparison to study the points of view of different scientists; systematization and generalization for conclusions; observation of the educational process. The use of educational web technologies is highlighted and the purpose of using web resources is analyzed. The main pedagogical goals of using web resources are highlighted. It is shown by which features digital educational resources (DER) can be described. It is clarified that information technologies are a condition for the development and use of digital educational resources. It is emphasized that the purpose of using web resources is to strengthen intellectual capabilities in the information society, as well as to improve the quality of education at all stages of the educational system. We considered the classification of digital educational resources. It was noted that they can be described according to the following characteristics: according to functional classification; based on the materials of scientific publications; by structure; according to the organization of the text; according to the nature of the source data; according to the intended purpose; by user group; by the availability of a printing equivalent; by information type; by the degree of didactic provision; by educational and methodical functions; by the nature of user interaction; by distribution technology and depending on the form of ownership. Note that the digital revolution will continue to fundamentally change the way citizens live, work and study. The spirit of innovation and entrepreneurship in education and training must be stimulated and supported by clear political will and efforts to bring innovation into everyone's lives. Innovative practices need to be shared, discussed and disseminated. In the context of new approaches, which also include a digital learning environment, thanks to the digital participation of both teachers and students, they should be constantly interested in improving courses and curricula, self-awareness of the need for continuous training in digital literacy, which will greatly contribute to the transformation of digital universities.*

Keywords: *web resources, information technologies, education, digital educational resources, digital literacy.*

JEL Classification: I 23, I 29
Formulas: 0; fig.: 0; tabl.: 0; bibl.: 25

Introduction. The world we live in is going through an era of digital revolution. The Internet, the trend towards globalization. The rapid growth of information and communication technologies (ICTs) and technology-enabled enhancements of work environments have enriched and enhanced people's professional activities and lives, including the way they work, learn and communicate. In turn, these rapid changes have led to increased information overload and complex situations that require an increased digital skill set. The development of new literacy is a decisive factor for effective functioning in the era of digital technologies, which allows you to feel more fulfilling and productive work. New literacies in today's digital society have been the focus of considerable research and educational attention over the past decade. The 21st century has witnessed important key competencies and, as a result, an increase in research related to technological, information, visual and communication literacy. All these skills constitute the so-called digital competence, one of the basic competences that, according to the European Parliament, every citizen should acquire for lifelong learning. It is difficult to imagine the educational process as a whole without the wide use of various educational technical means and web resources. The first should include the entire complex of computer, multimedia and technical equipment of the educational process - computer workstations, multimedia projector and screen, laptop, interactive whiteboard, modern computer simulators and servers for using pedagogical software and other electronic tools.

Web resources combine a wide range of pedagogical software tools, electronic textbooks, electronic tests, computer models, simulators, didactic games, and stimulators that differ in purpose, level of complexity, form of technical implementation, and interface types [14].

The use of web technologies in the field of education allows teachers to qualitatively change the content, methods and organizational forms of education. The tools of pedagogical activity are being improved, the quality and efficiency of education are increasing. Web resources have a lot of advantages compared to traditional means of education.

Literature review. A comprehensive analysis of the scientific works of Ukrainian and foreign scientists shows that the problem of using web technologies is an actual subject of research by many scientific schools and individual researchers. The problems of informatization of education, the use of multimedia technologies, the analysis of the pedagogical potential of informatization of the educational process are revealed in the works of scientists V. Bykov, M. Zhaldak, Yu. Kazakov, A. Kolomiets, V. Madzigon, Yu. Mashbyts, I. Prokopenko, O. Shlykov etc.

Aims. The purpose of web resources is to strengthen intellectual capabilities in the information society, as well as to improve the quality of education at all levels of the educational system.

Methodology. To ensure the objectivity and comprehensiveness of the research, a complex of general scientific and pedagogical methods was used, including: analysis of the literature on the researched problem to determine the state of its development and research prospects; comparison to study the points of view of

different scientists; systematization and generalization for conclusions; observation of the educational process.

Results. The following main pedagogical goals of using web resources can be identified:

– intensification of all levels of the educational process due to the use of modern information technologies (increasing the efficiency and quality of the learning process; deepening intersubject connections; increasing the volume and optimizing the search for the necessary information; increasing the activity of cognitive activity);

- development of the student's personality, preparation of the individual for a comfortable life in the conditions of the information society (development of different types of thinking; development of communication skills; aesthetic education through the use of computer graphics, multimedia technology; formation of information culture, ability to process information) [9, 19 -21].

Nowadays, the development of information technology is changing every day, and the development and application of multimedia technology has achieved fruitful results. The technologies of mobile internet, internet of things, big data, cloud computing, virtual reality, artificial intelligence are becoming more and more mature, personal terminal devices such as computers are popular at home. Advances in social sciences, education, and humanities research, and portable devices such as tablets, e-readers, and smartphones are widely used in work, study, and life. Information technology is a condition for the development and use of digital educational resources. With the development of information technologies, more and more digital educational resources are developed and used, and different information technologies and their cross-integration will have different effects on the manifestation and functions of digital educational resources [2, 16-18, 20-21].

At the stages of the lesson, when the main educational influence and control is transferred to the computer, the teacher gets the opportunity to observe and record the manifestation of such qualities in students as awareness of the purpose of the search, active reproduction of previously learned knowledge, interest in replenishing knowledge from ready-made sources, independent searches. This will allow the teacher to design his own management activities and the gradual development of students' creative attitude to learning. Providing benchmarks for checking educational activities (through educational tasks or computer programs), providing an analysis of the causes of errors allow students to be gradually taught self-control and self-correction of educational and cognitive activities, which should be in every lesson.

Web resources are an important tool of the educational process, have an educational and methodological purpose and are used to ensure the educational activities of students and are one of the central elements of the information and educational environment [9, 21-25].

Digital educational resources (DER), in particular web resources, can be described according to the following features:

- by functional classification;
- based on the materials of scientific publications;
- by structure;

- according to the organization of the text;
- according to the nature of the source data;
- according to the intended purpose;
– by user group;
– according to the availability of the printing equivalent;
- by information type;
- according to the degree of didactic support;
- by educational and methodical functions;
– by the nature of user interaction;
- by distribution technology;
– depending on the form of ownership [11].

By functional classification.

According to the functional property, which characterizes the meaning and place of the central educational process in the educational process, they can be classified as:

− educational and methodical TSRs;
- methodical TSRs;
− educational CSOs;
− auxiliary CSOs;
- controlling CSOs [9].

According to the materials of scientific publications: - electronic textual analogues of printed publications, such as books, magazines, etc. (it is assumed that the textual information contained in them is presented in a form that allows character-by-character processing);

- electronic images of printed publications, when elements of the latter (for example, pages) are presented as complete graphic images, the same type of electronic information includes images of handwritten materials

– facsimile;

- databases that meet the requirements for electronic information, for example, bibliographic, address, statistical, linguistic, full-text databases belong to the same type, if they do not fully reproduce printed editions;

− new forms of publications that do not have printed counterparts, such as electronic announcements, materials of electronic conferences and other electronic messages available to users through telecommunication networks;

- electronic publications of audio and video information;

− multimedia products (interaction of visual and audio effects under the control of interactive software, as well as a combination of text, graphic images, sound, animation and video elements) [13];

- software products (software intended for delivery to the user);

− combined software and information products, for example, geoinformation systems (information systems designed for collection, storage, analysis and visualization (output) of spatial data) [8];

- electronic games [10].

Digital educational resources can be structurally divided into:

- single-volume (issued as one electronic medium);

- multi-volume (consist of two or more numbered parts, each of which is presented on a separate medium, but at the same time is one whole both in terms of content and design);

- electronic series (a collection of volumes united by a common theme and purpose and published in the same format).

Digital educational resources according to the organization of the text are divided into:

- mono-edition (includes one work, for example: a textbook, a study guide, a course and a synopsis of lectures);

- collections (includes several works of educational literature - a workshop, a textbook, a book for reading).

According to the nature of the source data, the following traditional types of digital educational resources can be distinguished: curriculum, curriculum, methodological guidelines, practice programs, tasks for practical classes, lecture notes, a course of lectures, a workshop, etc.

By purpose, digital educational resources can be divided into:

- official (published on behalf of state bodies, institutions, departments or public organizations, containing materials of a normative and directive nature);

- scientific (contain information about theoretical or experimental research, historical documents);

- popular science (contain information about theoretical or experimental research in the field of science, culture, technology, presented in a form accessible to a non-specialist reader).

- reference;

- advertising [7; 11].

According to the group of users, it is possible to divide into CSOs:

- for schoolchildren;

- for students;

− for masters;

- for pedagogical, scientific-pedagogical, scientific and administrative employees of educational institutions;

− for education seekers;

− for certified specialists;

- for partners and volunteers who are ready to contribute to the development of digital education, access to quality educational materials, information services [15].

The following groups of digital educational resources are distinguished according to the availability of a printed equivalent:

- electronic analogues of paper educational editions (editions that reproduce the corresponding paper edition (location of text on pages, illustrations, links, notes, etc.);

- an electronic analogue of a printed edition (an electronic edition (presented in pdf, doc, jpg, djv, djvu, html, etc. formats), which basically reproduces the corresponding printed edition);

- electronic demonstration materials (electronic materials (presentations, diagrams, video, audio recordings, etc.) intended to accompany the educational process);

- independent TSOs (do not have paper analogues (exist only in electronic version);

- electronic educational content (a form of transmission of information, cultural and historical heritage, exchange of life experience and knowledge transmitted through websites, videos or various programs) [7].

The classification of TSR by information type is divided into:

- TSR with text information;

- CSD with visual information:

collections: illustrations; photographs; portraits; video fragments of processes and phenomena; demonstrations of experiments; video tour;

models: 2-3 dimensional static and dynamic; objects of virtual reality; interactive models, symbolic objects: schemes; diagrams; formulas, maps for subject areas;

multimedia environment (information and reference sources, workshops (virtual constructors), simulators and test systems, programmed training aids (electronic textbooks, virtual tours, etc.) [3];

− TSR with combined information (textbooks; study guides; primary sources and anthologies; books for reading; problem books; encyclopedias; dictionaries; periodicals);

- TSR with audio information (sound recordings of performances; sound recordings of musical works; sound recordings of living nature; sound recordings of inanimate nature; synchronized audio objects);

− Centers with audio and video information (audio and video objects of animate and inanimate nature; subject excursions; encyclopedias);

- interactive models: (electronic laboratory workshops; subject virtual laboratories, electronic didactic demonstration materials (presentations, diagrams, video and audio recordings, etc.), designed to accompany the educational process).

- TSRs with a complex structure (textbooks; study guides; primary sources and anthologies); original texts (textbooks; texts from special dictionaries and encyclopedias; texts from scientific, popular science, educational, fiction, etc.) that do not repeat stable textbooks [4].

By degree of didactic support:

− TSR, which covers the specialty;

− TSR, which covers the discipline;

− TSR, which covers the topic (section) of the discipline;

− SDG, which covers part of the topic.

Discussion. According to educational and methodical functions, digital educational resources are used for:

− for lecture accompaniment (slides, video fragments, audio accompaniment);

- to accompany the workshops;

- for independent work;

- for distance learning;
- for self-education;
- for short-term courses and for the system of professional development [5].

According to the goals of using the SDGs in the educational process and their capabilities, the following types of SDGs are distinguished:

According to the nature of user interaction, two groups can be distinguished:

- deterministic (parameters, content and method of interaction, which are defined by the publisher and cannot be changed by the user);
- non-deterministic (interactive) (parameters, content and method of interaction with which are directly or indirectly set by the user in accordance with his interests, purpose, level of training, etc., based on specific data and with the help of algorithms defined by the publisher).

According to the distribution technology, the following groups are distinguished:

- autonomous - are characterized by the fact that their use is carried out autonomously on the user's computer without the need to connect to the network. In addition, the amount of these resources can be arbitrary depending on the power of the computer and its hardware;
- network - installed on the server and used when connected to the network.

The amount of resources that can be used depends on the bandwidth of the network;

- combined - are usually used when combining autonomous and network CSOs.

The main CSOs are used autonomously, and their management and interaction of the client computer with the server is carried out using the network.

Depending on the form of ownership:

- open (their use is free);
- closed - their use is carried out only with permission. Having permission, the user must enter his login and password, which are issued by the developers' administration;
- combined (access to individual parts or the entire OER is free, but in demonstration mode (so-called demo versions) [11].

As a rule, information sources include separate information objects: elementary information objects (which, if it is possible to separate them, can be used independently within the framework of information systems) and complete full-fledged information sources.

Elementary information objects can be considered: as an organic component of the traditional educational process, which does not replace, but complements and expands the possibilities of traditional, methodically appropriate means of education, thereby increasing the effectiveness and quality of education; as objects of designing an educational and informational environment within the framework of pedagogical design with the use of tools, which will increase the effectiveness of the use of ICT in the educational process.

Finished full-fledged information sources - final digitized products covering the entire educational course or section (theme) are considered as a meaningful component of IT, which determines their main functionality.

Informational and educational final digitized products (original texts that do not repeat stable textbooks) are considered as additional to the main ones [1].

Conclusions. So, we considered the classification of digital educational resources. It was noted that they can be described according to the following characteristics: according to functional classification; based on the materials of scientific publications; by structure; according to the organization of the text; according to the nature of the source data; according to the intended purpose; by user group; by the availability of a printing equivalent; by information type; by the degree of didactic provision; by educational and methodical functions; by the nature of user interaction; by distribution technology and depending on the form of ownership.

Note that the digital revolution will continue to fundamentally change the way citizens live, work and study. The spirit of innovation and entrepreneurship in education and training must be stimulated and supported by clear political will and efforts to bring innovation into everyone's lives. Innovative practices need to be shared, discussed and disseminated.

In the context of new approaches, which also include a digital learning environment, thanks to the digital participation of both teachers and students, they should be constantly interested in improving courses and curricula, self-awareness of the need for continuous training in digital literacy, which will greatly contribute to the transformation of digital universities.

Today, major universities have opened their doors to the online sphere in the sense of expanding access to education for anyone regardless of geographic region, age, gender, race, ethnic origin.

Digital educational resources enable the education of a large number of participants in the educational process with different goals, interests, knowledge and skills to help create a community of lifelong learning.

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CHAPTER 3
THEORY AND METHODS OF VOCATIONAL EDUCATION

ENVIRONMENTAL EDUCATION AND EDUCATION OF FUTURE BIOLOGY TEACHERS

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Abstract. *The article reviews and analyzes the state of environmental education and upbringing of future biology teachers. The purpose of the article is to establish the role of economic education in the education of future teachers of biology. To test the research hypothesis, various methods were used: conversation, observation, survey, questionnaire, methods of mathematical statistics for quantitative and qualitative analysis of experimental data, determination of the reliability of the results. The methodological basis for revealing the essence of the state of environmental education and upbringing of future biology teachers at the present stage of society's development is based on various approaches and principles. The necessity of improving and saturating the content of the educational process with environmental material and creating appropriate conditions for the environmental education of future biology teachers is proved. Environmental education and upbringing are becoming the core of modern education and serve as a key to the restructuring of its modern systems and society as a whole. The role of environmental education as the basis of a new morality and a support for solving numerous issues of people's practical life is especially relevant. The basic principles of environmental education and upbringing of future biology teachers are revealed, such as: the principle of practical orientation, the principle of continuity and consistency, the principle of activity and consciousness, the principle of nature correspondence, the principle of interdisciplinarity. The main approaches to the development of environmental education and upbringing are highlighted: natural science, naturalistic, global-biospheric, problematic, and value-based. The current state of development of environmental education and upbringing is characterized by the search for new ways of cooperation between teachers and students, during which the latter become initiative, independent and creative individuals.*

Keywords: environmental education, principles of environmental education, approaches, principles, biology teachers, future biology teachers.

JEL Classification: I 23, I 29
Formulas: 0; fig.: 0; tabl.: 0; bibl.: 5

Introduction. Environmental education and upbringing is currently one of the priority areas of work with young people, an organized and consistent pedagogical process. The organization of the process of environmental education requires a clear definiti on of all its links, identification of connections and dependencies, formation of a system of environmental knowledge, skills, attitudes, beliefs, moral qualities, and ensures the formation and development of a responsible attitude towards nature.

Environmental education and upbringing are becoming the core of modern education and serve as a key to restructuring its modern systems and society as a whole. The role of environmental education as the basis of a new morality and a support for solving numerous issues of people's practical life is especially relevant.

Environmental education focuses on the relationship between humans and their environment and forms a system of scientific knowledge, attitudes and beliefs that lay the foundation for a responsible and effective attitude towards the environment.

An important aspect in solving the problem of preserving natural resources is the education of people in the field of environment, environmental education of the entire population, especially the younger generation. The environmental problem grows into the problem of transforming the spontaneous impact of people on nature into a conscious, purposeful, systematically developing interaction with it. Such interaction can be realized if each person has a sufficient level of environmental culture and environmental awareness, the formation of which begins in early childhood and continues throughout life.

Literature review. The founders of the development of environmental education were I. Suravehina, O. Zakhlebnyi, I. Zverev, who substantiated the theoretical foundations, developed conceptual provisions and laid the foundation for environmental education. V. Bakirov, V. Krysachenko, N. Nazarova, V. Serikov dealt with the issues of environmental education in pedagogical theory and practice; S. Hlazacheva, A. Nekos, S. Shmaley - with the interaction of environmental concepts and modern trends in education.

V. Krysachenko, I. Pavlenko, G. Pustovit, S. Skrypnyk, L. Simonova were engaged in fundamental research in the field of environmental education.

A. Volkova in her research defines the place and role of environmental education in the lessons of the natural history cycle. She has developed samples of lessons with environmental content, proposed a system of work on environmental education when planning naturalistic work at school, and pointed out the effectiveness of work due to the combination of different teaching methods, which contributes to the sustainable formation of environmental knowledge [2].

Aims. The purpose of the article is to establish the role of economic education in the education of future teachers of biology.

Methodology. To test the research hypothesis, various methods were used: conversation, observation, survey, questionnaire, methods of mathematical statistics for quantitative and qualitative analysis of experimental data, determination of the reliability of the results.

The methodological basis for revealing the essence of the state of environmental education and upbringing of future biology teachers at the present stage of society's development is based on various approaches and principles.

Results. Nowadays, when environmental problems are becoming global in scope due to irreversible changes in the biosphere and limit human life opportunities, environmental education and upbringing also acquire a special social meaning.

The growing relevance of the problem of environmental education is caused by a number of factors:

- the need to improve the environmental culture of citizens;

- the need to constantly preserve and improve human living conditions on the planet;

- the need to solve urgent problems related to the reduction of living space per person;

- the need to preserve, restore and rationally use natural resources;

- low level of perception of environmental problems as personally significant;

- insufficiently developed skills and abilities of practical participation in environmental activities [3, c. 28].

The current state of development of environmental education and upbringing is characterized by the search for new ways of cooperation between teachers and students, during which the latter become initiative, independent and creative individuals. The role and place of the student in educational work is changing significantly, and the functions of managing this process by the teacher are changing. Today, students are required to acquire knowledge and be creative on their own, and teachers are tasked with facilitating this.

"Environmental education is a continuous process of training, education and personal development aimed at forming a system of scientific and practical knowledge, value orientations, behavior and activities that ensure a person's responsible attitude to the surrounding social and natural environment. Environmental education should represent a holistic system that covers the entire human life. It also aims to form a worldview based on the idea of unity with nature." [1].

Environmental education is a "conscious and systematic development of knowledge about the environment throughout life". Its main goal is to form an understanding of the environment, the specifics of its internal relations, the nature of anthropogenic impact, and the principles of harmonious development of humans and the natural environment.

By environmental education, I mean the development of will, feelings, and character traits that would manifest themselves in the correct (ethical) behavior of my students in relation to the natural environment. It should be voluntary and continuous throughout a person's life. The goal of environmental education is to form a similar consciousness that includes the concept of environmental morality - a balance between the perception of the environment, its upliftment, and the behavior of people in it.

Environmental education forms a person's worldview aimed at ensuring environmental protection and is a worthy platform for environmental education, which is a combination of various environmental knowledge, environmental thinking, environmental outlook, environmental ethics, and environmental culture. The main goals of environmental education are: mastering scientific knowledge about the environment, complex interrelationships in nature that have developed over a long period of historical development; formation of research knowledge and skills aimed at developing intellect, creative and business activity; understanding of modern environmental problems and awareness of their relevance to oneself; formation of environmental awareness and culture of the individual, awareness of being part of nature.

A. Zakhlebnyi actively worked on the theory of environmental education. Analyzing the relationship in the society-nature system, he identified the following features:

The development of industry on the planet leads to a violation of the integrity of the biosphere;

- industrial development leads to pollution with substances that were not part of the natural cycle of the biosphere (this, accordingly, leads to its gradual destruction);

- the disappearance of natural resources gives rise to new problems (the search for and use of new sources of energy and raw materials, which leads to new environmental problems).

A. Zakhlebnyi paid special attention in the theory of environmental education to solving the problems of developing a system of tasks aimed at developing students' value orientations and forming the need for environmental protection and ecological activities.

The theoretical model of environmental education (developed by A. Zakhlebnyi) contains four blocks:

- the first block combines the factors that determine the formation of the worldview, views, beliefs and actions of students;

- the second block includes factors that determine the properties of the student's personality in specific types of activity (behavior);

- the third block combines pedagogical conditions of influence on the student's personality (feelings, intelligence, etc.);

- the fourth block contains pedagogical means by which environmental education of students is provided.

A. Zakhlebnyi introduced the following into the content of environmental education of students:

- a system of knowledge about nature, society, principles of nature management, ways to optimize interaction in the society-nature system)

- a system of skills and abilities (intellectual and practical) of environmentally oriented activities;

- experience in studying and actual practical participation in nature protection;

- a system of norms that appear in the evaluative and emotional attitude to nature.

V. Nazarenko identifies different models of environmental education organization that are typical for secondary schools today. These include the inclusion of environmental information in traditional subjects; studying environmental issues in a specially designated subject; forming environmental knowledge in various subjects and then integrating it into a separate subject; and a complete reform of the educational process.

The main strategic directions of environmental education development are as follows:

- development of scientific foundations of continuous environmental education based on the National Doctrine of Education Development in the XXI century, achievements of Ukrainian and foreign pedagogical practice with the participation of the Academy of Pedagogical Sciences of Ukraine, leading scientists and practitioners of the educational sector, the Ministry of Ecology and Natural Resources of Ukraine, and public environmental organizations;

- gradual, step-by-step reform of environmental education and personal upbringing based on scientific and spiritual principles, taking into account national traditions, achievements and international experience;

- formation of generations with a new ecological culture, a new ecological outlook based on the principles of humanism, ecologization of thinking, interdisciplinary integration, historicism and systematicity in order to preserve and restore the nature of Ukraine and its biological diversity;

- development of international relations and cooperation in the field of environmental education and science, environmental protection, rational use of natural resources, preservation of the biosphere and civilization.

Discussion. An integral part of environmental education is the principles and approaches to environmental education itself.

L. Khomych identifies the following approaches to environmental education:

- practical, which arose as a result of socio-economic transformations in our country, the emergence of new types of educational institutions other than secondary schools; they require a new teacher with a holistic view of professional activity; the future teacher must act independently, master special skills and abilities of interaction and communication in the process of psychological and pedagogical training; in order for teacher training to meet modern requirements, it is necessary to intensify the development of the methodological and theoretical basis of teacher education;

- theoretical, due to both socio-economic and practical changes in the development of public education; teacher education is developing along the path of forming a holistic view of their professional activity in future teachers, so most pedagogical institutions of Ukraine include integrated courses of psychological and pedagogical disciplines in the curriculum and on this basis purposefully organize the formation of professionally important qualities of the future teacher, his/her professional consciousness and behavior, and also promote the development of individuality [5].

The main goal of environmental education of future biology teachers is to form an ecological culture of schoolchildren, which cannot be achieved without the use of

the following principles:

- the principle of practical orientation. This principle is responsible for the acquisition of skills in the study of practical environmental work in the course of practice and laboratory work provided by the program and during optional and circle work;

- the principle of continuity and consistency. It is characterized by the constant exchange of knowledge, continuity and sequence of studying environmental education throughout the entire period of study;

- the principle of activity and consciousness. This principle implies that students consciously perform environmental tasks to carry out environmental work, without being reminded by the teacher;

- the principle of nature correspondence. This principle characterizes nature as the basis of child development, aimed at taking into account the multifaceted nature of man, developmental features in terms of age and gender;

- the principle of interdisciplinarity. It ensures the study of nature protection processes that have arisen as a result of human activity in the process of implementing interdisciplinary connections, integration of school disciplines [4].

Since environmental education and upbringing of young people is primarily related to the natural sciences, we have identified the main approaches to the development of environmental education and upbringing:

- natural science - this approach is based on the lack of knowledge about nature, natural relationships and the consequences of human impact on the environment. The solution to the problem is seen in teaching environmental knowledge to as many people as possible through various natural science disciplines: biology, physics, chemistry, geography, etc;

- naturalistic - the main idea can be formulated as "studying nature in nature, not through abstract theoretical knowledge";

- global-biospheric - considers the environmental crisis as a global planetary phenomenon. The way out is seen in people's understanding of the essence of global environmental problems and political solutions that concentrate the efforts of the international community;

- problematic - considers the crisis as a result of the cumulative effect of existing environmental problems: environmental pollution, reduction of biodiversity, depletion of natural resources, etc. It aims to educate people to take responsibility for those around them and to overcome specific problems. The solution to the problem is seen in teaching people specific skills to protect or restore the environment and developing their personal responsibility for their actions;

- value-based - views the environmental crisis as the result of material interests prevailing over spiritual ones. Creating the conditions for people to find their way to reunite with life and the world is one of the tasks of the new philosophical trend of "deep ecology";

- cultural and civilization - considers the problem as a systemic crisis of civilizations, which requires the formation of centers of a new culture. It promotes norms of behavior that cause the least damage to nature (water conservation,

recycling, etc.). It echoes the principles of many religious and philosophical teachings and states that solving environmental problems is impossible without world peace, human rights and social justice [2].

All the above-analyzed approaches are important components of the development of environmental education and upbringing, in which learning takes place through knowledge of subjects such as biology, chemistry, geography, etc.

Conclusions. Environmental education and upbringing of future biology teachers is an important problem of our time, which consists in mastering scientific knowledge about the environment, complex interrelationships in nature, forming knowledge and skills of a research nature, understanding modern environmental problems, forming environmental awareness and culture of the individual.

The main goal of environmental education and upbringing of future biology teachers is to form an ecological outlook based on the unity of scientific and practical knowledge, responsible and positive emotional and value-based attitude to their health, environment, improving the quality of life, and meeting human needs. The problem of the general deterioration of the ecological situation is the insufficient or low level of environmental knowledge of the population. This issue can only be resolved through environmental education and upbringing of the younger generation.

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FORMATION OF SOFT SKILLS IN FUTURE TEACHERS AS A CONDITION FOR THE IMPLEMENTATION OF THE TEACHER'S PROFESSIONAL STANDARD

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Abstract. *Soft skills play a leading role in student education, which is why their development in future teachers requires reflection in professional standards. The purpose of the article is to substantiate the need for the formation of soft skills in future teachers in the conditions of the implementation of the teacher's professional standard. To test the research hypothesis, various methods were used: conversation, observation, survey, questionnaire, methods of mathematical statistics for quantitative and qualitative analysis of experimental data, determination of the reliability of the results. The authors of the article considered options for the organization of educational activities of future teachers regarding the formation of soft skills as a condition for the implementation of the teacher's professional standard. The professional standard of the teacher was considered and a number of competencies were singled out, the formation of which depends on the development of soft skills. The results of the survey of teachers, education seekers and stakeholders regarding the problem of soft skills formation were analyzed and difficulties in their formation were revealed. A map of the development of soft skills in pedagogy classes is proposed, in particular, the potential of using the "inverted classroom" model as one of the advanced technologies for building the educational process is revealed.*

Keywords: *formation; soft skills; hard skills; future teachers; teacher's professional standard; educational process; institution of higher education; modern forms and technologies of education; "inverted classroom".*

JEL Classification: I 23, I 29
Formulas: 0; fig.: 0; tabl.: 0; bibl.: 5

Introduction. The latest technologies, globalization, and the socio-economic situation in our country have significantly influenced its development. The results of education, which were sufficient for previous generations, are not enough to be successful in our time. In the conditions of the development of modern trends in general education and the active search for innovative school models, focused primarily on the interests of the student, a new type of teacher is being formed - a consultant, associate, educator, project manager, communicator, researcher, innovator, able to think outside the box, ready to flexibly respond to conditions, that are changing, and creatively solve professional tasks. Nowadays, the demand for such a teacher is in the center of attention of the teacher education system, the restructuring of which is increasingly determined by such challenges as public recognition of the need for changes in schools and the appropriate training of teachers, the presence of goals and objectives of educational policy formulated at the state level, requirements for teacher training from the employer, the regulatory framework for the modernization of pedagogical education.

Literature review. In this regard, the Ministry of Economic Development, Trade and Agriculture approved the professional standard for the following teaching professions:

1. Teacher of primary classes of general secondary education institution;
2. Teacher of general secondary education institution;
3. Primary education teacher (with a diploma of junior specialist).

"The new professional standard is the embodiment of the modern approach of the National Academy of Sciences to defining the list and description of the general and professional competencies of a teacher. The document defines general (civic, social, cultural, leadership and entrepreneurial) and professional (language-communicative, subject-methodical, information-digital, psychological, emotional-ethical, pedagogical partnership, inclusive, health-preserving, projective, prognostic, organizational, evaluative and analytical, innovative, reflective, ability to learn throughout life) competence of the teacher" [4]. Considering this, many of the competencies specified in the standard relate not only to teachers' acquisition of professional knowledge, but also to taking into account emotional and communication skills.

In foreign educational practice, emotional and communicative qualities are considered soft skills, or "soft" skills that complement hard skills - technical/"hard"/professional skills. Hard skills, as a rule, are narrowly professional, refer to job instructions and qualification characteristics. Soft skills, in contrast to hard skills, are a set of super-professional skills that are responsible for successful participation in the work process, high labor productivity; they are important for successful professional and life self-determination of any person, regardless of profession [2]. Soft skills include the ability to communicate, the ability to lead, cooperation, diplomacy, building relationships; the ability to present one's ideas, creatively solve tasks. Since the teaching profession involves the presentation of oneself and one's ideas, the ability to build relationships with various subjects of the educational process: students, parents, teachers, management, to demonstrate

leadership qualities, the formation of soft skills becomes especially relevant. The essence and content of the concept of soft skills have been researched and defined by many foreign (R. Bolstad, S. Boyd, K. Dweck, G. Claxton, G. Powell, R. Hipkins, M. Chambers, etc.) and domestic (O. Abashkina, E. Hayduchenko, V. Davydova, E. Yegorov, N. Zhadko, T. Kozhushkina, K. Koval, S. Nakhod, O. Sosnitska, L. Familyarska) by researchers, organizations (UN, OERS, EU). In particular, S. Nakhod substantiates the value of soft skills for the professional development of future specialists in socio-economic professions; L. Koval considers the development of soft skills among students as a factor in their successful employment; T. Kozhushkina investigates interpersonal interaction as a component of soft skills of students of the pedagogical college; Yehorov analyzes the development of soft skills in the training of future professionals in the tourism industry; A. Sokolova and G. Matyuha are working on the problem of developing soft skills in teaching English to schoolchildren; O. Zhukova investigates the development of soft skills in students in the process of extracurricular work through solving mathematical problems in the form of a game.

Aims. The purpose of the article is to substantiate the need for the formation of soft skills in future teachers in the conditions of the implementation of the teacher's professional standard.

Methodology. To test the research hypothesis, various methods were used: conversation, observation, survey, questionnaire, methods of mathematical statistics for quantitative and qualitative analysis of experimental data, determination of the reliability of the results.

Results. Considering that the teaching profession is designed not only to ensure the quantitative implementation of the tasks of compulsory education, but also to raise the education and culture of citizens to a much higher level, we believe that it is the high level of development of soft skills that will contribute to the formation of a free, energetic and independent personality of a teacher who is able to act in very fast-changing conditions and to be a role model for students. We agree with the opinion of L. Familyarska, who interprets soft skills as a sociological term that characterizes a list of personal characteristics that are somehow related to effective interaction in the process of professional activity: the ability to convince, find an approach to people, interpersonal communication, conducting negotiation processes, teamwork, personal development, erudition, creativity, communication interaction, high level of self-organization, etc. [3]. Regarding the classification of soft skills, in our opinion, the classification proposed by K. Koval is the closest to the teaching profession: individual qualities (the ability to make decisions and solve problems, clearly set tasks and formulate goals, positive thinking and optimism, customer orientation and the ultimate result); communication skills (the ability to clearly formulate thoughts, the ability to interact with different types of people, to structure and moderate meetings, to answer reasonedly, clearly, on time and politely, to prepare and make high-quality presentations, to take cultural and international characteristics into account); managerial qualities ("play" in a team, unite and

motivate it, teach and develop each member, prevent risks and prevent their occurrence, clearly plan and manage working hours) [2].

As the analysis of scientific studies of the outlined problem and own experience shows, there are currently two approaches to the formation of soft skills. The first is to teach directly, introducing separate courses within the variable component of the curriculum: for example, some foreign universities (Harvard University, Stanford Research Institute, etc.) practice a team building course. The second approach is to use the potential of educational disciplines in combination with non-formal education and extracurricular work of education seekers.

When forming soft skills in future teachers, one should not only take into account what skills need to be formed, but also how to achieve the goal and how to diagnose the level of mastery of soft skills.

Based on the study of the literature and the survey of students of higher pedagogical education, teachers and stakeholders, we conducted an analysis of the current situation of the development of soft skills among future teachers in the educational process of the institution of higher pedagogical education. The results of the survey allow us to state that there are certain difficulties in the formation of soft skills, namely:

- insufficient interest in the problem of soft skills formation, personal attitudes towards understanding the importance of soft skills development;
- insufficiently developed vertical and horizontal connections between individual components of the process of professional training of future teachers (purpose, content, technologies, means, forms);
- weak diversification of psychological and pedagogical disciplines, their excessive theorization, separation from school practice;
- insufficient practical manifestation of various soft skills due to insufficiently developed connections between theoretical and practical pedagogical training;
- insufficient reliance on interdisciplinary connections, modern educational technologies and interactive forms and methods of learning and education;
- the difficulty of diagnosing the level of development of soft skills, as a result of which they practically remain unassessed;
- insufficient flexibility and mobility in the organization of the soft skills development process, which prevents prompt response to educational requests.

The results of the teachers' survey showed that only 20% of teachers purposefully include soft skills development tasks in the content of lectures and practical classes. 25% of teachers use technologies and methods of active and interactive learning (discussion, debate, case studies, decision tree, role-playing situations, cooperative learning, etc.).

Students, understanding the importance of soft skills, name traditional lecture-seminar classes, the stereotype of the teacher's role behavior, the lack of examples of a different way of behavior, as well as limited opportunities for acquiring implementation experience and soft skills in various interaction situations, as the main reasons for their insufficient development.

The revealed facts confirm the need to organize targeted work on the development of soft skills among future teachers in higher education institutions.

In our opinion, psychological and pedagogical disciplines and informal education have great potential in the development of soft skills.

We offer a map that we use for the purpose of forming soft skills in future teachers in pedagogy classes. This map contains three blocks:

1.   cognitive skills development block: ability to think panoramically and critically (development of "teacher-learner"relationships); formation of project thinking (ability to predict, goal setting); development of decision-making skills in situations of lack of time (speed of reaction, speed of data processing); development of skills to creatively solve pedagogical tasks;

2.   block of development of activity abilities: leadership qualities, ability to manage oneself and the audience (organizational abilities, verbal and non-verbal communication); the ability to create texts, the ability to visualize information; the ability to interact with other people;

3.   block of development of personal abilities: the ability to express one's thoughts in public (the ability to express one's thoughts clearly, competently and comprehensively, to interest the audience with the prospect of an interesting and useful matter, self-presentation); the ability to work in a team (in particular, work in a project group); communication skills; the ability to motivate, inspire, captivate; the ability "to see" another person; mastering time management skills, self-organization).

By meaningfully focusing the activity of the teacher on the development of soft skills in future teachers, it is necessary to change the format and technology of interaction between teachers and students of education. Traditional forms of classes are not of interest to the modern generation of students. They are fascinated by gamification, e-learning (electronic learning), m-learning (mobile learning). Therefore, when designing forms of interaction with students in the process of developing soft skills, it is important to take into account a number of modern trends. For this, it is necessary: first, to implement the transition from knowledge transfer to knowledge creation.The availability of knowledge and the high speed of its exchange often allows to be more successful not the one who knows more, but the one who searches faster and better, identifying, analyzing and creating information; secondly, the transition from the traditional "teacher-student" system to "teacher-student" interaction, organization of interaction and teamwork; third, the transition from narrow specialization to cross-functional training. In the end, as practice shows, it is desirable to use various combinations of forms and methods of educational activities: work in the classroom, e-learning, projects (practical, social, etc.), simulations in order to maximize the involvement of future teachers and consolidate professional and soft skills competencies.

Discussion. At the pedagogy classes, we tested the "inverted classroom" model, aimed both at the development of soft skills and at the preparation of future teachers for its implementation in their professional activities. This model is one of the mechanisms for the implementation of mixed education, which is gaining popularity in advanced foreign and domestic practices. The idea of the "inverted class" consists

in the independent mastering of new knowledge by the students on the basis of specially prepared video resources (educational videos) with further discussion, consolidation and solving of creative and educational tasks in class.In our opinion, this model of education has a number of significant advantages: it optimizes the combination of traditional and innovative approaches to education, forms panoramic thinking and develops meta-subject skills; forms the ability to work in a team: teachers, students, teachers; the possibility of use in the system of inclusive education; mobility and ease of access to educational resources.

As our experience shows, such well-known forms as student self-government, volunteer programs, social projects, trainings, etc. have proven themselves well in the process of developing soft skills in extracurricular activities. Such forms of work allow, along with professional competences, to develop in future teachers the abilities of communication, leadership, cooperation, diplomacy, building relationships, forming motivation for success, forming team skills, the ability to present ideas, make decisions, and creatively solve tasks. These competencies belong to soft skills, the possession of which largely determines the success of students' future professional activities, helps to successfully implement themselves in a rapidly changing world.

All these are the first steps on the way to the transition to a new educational model of professional training of future teachers, which still require analytical understanding, but, it seems to us, are being created in line with modern trends in the development of education, state and public expectations and requests for it.

Conclusions. The authors of the article considered options for the organization of educational activities of future teachers regarding the formation of soft skills as a condition for the implementation of the teacher's professional standard. The professional standard of the teacher was considered and a number of competencies were singled out, the formation of which depends on the development of soft skills. The results of the survey of teachers, education seekers and stakeholders regarding the problem of soft skills formation were analyzed and difficulties in their formation were revealed. A map of the development of soft skills in pedagogy classes is proposed, in particular, the potential of using the "inverted classroom" model as one of the advanced technologies for building the educational process is revealed.

Author contributions. The authors contributed equally.

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ECOLOGICAL AND METHODOLOGICAL PRINCIPLES IN THE DEVELOPMENT OF RESEARCH ON AIR POLLUTION OF UKRAINIANS

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Abstract. *The possibilities of human impact on nature are constantly growing and have already reached a level where humans can devastate the planet, destroy all living beings, and completely alter the climate. High levels of pollution are characteristic of areas around regional centers in Ukraine, especially in the suburban zone of industrially developed Kyiv. The higher the pollution level, the greater the risk to the health of the population and the state of the environment. Long-term pollution of the atmospheric air with sulfur dioxide, carbon oxides, nitrogen oxides, and other harmful substances negatively affects human health. This can result in an increase in overall morbidity caused by damage to specific organs and body systems, such as respiratory diseases (pneumonia, bronchial asthma, and other non-specific lung diseases) and cardiovascular diseases (hypertension, myocardial infarction, chronic diseases, etc.). The purpose of the article is to identify negative factors that affect the worsening of the environmental situation in the country and individual regions. The main task of my work is the analysis of negative changes in the ecological state of Boyarka and advocacy of possible ways to improve the ecological situation in the city. This study also shows the importance of chemistry as a science in the understanding and development of current environmental problems of our time. On the basis of a systemic approach, the tasks of creating ecologically safe living conditions for the population of suburban areas of the city were solved by conducting noise protection measures. Experimental studies were carried out using modern acoustic measuring devices "Octava-101" and "Ekofizika-Octava". Data processing involved the use of mathematical statistical methods. Mathematical and statistical methods were used to assess the reliability of experimental results. The main results of the article were the measures (economic, legal, urban planning, etc.) to solve the environmental problems of the city of Boyarka.*

Keywords: *Earth's atmospheric envelope, environmental pollution, intensive traffic, ecological problem, population health issues, suburban areas, sanitary conditions.*

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Introduction. The possibilities of human impact on nature are constantly growing and have already reached a level where humans can devastate the planet, destroy all living beings, and completely alter the climate. The Earth's atmospheric envelope is one of the most crucial conditions for life. Without food, a person can live for a month, without water - a week, but without air, they can only survive for a few minutes. The atmosphere has significant ecological importance as it protects living organisms from harmful cosmic radiation and meteorite impacts, and serves as a carrier of heat and moisture. It facilitates processes like photosynthesis and the exchange of energy and information, which are fundamental in the biosphere. The presence of the atmosphere on the planet leads to various complex exogenic processes, such as the weathering of rocks, the movement of air masses, and natural water cycles. For some organisms, like bacteria, flying insects, birds, and others, the atmosphere is their primary living environment.

High levels of pollution are characteristic of areas around regional centers in Ukraine, especially in the suburban zone of industrially developed Kyiv. The higher the pollution level, the greater the risk to the health of the population and the state of the environment. Long-term pollution of the atmospheric air with sulfur dioxide, carbon oxides, nitrogen oxides, and other harmful substances negatively affects human health. This can result in an increase in overall morbidity caused by damage to specific organs and body systems, such as respiratory diseases (pneumonia, bronchial asthma, and other non-specific lung diseases) and cardiovascular diseases (hypertension, myocardial infarction, chronic diseases, etc.).

Undoubtedly, the most dangerous atmospheric pollution for human health reduces the body's adaptation capabilities, leading to changes in respiratory functions and an increase in lung pathologies. Additionally, specific pollution is characteristic of areas with industrial plants, which can also have adverse effects on human health. For instance, in areas with intense traffic, chronic poisoning and lung diseases are common. High pollution levels pose a threat not only to the current generation but also to future ones.

Human activities disrupt the balance in nature, leading to the emergence of ecological problems such as the greenhouse effect, ozone depletion in the atmosphere, smog, acid rain, and atmospheric pollution. Air pollution is no longer just a problem of a single country; it is a problem of every city and every individual. We cannot ignore the gradual deterioration of air quality and the negative impact of various harmful pollutants on the human body. Therefore, I consider the topic of atmospheric pollution to be relevant. I am interested in researching the level of harmful emissions in Boyarka in relation to the amount of automobile transport, investigating the negative impact of gas pollutants on the surrounding environment, and calculating the amount of clean air required to dissolve harmful substances to ensure sanitary-acceptable living conditions for humans [2].

Literature review. The main reason for the deterioration of the ecological state of cities is the imperfect planning and placement of industrial enterprises in residential areas, resulting in air pollution from emissions of stationary and mobile sources, as well as low green coverage and noise pollution. The increasing number of

automobiles in recent decades has a particularly hazardous impact on the atmospheric air quality of cities (M.O. Klymenko, Y.O. Molchak, T.L. Melikhova, 2001). Technogenic pressure on the state of atmospheric air in cities contributes to the increase in population morbidity, primarily caused by air pollution from pollutants such as dust, carbon (II) oxide, sulfur (IV) oxide, and nitrogen (IV) oxide. The lack of monitoring the spread of diseases in specific parts of the city makes it impossible to establish a connection between the level of morbidity and the pollution status, and therefore to zone the city's territory based on environmental risks, especially in small cities. Thus, there is a need for a detailed assessment of the ecological situation and the state of atmospheric air in cities. Currently, conducting instrumental monitoring across the entire territory of the city of Zhytomyr is not feasible as it requires significant financial resources, time, and qualified personnel. Research (I.M. Shvadchak, A.I. Horova, A.I. Kurninny, A. Mekhandzhiev, L.V. Chastokolenko, M. Miller, W.F. Grant, E.T. Owens) indicates the possibility of evaluating the ecological state of the city's atmospheric air using bioindication methods, particularly lichen indication. This involves using the values of bioindicator plant indicators and assessing the territory based on an evaluation scale that characterizes the condition of the surrounding environment according to the indicators of plant damage [3].

Aims. The purpose of the article is to identify negative factors that affect the worsening of the environmental situation in the country and individual regions. The main task of my work is the analysis of negative changes in the ecological state of Boyarka and advocacy of possible ways to improve the ecological situation in the city. This study also shows the importance of chemistry as a science in the understanding and development of current environmental problems of our time. In practice, this work can be evaluated in lessons, seminars [4].

Methodology. On the basis of a systemic approach, the tasks of creating ecologically safe living conditions for the population of suburban areas of the city were solved by conducting noise protection measures. Experimental studies were carried out using modern acoustic measuring devices "Octava-101" and "Ekofizika-Octava". Data processing involved the use of mathematical statistical methods. Mathematical and statistical methods were used to assess the reliability of experimental results.

Results. In the modern world, it is impossible to preserve a stable atmospheric composition, and consequently, the chemical composition of the air. The atmospheric envelope contains a significant amount of undesirable impurities. The cleanest atmosphere is located above the ocean surface and at high altitudes in mountains, while the most polluted air is often near sources of natural or human origin. Additionally, atmospheric pollution can be categorized based on its origin as natural or anthropogenic, based on its chemical dispersion into gaseous and aerosol forms, and based on its effects on organisms, the environment, and material valuables as either positive or negative.

Natural sources of atmospheric pollution include dust storms, volcanic eruptions, cosmic dust, and similar phenomena. About three-quarters of the products of natural atmospheric pollution consist of inorganic substances. These products arise

from the weathering of rocks, particles from soils, ashes, salts, hydrocarbon alcohols, organic acids, ethers, aldehydes, and more [5].

Artificial pollution of the atmosphere is the result of industrial activities, transportation emissions, and the disposal of household waste. Major sources of artificial atmospheric pollution also include facilities in the municipal sector and agricultural practices. Atmospheric pollutants can be categorized into primary pollutants, which are directly emitted into the atmosphere, and secondary pollutants, which are formed as a result of the transformation of primary pollutants. For instance, sulfur dioxide undergoes oxidation to form sulfur trioxide, which, in the presence of water vapor, further reacts to produce sulfuric acid. Similarly, through chemical, photochemical, and physicochemical reactions between pollutants and atmospheric components, secondary pollutants are formed.

The atmosphere is polluted as a result of various factors, including industrial activities, household heating systems, transportation, and more. Among the industrial sectors, the primary sources of atmospheric pollution are the power generation industry (27%), metallurgy (26%), and the construction industry (13%). Thermal power plants, metallurgical, and chemical facilities, as well as boiler installations, consume approximately 70% of solid and liquid fuels extracted annually. Their activities result in the emission of harmful gases into the atmosphere.

The most common harmful gas pollutants include: sulfur oxides (IV and VI) - SO_2, SO_3; hydrogen sulfide (H_2S); carbon disulfide (CS_2); nitrogen oxides - NO_x; benzopyrene; ammonia; chlorine compounds; fluorine compounds; hydrogen sulfide; hydrocarbons; synthetic surfactants; carcinogens; heavy metals; carbon oxides (II and IV) - CO, CO_2.

So we will consider some of them.

Carbon dioxide (CO_2) is a byproduct of fuel combustion, with over 2 billion tons being released into the atmosphere annually. It is not harmful to the human body and is commonly used for domestic and industrial purposes. However, carbon dioxide poses a significant danger as it contributes to the greenhouse effect by trapping heat radiation in the lower atmosphere. This property of carbon dioxide in the atmosphere is known as the greenhouse or greenhouse effect.

Carbon monoxide (CO) is produced during incomplete combustion of carbon-containing substances. It enters the air through the burning of solid waste, exhaust gases, and emissions from industrial facilities. Annually, at least 250 million tons of this gas are released into the atmosphere. Carbon monoxide is odorless, colorless, and tasteless. It is a compound that actively reacts with components of the atmosphere, contributing to an increase in the planet's temperature and the creation of the greenhouse effect.[6].

Sulfur dioxide (SO_2) is released during the combustion of coal, processing of sulfur-containing ores (up to 70 million tons per year), and burning of sulfur-rich fuels, among other sources. The annual emissions into the atmosphere amount to approximately 200 million tons. Sulfur dioxide undergoes oxidation through photochemical and catalytic reactions, forming aerosols or dissolving in rainwater,

which then acidifies soils and water bodies, accelerates metal corrosion, and exacerbates respiratory illnesses in humans.

Sulfuric anhydride is formed through the oxidation of sulfur dioxide. The final product of this reaction is an aerosol or a solution of sulfuric acid in rainwater, which acidifies the soil and exacerbates respiratory illnesses in humans. The deposition of sulfuric acid aerosol from the smokestacks of chemical plants is observed during periods of low cloudiness and high humidity in the air. The leaves of plants growing within a distance of less than 1 km from such plants are often densely covered with small non-necrotic spots formed by the deposition of sulfuric acid droplets. Pyrometallurgical plants in non-ferrous and ferrous metallurgy, as well as thermal power plants, annually release tens of millions of tons of sulfuric anhydride into the atmosphere.

Hydrogen sulfide and carbon disulfide are released into the atmosphere separately or together with other sulfur compounds. The main sources of emission are industrial facilities involved in the production of synthetic fibers, sugar, coke-chemical, oil refineries, and oil fields. In the atmosphere, they slowly oxidize to form sulfuric anhydride.

Nitrogen oxides are formed during fuel combustion, fertilizer production, acid and viscose silk manufacturing, and celluloid production. The main sources of emission are plants that produce nitrogen fertilizers, nitric acid, nitrates, aniline dyes, nitro compounds, viscose silk, and celluloid. Approximately 20 million tons of nitrogen-containing compounds are emitted into the atmosphere annually from industrial sources.

Chlorine compounds are released into the atmosphere from chemical industry plants, pesticide production, organic dyes, hydrolysis alcohol, soda, and hydrochloric acid. In the atmosphere, they are observed as impurities in chlorine molecules and hydrogen chloride vapors. The toxicity of chlorine is determined by the type of compounds and their concentration.

Fluorine compounds are released into the atmosphere by plants involved in aluminum, steel, enamel, glass, ceramics, and phosphorus fertilizer production. Fluorine-containing substances enter the atmosphere in the form of gaseous compounds like hydrogen fluoride or sodium and calcium fluoride dust. Fluorine derivatives are strong insecticides and exhibit highly toxic effects. Excessive concentrations of fluorine compounds in feed cause chronic intoxication in animals known as fluorosis. Insects are highly sensitive to fluorine compounds.

Metallurgical industry, during iron smelting and processing to steel, releases various heavy metals and toxic gases into the atmosphere. For example, for every 1 ton of pig iron produced, about 2.7 kg of sulfur dioxide and 4.5 kg of dust particles consisting of arsenic, phosphorus, antimony, lead, mercury vapor, and rare metals, as well as resinous substances like hydrogen cyanide, are emitted.

There are various types of pollution: chemical, automobile emissions, aerosol, hydrocarbon, radiation, noise, and electromagnetic pollution. However, pollution from chemical transformations has the most significant impact on the environment. Chemical pollutants include solid, gaseous, and liquid substances, as well as chemical

elements and artificial compounds that enter the biosphere and disrupt natural cycles of matter and energy.

Emissions and leaks of hazardous chemical substances, burning of various materials, equipment, construction, accidents during transportation of hazardous chemicals, explosive, and flammable cargoes result in environmental pollution. Chemical accidents are very dangerous because chemical emissions can spread over large areas, leading to significant pollution of the environment. Among the hazardous gaseous compounds that pollute the atmosphere and pose risks to human health are Cl_2, HCl, HF, HCN, SO_3, SO_2, CS_2, CO, CO_2, NH_3, $COCl_2$, nitrogen oxides, and others.

Transport vehicles of all kinds are an important source of atmospheric pollution. Automobile emissions consist of a mixture of about 200 substances, including aldehydes with a pungent odor and strong irritant properties, as well as carcinogenic substances that can cause cancer and other illnesses [8].

On average, a typical automobile consumes approximately 4.35 tons of oxygen and emits 3.25 tons of carbon dioxide, 0.53 kg of carbon monoxide, 0.093 tons of hydrocarbons, and 0.027 tons of nitrogen oxides per year. By the end of the 20th century, there were about 1 billion automobiles worldwide.

Automobile transportation primarily contributes to atmospheric pollution through three main channels:

Exhaust gases released through the tailpipe.

Crankcase emissions. Hydrocarbon emissions due to fuel evaporation from the tank, carburetor, and pipelines.

Among the exhaust gases of automobiles, the most significant volumetric weights include carbon monoxide (0.5-10%), nitrogen oxides (up to 0.8%), unburned hydrocarbons (0.2-3%), aldehydes (up to 0.2%), and soot.

In absolute quantities, for every 1000 liters of fuel consumed by a carburetor engine, the emissions include 200 kg of carbon monoxide, 25 kg of hydrocarbons, 20 kg of nitrogen, 1 kg of particulates, and 1 kg of sulfur compounds.

The accumulation of carbon dioxide in the atmosphere is also having a negative impact, and unfortunately, its quantity is increasing. This may lead to an increase in the average annual temperature on Earth in the near future.

In rural areas, the main sources of air pollution are livestock farms, poultry complexes, agrochemical warehouses, storage facilities for treated seeds, and fields treated with pesticides and mineral fertilizers [9].

Aerosol pollution is also considered one of the atmospheric pollutants. Aerosols are solid or liquid microscopic particles suspended in the atmosphere. Solid components of anthropogenic aerosols include products from thermal power plants, enrichment plants, metallurgical, magnesite, cement, and soot plants.

These solid components of aerosols are highly hazardous to living organisms, causing specific diseases in humans. Aerosols can be classified as passive or active, depending on their impact on the human body. Passive aerosols accumulate on the respiratory system's walls and can cause various illnesses at certain concentrations.

On the other hand, active aerosols can enter the bloodstream, making them more dangerous as they can lead to diverse diseases by entering human cells.

One of the most prominent representatives of aerosol pollution in the atmosphere is organic dust, containing aliphatic and aromatic hydrocarbons and acid salts. It is formed during the combustion of residual oil products and in processes like pyrolysis in refineries, petrochemical, and similar facilities.

Aerosol pollution in the atmosphere can also manifest as smoke, fog, haze, or smog under certain weather conditions. Smog, in particular, is highly hazardous to the respiratory and circulatory systems.

Radiation contamination is another specific atmospheric pollutant caused by radioactive aerosols entering the atmosphere due to nuclear explosions, accidents in nuclear facilities, disposal, and recycling of spent nuclear fuel, or military conflicts. Subsequently, atmospheric radiation is absorbed into the soil, water solutions, and living organisms, causing cancer and genetic damage in humans.

Noise pollution in the atmosphere is a form of wave-related, physical pollution that the human body cannot adapt to. The intensity of noise pollution (pressure) is measured in decibels (dB). Noise levels between 30-80 dB do not harm the human body. However, noise intensities of 85 dB and above can lead to physiological and psychological negative effects on the nervous system, sleep, emotions, and work capacity [10].

Electromagnetic pollution is particularly noticeable in urban settlements, where the level of electromagnetic fields is hundreds of times higher than natural fields. An electromagnetic field intensity of 1000 V/m can have adverse effects on the human body, resulting in disruptions to the nervous system, endocrine system, and metabolic processes.

Throughout its existence, humanity has been closely connected with nature. However, since the emergence of highly industrialized societies, we have increasingly interfered with its functioning. At the current stage, this interference threatens the complete destruction of nature. Non-renewable resources are constantly being depleted, and the number of arable lands is drastically reduced due to the construction of new cities and industrial plants. Humans have started to interfere with the functioning of the biosphere, the part of our planet where life exists. Additionally, the atmospheric ecological condition has significantly deteriorated, leading to changes in air composition and the emergence of various diseases caused by harmful substances in the air we breathe.

The atmospheric air in populated areas is constantly polluted, and it differs fundamentally from clean, natural air that stimulates biological processes. People living in areas with highly polluted air experience changes in their immune status. For drivers and bus passengers, their cognitive and physical performance is affected.

Air pollution can have both local and general effects on the human body. Local effects can lead to acute respiratory and lung diseases. General effects mainly affect metabolic processes. Often, general effects are preceded by local effects, so they should always be considered together. Some diseases related to air pollution are typical metabolic disorders caused by air pollutants.

The most prevalent harmful air pollutant is carbon monoxide (CO). Inhaling this gas leads to rapid fatigue, headaches, dizziness, sleep disturbances, mood instability, memory impairment, and disruptions in the cardiovascular system and other organ systems. Carbon monoxide II forms a stable compound with hemoglobin in the blood, called carboxyhemoglobin, which blocks oxygen transport in the body.

The concentration of benzopyrene in the air has a direct link with lung cancer mortality. Generally, the mortality rate from lung cancer among urban dwellers is twice that of rural inhabitants. Besides benzopyrene, molybdenum, arsenic, zinc, vanadium, and cadmium contribute to the occurrence of lung cancer. In gas-polluted areas, ten times more people die from lung cancer compared to remote suburbs. Lead is also present in vehicle exhaust gases, and the amount found in the blood of drivers and passengers is harmful to health. The higher the lead concentration in the air, the more it accumulates in the blood, leading to a decrease in enzyme activity involved in oxygen saturation of the blood and metabolic disorders in the body.

In cities, the number of cases of conjunctivitis, eczema, pharyngitis, and laryngitis increases due to air pollution from carbon oxides, nitrogen oxides, ammonia, hydrocarbons, sulfur dioxide, formaldehyde, fluorides, sulfuric acid aerosols, surface-active substances, etc. These pollutants cause poisoning and reduce the immune properties of the body [11].

Nitrogen oxides cause irritation of the upper respiratory tract mucous membranes, and in severe cases, it can lead to death due to lung edema. Incidences of pneumonia, myocardial infarction, and allergic diseases, including bronchial asthma, are also associated with air pollution. The negative impact of environmental factors on the human body can manifest as inflammation, dystrophic changes, allergic conditions, developmental impairments in fetuses, and damage to the cell's genetic apparatus. Approximately 70-80% of all cancer cases are caused by exposure to chemical carcinogens. Currently, about 4% of newborns already exhibit genetic defects that can lead to significant hereditary diseases.

Air pollution contributes to an increased prevalence of inflammatory diseases of the respiratory system and eyes, cardiovascular diseases, infectious diseases, and lung cancer. People residing in areas with significant atmospheric emissions often have low body weight, physical development levels, and functional deviations in the cardiovascular and respiratory systems. The morbidity rate of respiratory diseases accounts for an average of 73.5% of the total morbidity.

Due to the scientific and technological revolution and urbanization of our planet, the environment is steadily deteriorating under the impact of anthropogenic activities that subject it to increasing physical, chemical, and biological loads. Humans are no longer able to adapt to these rapid and global changes. Furthermore, the problem of a demographic explosion and the limitation of natural resources and living space on Earth has emerged.

As a result of the catastrophic deterioration of the environment, the overall health level of the Ukrainian population has sharply declined in recent years. Mortality rates have exceeded birth rates, and genetic processes have been disrupted, leading to an increase in births of children with various hereditary diseases by 2-4

times. Ukraine ranks first globally in terms of child mortality rates. Life expectancy has decreased by 6 years, and the rate of primary disability has increased [12].

The increased air pollution has led to a significant rise in the incidence of cardiovascular diseases, especially myocardial infarction and ischemic heart disease, cerebrovascular diseases, cancer, bronchial asthma, diabetes mellitus, allergic diseases, and gastrointestinal disorders.

Discussion. Based on the research conducted on two sections of the roadway in Boyarka, it was found that automobiles are the main air polluters in the selected areas. The number of vehicles is increasing over time, posing a growing threat to the environment.

Among different types of vehicles, passenger cars contribute the most to harmful emissions, accounting for nearly half of the total emissions released into the atmosphere.

The level of air pollution varies depending on the traffic load on the streets. The main road, Vulytsia Bilohorodska, being the primary transportation artery of the city, has the highest number of vehicles. On the other hand, Vulytsia B. Khmelnytskoho, though not as large in size, has approximately four times less traffic.

During the research period, the amount of harmful emissions into the atmosphere increased. On Vulytsia Bilohorodska, it rose by an average of 3.7%, and on Vulytsia B. Khmelnytskoho, it increased by an average of 5.4%. The rise in the number of passenger cars on Vulytsia B. Khmelnytskoho during the study period contributed to the increased volume of air required to dilute harmful substances, thus ensuring acceptable environmental conditions.

Another well-known method to assess air pollution is by observing the same-sized lichens of a specific species (such as Parmelia, Cetraria, Cladonia, etc.) on tree trunks [13].

It is known that lichens are highly sensitive to air pollution, especially sulfur dioxide gas, which at concentrations of 0.08-0.1 mg/m3 suppresses most lichens, and at a concentration of 0.5 mg/m3 is harmful to virtually all species. It has been observed that with increased air pollution levels, foliose lichens disappear first, then fruticose lichens, and finally, the most resistant species - crustose lichens. Based on these observations, lichen zones can be identified, which provide insights into the degree of air pollution.

For the investigation of air pollution based on changes in the sizes, shapes, and colors of lichens, a territory bounded by Bilohorodska Street and Bohdan Khmelnytskyi Street was selected.

Observations were conducted at a distance of 800 meters from the intersection of the chosen streets, with regular intervals, and as close as possible to the roadways.

During the study, the presence of lichens on the territory was examined, and photographs were taken, which clearly demonstrate the differences in their size, color, and shape (Appendices 1-3).

All trees located closest to the roadways completely lack lichens (Appendix 1). This indicates that this area is polluted with harmful emissions, making it inhospitable for lichens. Lichens serve as indicators of clean air, and the absence of

lichens entirely suggests that the roadway area in the city of Boyarka is extremely hazardous and unfavorable.

At a short distance from the road (10-20 meters), lichens start to appear, but their quantity is limited, and the most resilient forms are crustose lichens (Appendix 2). They have a gray-green color, smaller in size and height. On this territory, the variety of lichen forms cannot be observed, as foliose lichens are absent entirely. This absence is attributed to the close proximity to the road and exposure to automotive emissions from the roadways. The high concentration of harmful gas pollutants directly affects the composition of the air and prevents the growth of less sulfur dioxide-resistant lichen forms [14].

In less polluted areas, located at a greater distance from the roads (beyond 20 meters), different forms of lichens appear, and their quantity, variety of forms, and vegetation density increase. Only in the forest park near the stadium can almost all species of lichens with diverse shapes, colors, and appearances be found. However, even in such unpolluted places like the park, foliose lichens are absent, and fruticose forms are scarce compared to crustose lichens (Appendix 3). This illustrates the ability of the natural environment to self-regulate. The trees in the forest park are currently capable of absorbing the level of harmful emissions into the air and restoring the city's air balance.

Based on the observations, three pollution zones can be identified:

1. Lichen desert - complete absence of lichens, the most unfavorable areas near the roadways.

2. Competition zone - poor lichen flora.

3. Normal zone - peripheral parts of the city, parks, and forest parks.

As a result of this study, a map outlining the air pollution zones was created (Appendix 4). The conclusions drawn from the research provide evidence of the correlation between the existence of lichen flora and the cleanliness of the air and the quantity of gas emissions pollutants.

Automotive emissions directly influence the presence and size of lichens in the city. As the number of vehicles increases, the amount of harmful gas emissions into the air also rises. This relationship was observed in the previous study. The pollution is reflected in the lichen population in the form of reduced size, quantity, and height, disappearance of foliose forms, and decreased fruticose forms. The presence of park and forest park zones significantly affects the ecological environment. Where streets are bordered by densely planted trees, the lichen desert zone is almost absent. This is characteristic of Bohdan Khmelnytskyi Street. Conversely, the lichen desert along Bilohorodska Street exists and has considerable dimensions.

Our city faces a severe air pollution problem, primarily due to the increasing number of vehicles. It can be confidently said that this problem affects every city resident.

To address this issue, the reduction of harmful emissions from vehicles is necessary. This can be achieved through:

1. Installing catalytic converters on engines to neutralize exhaust gases.

2. Switching to gas mixtures as an alternative fuel.

3. Implementing energy-saving technologies.

4. Reducing the number of automobiles on the road.

5. Transitioning to alternative fuel sources.

6. Increasing the number of green spaces, parks, and forested areas both within the city and its surroundings.

7. Prohibiting the indiscriminate felling of trees in and around the city [15].

Conclusion. The possibilities of human impact on nature are constantly growing and have already reached a level where humans can destroy the planet, annihilate all living beings, and completely alter climatic conditions. The Earth's atmospheric envelope is one of the most crucial conditions for life. Without food, a person can survive for a month; without water, a week; but without air, only a few minutes.

The atmosphere has great ecological significance. It protects living organisms from harmful cosmic radiation and meteorite impacts, and serves as a carrier of heat and moisture. Through the atmosphere, photosynthesis and the exchange of energy and information take place - fundamental processes in the biosphere. The presence of the atmosphere on the planet determines a series of complex exogenous processes such as the weathering of rocks, the movement of air masses, and natural water activities. For some organisms like bacteria, flying insects, birds, and others, the atmosphere is their primary living environment.

The development of automotive transport has led to the pollution of the atmosphere in cities and transport routes with heavy metals and toxic hydrocarbons. The widespread use of mineral fertilizers and chemical plant protection agents has resulted in the presence of chemical pollutants in the atmosphere, soils, and natural waters, contaminating bodies of water, watercourses, and agricultural products with harmful elements like nitrates and pesticides. The operation of chemical plants and thermal power stations also generates massive amounts of solid waste (residue, slag, ashes), which is deposited on large areas and has a negative impact on the atmosphere, surface and underground waters, and soil cover (due to dust generation, gas emissions, etc.). Within Ukraine's territory, there are 877 chemically hazardous objects and 287,000 objects that use highly toxic substances or their derivatives in production processes (located in 140 cities and 46 settlements).

Human activities disrupt the balance in nature, leading to the emergence of ecological problems. Among them, we can mention the greenhouse effect, ozone holes in the atmosphere, smog, acid rain, air pollution, and more. The problem of air pollution is no longer confined to individual countries; it is a problem faced by every city and every individual. We cannot ignore the gradual deterioration of the chemical composition of the air and the negative impact of various harmful pollutants on our bodies.

Achieving the desired air purity can only be accomplished through a comprehensive approach that involves legislative, technological, planning, and sanitary measures implemented at the state level, requiring significant financial and material resources. However, an essential role in this endeavor is also played by raising the cultural level and awareness of the population in Ukraine. Effective means of preserving the cleanliness of the atmospheric air include replacing harmful

substances in industrial processes with less toxic alternatives, creating new closed-loop technological lines that operate without emissions into the atmosphere, practicing waste-free utilization of natural resources, and implementing efficient filtering systems.

The problem of reducing air pollution can be solved only in close cooperation of public organizations and state institutions, and on a global scale - only on the basis of international cooperation and joint efforts of all countries.

Among the system of measures aimed at preventing atmospheric pollution, several main groups are distinguished: the first group includes measures aimed at reducing gross emissions of pollutants into the atmosphere. These are measures of a technical, economic and legal nature: improvement of technological processes of industrial enterprises; focus on environmentally safe sources of electricity production (wind, solar, tidal, hydropower plants); improvement of fuel carburetion, transition of vehicles to environmentally safe types of fuel.

In order to protect the atmospheric air from pollution by motor vehicles, the planning and development of urban settlements are of great importance. In particular, greening of highways, zoning of residential areas, creation of multi-level traffic junctions, ring roads, use of underground space for parking lots, garages, creation of expressways, sanitary protection zones.

Measures of an economic nature aimed at reducing emissions into the atmosphere include: establishment of economic sanctions (fees for emissions, fees for excessive emissions, fines for causing damage to the environment); formation of ecological exchanges, within which it is possible to buy or sell the right to additional emissions of pollutants into the atmosphere; development of measures to stimulate the introduction of new technological processes.

A group of measures of a legal nature is represented by legislative acts on the protection and use of atmospheric air. These include the UN international convention on climate change, as well as a number of state-level legislative acts: the Law of Ukraine "On Atmospheric Air", Regulations on the Procedure for Issuing Permits for Emissions of Pollutants into the Atmosphere (Decree of the CM of Ukraine), Instructions on the Procedure for Development, Installation, and Review and proving the limits of emissions of polluting substances into the atmospheric air (Order of the Ministry of Safety and Security of Ukraine).

The second group of measures consists of those aimed at reducing the concentration of pollutants in the boundaries of industrial nodes, centers, and agglomerations. They include measures for planning the dispersion and deconcentration of harmful industries on the territory [16].

The third group of measures to prevent atmospheric pollution includes environmental education and environmental education. The formation of the components of the ecological culture of the population allows to regulate household pollution of the air environment, to relate with understanding to the introduction of air cleaning measures in workplaces, institutions, organizations and enterprises.

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