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### **Alexander Shevchenko**

*MD, Master of Medicine, Pedagogy & Economics, PhD student in Ukrainian Engineering Pedagogics Academy  
University str., 16, Kharkiv, Ukraine, 61003  
Director of the  
Kharkiv Regional Institute of Public Health Services  
Rymarska str., 8, Kharkiv, Ukraine, 61057  
al.shevchenko1976@gmail.com ORCID 0000-0002-4291-3882*

### **Serhii Kucherenko**

*Candidate of Psychological Sciences, Associate Professor,  
Associate Professor of the Department of Psychology  
of Activity in Special Conditions of the  
National University of Civil Defense of Ukraine  
Chernyshevska str., 94, Kharkiv, Ukraine, 61023  
smksmk5858@gmail.com ORCID 0000-0002-2209-9430*

### **Anatolii Komysan**

*Candidate of Pedagogical Sciences, Senior Researcher,  
Associate Professor of Pedagogy Department of Psychology Faculty of the  
V.N. Karazin Kharkiv National University  
Svobody sq., 6, Kharkiv, Ukraine, 61022  
anatole.kom@gmail.com ORCID 0000-0001-7644-4976*

### **Valentina Shevchenko**

*Doctor of Technical Sciences, Associate Professor,  
Professor of the Department of Electrical Machines of the  
National Technical University "Kharkiv Polytechnic Institute"  
Kirpychova str., 2, Kharkiv, Ukraine, 61002  
zurbagan8454@gmail.com ORCID 0000-0002-9557-9849*

### **Nataliia Kucherenko**

*Candidate of Psychological Sciences (PhD),  
Associate Professor of Practical Psychology Department of the  
Ukrainian Engineering Pedagogics Academy  
University str., 16, Kharkiv, Ukraine, 61003  
natalyakucherenko1989@gmail.com ORCID 0000-0002-6644-3117*

## **FORMATION OF VALEOLOGICAL COMPETENCE IN CONDITIONS OF CLASSROOM AND DISTANCE LEARNING**

Formulation of the problem. The article considers the problem of valeological (health saving) competence formation in non-medical students. Health saving competencies are based on a healthy lifestyle, safe behavior practices and the ability to provide emergency pre-hospital care to victims in critical situations. The formation of valeological competence in non-medical takes place during the study of valeological disciplines (including "Fundamentals of Medical Knowledge", "Health Pedagogy" and others) in higher education institutions (HEI). Since the spring of 2019, the teaching of these disciplines is forced to take place in distance form.

The purpose of the article. To compare the formation of valeological competence in students of the same educational level who were trained in a standardized valeological program in conditions of classroom and distance learning.

Research methods. The study used methods: qualimetric and expert assessments – to form a factor-criterion model of valeological competence, pedagogical experiment and mathematical statistics – to calculate and compare the results of the formation of valeological competence, randomization – to form comparison groups.

The main results of the study. It is established that valeological competence and the vast majority of its components (13/14) are better formed during classroom training. Thus, a high level of competence (75–100%) was reached by 14.4% of students who studied in the classroom form (offline), and only 10.1% of students who studied in the distance form (online). Possible reasons for this difference are the need to conduct classroom classes (trainings, role-playing games, emergency training) and higher initial level of knowledge of human anatomy and physiology in students who have undergone classroom training.

Conclusions. It is concluded that it is necessary to return to classroom learning after the end of the COVID-19 pandemic in the world and the war in Ukraine for more successful formation of valeological competence in non-medical students.

**Keywords:** health saving, «Health Pedagogy», «Fundamentals of Medical Knowledge», qualimetric model, factor-criterion analysis.

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**Research problem and its connection with important scientific or practical tasks.** The need for health care is widely recognized by Ukrainian society and the state. Health care is guaranteed by the Constitution, regulated by the Law of Ukraine “Fundamentals of the Legislation of Ukraine on Health Care” [6], provided by targeted national and regional programs in the field of health and social protection. Health is a personal and social value [2]. Its preservation and restoration is 50% dependent on human lifestyle, 20% on environmental factors, 20% on heredity, another 10% – on the state of the health care system [20]. Therefore, it is prevention, not disease, that is most important for good health.

Disease prevention is carried out by the joint efforts of medical and social workers, teachers, politicians and public figures. The educational environment is the most suitable for the systematic formation of health saving (valeological) competence. In most Ukrainian higher education standards [3] health saving is referred to special (professional, subject) competencies, and therefore should be formed through a special (valeological) discipline “Fundamentals of Medical Knowledge”, “Fundamentals of Life Safety”, “Occupational Safety”, “Health Pedagogy”, etc.). Despite the high variability of valeological disciplines, which should facilitate convenient adaptation to the needs of different specialties, it should be noted the inconsistent introduction of valeological education in the curricula of higher education institutions (HEI) of Ukraine [18].

**Analysis of recent research and publications.** Valeology (from the Latin *valeo* – to be healthy, strong) is part of preventive medicine, but

due to the use of this name for a number of pseudo-scientific areas of recovery, the reputation of this term is damaged. In the regulations of Ukraine, the relevant competence is called “health saving competence”, which is part of the “health saving culture”. The terms “valeological competence” and “valeological culture” are more characteristic of the scientific literature [6; 18; 20].

There are different understandings of valeological competence. Thus, Yasynskiy V. and Zhydetskiy Yu. believe [6] that it is “a component of life competence, which is manifested in knowledge, values and motives, valeological position, activities for recovery...”. Pishchulin V. believes that to form the valeological competence of a university graduate means to have knowledge and skills for a healthy lifestyle [4, p. 26]. Voronin D. considers valeological competence “a dynamic personality trait to be able to organize and regulate their activities, evaluate their behavior, actions of others, adhere to their own beliefs, moral norms and principles against the action of external forces [19]. Yu. Boychuk describes the process of formation of valeological competence as complex, gradual, continuous, aimed at acquiring knowledge, developing abilities, forming stable motivation, beliefs, willpower against the background of a positive emotional attitude to the goal of learning [1]. According to Shtefan L. and Shevchenko A., to form valeological competence means to teach a healthy lifestyle, safe behavior practice and provide emergency pre-hospital care to victims in critical conditions [18]. Behavior that does not increase the likelihood of mechanical injuries, burns, frostbite,

electric shock, radiation, poisoning above the statistical level of accidents is considered safe. Dangerous behaviors discussed in the study of valeological disciplines include chemical addiction (tobacco smoking, drug and toxic substance use, alcohol abuse), unsafe sex (ignoring barrier contraception, frequent changes of sexual partners), sports injuries (in sports of high achievements, achievements, extreme sports, neglect of safety), domestic injuries (non-ergonomics of premises), occupational injuries (when working with moving machinery, neglect of safety, lack of personal protective equipment), road traffic injuries (neglect of traffic rules, traffic management means in a state of fatigue, intoxication, in bad weather and lighting, driving faulty vehicles), violence (criminal, military, domestic), poisoning (food, drug, carbon monoxide, methyl alcohol, contact with poisonous plants and animals), irradiation (when using nuclear weapons, staying in areas contaminated with radioactive nuclides, premises, consumption of contaminated food and water, medical procedures and frequent long flights), being in a state of severe prolonged stress (in conflicts, being in a combat zone).

The definition of a healthy lifestyle also includes the mandatory renunciation of addictive psychoactive substances, vaccination according to the national vaccination schedule, harmony of relationships with the outside world, the renunciation of unnecessary risks not related to professional responsibilities. Thus, Yasynskiy V. and Zhydetskiy Yu. define a healthy lifestyle as a typical form of life, as well as "traditions, habits, actions, stereotypes, certain restrictions aimed at improving health, achieving optimal quality of life and reducing the risk of disease, which is achieved harmonious combination of work and rest, adequate physical activity, optimal nutrition, hygiene, absence of bad habits, ... friendly attitude to others and to life in general in all its manifestations, i.e. a positive life attitude" [7].

Adherence to the principles of a healthy lifestyle by the majority of citizens lays the foundation for population health and determines the prospects for the existence of the nation [9; 15–17]. The long process of forming a healthy lifestyle among students in Ukraine is mainly through distance (online) learning since 2019 [8; 10; 14], due

to the declared global pandemic COVID-19 and the war with the Russian Federation. Until 2019, similar work took place in the form of classroom (offline) training. There is a natural scientific interest in comparing the formation of valeological competence in conditions of classroom and distance learning.

**Purpose and objectives.** To compare the formation of valeological competence in students of the same educational level who were trained in a standardized valeological program in conditions of classroom and distance learning. To achieve the goal of the study it is necessary:

a) determine the required minimum number of students to form comparison groups and randomize them;

b) prove the compliance of training programs for distance and classroom learning;

c) compare the levels of formation of valeological competence according to the qualimetric, factor-criterion model.

**Research methods.** Approximately the same duration periods of classroom and distance learning were selected for the study: 2004–2007 and 2019–2022 (3 academic years each). For comparison, non-medical students of Kharkiv HEIs (V. N. Karazin Kharkiv National University, V. N. Karazin KhNU; National Technical University "Kharkiv Polytechnic Institute", NTU "KhPI"; National University of Civil Defense of Ukraine, NUCDU; Ukrainian Engineering Pedagogics Academy, UIPA) 2–4 courses, equally educational level ("bachelor" or one that corresponded level in 2004–2007). Training took place according to the same program of 14 topics, each of which was allocated 4 academic hours (2 academic hours for lectures, 2 academic hours for practical classes). The "Fundamentals of Medical Knowledge" curriculum for offline higher education students was developed in 2004 by the Kharkiv Regional Institute of Public Health Services (KhRIPHS) with World Health Organization grant support. The program for distance (online) learning was developed at UIPA [5]. From general population of students (3,096) who studied during 6 academic years with "Fundamentals of Medical Knowledge" and "Health Pedagogy" disciplines, 373 students were randomly selected. The minimum number of students for representative sample was determined by the formula [12]:

$$n = \frac{N}{0.0025 \times N + 1} = \frac{3096}{0.0025 \times 3096 + 1} = 354, \quad (1)$$

where  $n$  – minimum size of the representative group;  
 $N$  – volume of the general population.

The comparison groups are approximately the same in terms of the number of students included in them: 194 students underwent classroom

training, 179 distance learning. The distribution of students by years of study, discipline and form of study is presented in Table 1.

Table 1

Students of Kharkiv's higher education institutions, who were selected to compare the level of formation of valeological competence in the conditions of classroom and distance learning in 2004–2007 and 2019–2022

Form of study	classroom (offline)	distance (online)
Years of study	2004–2007	2019–2022
Higher education institutions	V.N. Karazin KhNU, NTU «KhPI», NUCDU	NTU «KhPI», UEPA
Educational level	= bachelor (2–4 courses)	bachelor (2–4 courses)
Valeological discipline	Fundamentals of medical knowledge	Health Pedagogy
Where the curriculum was developed	KhRIPHS	UEPA
Number of studied topics	14	14
Name of comparison groups	auditorium (GA)	distance (GD)
Amount of students representative sample	194	179
	373	

The evaluation of learning outcomes was performed according to Bloom's adapted model [11]. The minimum appropriate level of valeological competence for bachelor's degree students is the "understand" level (2/5), which must be achieved after the "remember and reproduce" level (1/5) [18]. Also to assess the level of competence components formation was used point-interval scale [13], in which the points were:

0% – competence component is not formed ( $CC_0$ );

0.25% – competence component is not formed rather than formed ( $CC_{0.25}$ );

0.5% – competence component is formed in half ( $CC_{0.5}$ );

0.75% – competence component is formed rather than not formed ( $CC_{0.75}$ );

1% – competence component is fully formed ( $CC_1$ );

and intervals were:

0–0.25% – minimum level of competence component formation ( $CC_{0-0.25}$ );

0.25–0.5% – low level of competence component formation ( $CC_{0.25-0.5}$ );

0.5–0.75% – average level of competence component formation ( $CC_{0.5-0.75}$ );

0.75–1% – high level of competence component formation ( $CC_{0.75-1}$ ).

The selection criteria for comparison groups were:

1. study of all 14 topics of the course;

2. the minimum level of competence formation is "understand" (2/5);

3. the minimum level of competence components formation:

3.1.  $CC_{0.25}$  on topics 1 and 11 (Table 2);

3.2.  $CC_{0.5}$  on topics 2–10, 12–14 (Table 2);

4. the initial knowledge level of human anatomy and physiology within the school course is not less than 0.4% of correct answers to test questions.

1,427 students of the general population (3,096) met these criteria.

The factor-criterion (FC) qualimetric model presented in Table 2 was also used. Factors (F) of evaluation were topics (1–14), criterion (C) was the coefficient of conformity determined by the "weight" of each topic. 4 components of valeological competence were assessed by two means: tests (cognitive and activity components) and questionnaires (motivational-value and personal components) on all 14 topics of the disciplines "Fundamentals of Medical Knowledge" and "Health Pedagogy".

Table 2

Qualimetric parameters and means of assessing the formation of valeological competence of students of higher education institutions of Kharkiv in terms of classroom and distance learning in 2004–2007 and 2019–2022

Valeological disciplines topics (criteria, CC)	Evaluation method		Components «weight» (factor)
	Test (knowledge, skills, abilities)	Questionnaire (behavior model)	
1. Health saving in education	2	3	5
2. Rational nutrition	4	5	9
3. Physical culture and sports, mode of work and rest	3	5	8
4. Safe use of medicines	4	2	6
5. Trauma. Domestic violence. Bullying	2	5	7
6. Poisoning, radiation, occupational diseases	4	2	6
7. Emergencies	6	4	10
8. Blood and organ donation	2	4	6
9. Cardiovascular and pulmonary diseases	4	3	7
10. Infectious and parasitic diseases	5	2	7
11. Inclusive education	2	2	4
12. Mental and psychological health. Professional burnout	3	4	7
13. Sex education and family planning	3	3	6
14. Chemical dependencies	6	6	12
Components «weight»	50	50	100

Distance learning was conducted using platforms and software applications Moodle, YouTube, Google Meet, Zoom, Google Forms, Microsoft Office, Telegram, Viber, e-mail.

#### **Presentation of the material and main results**

Formation of student groups to the criteria of study for 2–4 courses of higher education institutions of Kharkiv, training in programs of one educational level (“bachelor” during the study in the classroom and the corresponding “bachelor” level during the distance learning) meets only part of the conditions for correct comparison of learning outcomes (level of formation of valeological competence). Distance learning and distance learning in one curriculum are also a prerequisite for a correct comparison. This condition is also met: 14 identical topics taught by the same teacher were studied. But there is a difference in the use of teaching methods and activities, as shown in Table 3.

The identity of GA and GD curricula is determined primarily by the identity of the topics and the same number of hours of study of each topic. The main forms of education (lectures and practical classes) were also the same. The activities of students during lectures were different: writing notes in the classroom form of learning were actually replaced by the compilation of intelligence maps in distance learning. Innovative forms of learning, such as mnemonics and brainstorming, were equally used. Only GA students had the opportunity to practice emergency care on simulators and other students, visit the Museum of Anatomy and Pathological Anatomy of Kharkiv State Medical University (now Kharkiv National Medical University), participate in trainings and role-playing games (with the roles of patient and physicians, victim and rescuer). The possible difference in valeological competence levels formation could be due to the initial level of student training.

Table 3

Teaching methods used for the valeological competence formation in Kharkiv higher education institutions' students in classroom and distance learning conditions in 2004–2007 and 2019–2022

Teaching methods (activity)	Forms of study (comparison groups)	
	Auditorium (GA)	Distance (GD)
Lectures	+	+
(annotation)	+	-
(intelligence maps compilation)	-	+
Practical training	+	+
(joint discussion)	+	+
(watching videos)	+	+
(first aid methods training)	+	-
(visiting museums of anatomy and pathological anatomy)	+	-
(trainings)	+	-
(role games)	+	-
(mnemonics)	+	+
(brainstorming)	+	+
(testing and questionnaires)	+	+

There was a significant difference in the initial level of knowledge in human anatomy and physiology within the school year in students of the two groups of comparisons. Students who studied in 2004–2007 (GA) provided an average of 63.7% of correct answers to simple questions about human organs, organ systems, and their functions. Students who studied in 2019–2022 (GD) provided 43.2% of the correct answers.

The levels of valeological competence formation in non-medical students after completing

the study of all topics of valeological disciplines through classroom (in 2004–2007) and distance (in 2019–2022) learning were compared using a qualimetric model. Given the different number of students in the comparison groups ( $n_{GA} = 194$ ;  $n_{GD} = 179$ ), the comparison of valeological competence components' formation was conducted in relative units (%). The results of the comparison are presented in Table 4.

Table 4

Levels of formation of valeological competence and its components in Kharkiv higher education institutions' students in conditions of classroom and distance learning in 2004–2007 and 2019–2022 (relative number of students, %)

Competence component (FC model factor, valeological disciplines topics)	Group*	The level of competence component formation, %		
		low (CC <sub>0.25-0.5</sub> )	average (CC <sub>0.5-0.75</sub> )	high (CC <sub>0.75-1</sub> )
1. Health saving in education	GA	15.1	70.6	14.3
	GD	15.8	72.3	11.9
2. Rational nutrition	GA	-	67.3	32.7
	GD	-	65.8	34.2
3. Physical culture and sports, mode of work and rest	GA	-	61.4	38.6
	GD	-	65.5	34.5
4. Safe use of medicines	GA	-	75.5	24.5
	GD	-	77.1	22.9
5. Trauma. Domestic violence. Bullying	GA	-	58.8	41.2
	GD	-	61.5	38.5

Competence component (FC model factor, valeological disciplines topics)	Group*	The level of competence component formation, %		
		low (CC <sub>0.25-0.5</sub> )	average (CC <sub>0.5-0.75</sub> )	high (CC <sub>0.75-1</sub> )
6. Poisoning, radiation, occupational diseases	GA	-	70.2	29.8
	GD	-	75.7	24.3
7. Emergencies	GA	-	67.6	32.4
	GD	-	73.9	26.1
8. Blood and organ donation	GA	-	61.3	38.7
	GD	-	61.9	38.1
9. Cardiovascular and pulmonary diseases	GA	-	73.2	26.8
	GD	-	74.8	25.2
10. Infectious and parasitic diseases	GA	-	73.6	26.4
	GD	-	77.0	23.0
11. Inclusive education	GA	16.3	59.5	40.5
	GD	18.1	63.6	36.4
12. Mental and psychological health. Professional burnout	GA	-	67.0	33.0
	GD	-	72.2	27.8
13. Sex education and family planning	GA	-	72.7	27.3
	GD	-	75.9	24.1
14. Chemical dependencies	GA	-	75.5	24.5
	GD	-	76.6	23.4
1-14. The whole program of disciplines, taking into account the «weight» coefficients	GA	15.2	70.4	14.4
	GD	17.1	72.8	10.1

*Note: the result is rounded to tenths of a percent.*

\* GA – Auditorium Group; GD – Distance Group.

### Conclusions

1. Qualitative assessment of valeological competence formation in non-medical students of the educational level “bachelor” and the corresponding level, who studied under the same program of valeological discipline in Kharkiv HEI in 2004–2007 and 2019–2022, showed that valeological competence and the vast majority of its components are better formed during classroom (offline) learning. Thus, a high level of competence (75–100%) was reached by 14.4% of students who studied in the classroom (offline), and only 10.1% of students who studied in the distance form (online).

2. To determine the objectives of the study, we determined the required minimum of a representative sample of students (354 persons). 373 students were included in two approximately identical comparison groups (194 and 179 persons), which is more than the required minimum. Correspondence of curricula for distance and classroom learning was proved by the criteria of the same educational level (“bachelor” and the corresponding level, 2–4 courses), the same curriculum (14 topics), the

same study time of each topic (4 academic hours, 2 of which – lectures, 2 – for practical classes). Randomization of groups was carried out by pre-targeted selection of 1,427 students from the general population of 3,096 according to the criteria of the required minimum level of valeological competence components formation, and additional random selection of 373 students. All selected students studied in four different non-medical Kharkiv HEI.

3. We do not know other studies with a similar design, so we cannot compare our results with other studies of valeological competence on qualimetric criteria in the classroom and distance learning, but we believe that most existing studies containing comparisons of learning in classroom and distance forms with an emotional conclusion in favor of the latter, unsubstantiated by qualimetric calculations. According to the results of our study, in order to successfully master valeological disciplines for the formation of valeological competence after the end of the COVID-19 pandemic in the world and the war in Ukraine, students should return to the classroom.

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**Олександр Сергійович Шевченко**

магістр медицини, економіки і педагогіки, PhD студент

Українська інженерно-педагогічна академія

вул. Університетська, 16, м. Харків, Україна, 61003

Директор Харківського Регіонального Інституту Проблем Громадської Охорони Здоров'я

вул. Римарська, 8, м. Харків, Україна, 61057

al.shevchenko1976@gmail.com ORCID 0000-0002-4291-3882

**Сергій Михайлович Кучеренко**

кандидат психологічних наук, доцент, доцент кафедри психології діяльності в особливих умовах

Національного університету цивільного захисту України

вул. Чернишевська, 94, м. Харків, Україна, 61023

smksmk5858@gmail.com ORCID 0000-0002-2209-9430

**Анатолій Іванович Комишан**

кандидат педагогічних наук, старший науковий співробітник, доцент кафедри педагогіки

факультету психології Харківського національного університету імені В.Н. Каразіна

Майдан Свободи, 6, Харків, Україна, 61022

anatole.kom@gmail.com ORCID 0000-0001-7644-4976

**Валентина Володимирівна Шевченко**

доктор технічних наук, доцент, професор кафедри електричних машин

Національного технічного університету «Харківський політехнічний інститут»

вул. Кирпичова, 2, м. Харків, Україна, 61002

zurbagan8454@gmail.com ORCID 0000-0002-9557-9849

**Наталія Сергіївна Кучеренко**

кандидат психологічних наук (PhD), доцент кафедри практичної психології

Української інженерно-педагогічної академії

вул. Університетська, 16, м. Харків, Україна, 61003

natalyakucherenko1989@gmail.com ORCID 0000-0002-6644-3117

**ФОРМУВАННЯ ВАЛЕОЛОГІЧНОЇ КОМПЕТЕТНОСТІ В УМОВАХ АУДИТОРНОГО ТА ДИСТАНЦІЙНОГО НАВЧАННЯ**

**Анотація.** *Постановка проблеми.* У статті розглянута проблема формування валеологічної компетентності (компетентності здоров'язбереження) у студентів немедичного профілю навчання. Компетентність здоров'язбереження ґрунтується на здоровому способі життя, практиці безпечної поведінки та вміннях надавати невідкладну долікарняну допомогу постраждалим у критичних ситуаціях. Формування валеологічної компетентності у немедичних закладах вищої освіти відбувається під час вивчення валеологічних дисциплін, зокрема «Основ медичних знань», «Педагогіки здоров'я» та інших. З весни 2019 року викладання цих дисциплін вимушено відбувається у дистанційній формі.

*Мета статті.* Порівняти сформованість валеологічної компетентності у студентів однакового освітнього рівня, які проходили навчання за стандартизованою валеологічною програмою в умовах аудиторного та дистанційного навчання.

*Методи дослідження.* У дослідженні використані методи: кваліметричних та експертних оцінок – для формування факторно-критеріальної моделі валеологічної компетентності, педагогічного експерименту та математичної статистики – для розрахунків та порівняння результатів сформованості валеологічної компетентності, рандомізації – для формування груп порівняння.

*Основні результати дослідження.* Встановлено, що валеологічна компетентність та переважна більшість її компонентів (13/14) краще формуються під час аудиторного навчання. Так, високого рівня сформованості компетентності (75–100 %) досягли 14,4 % студентів, які навчалися в аудиторній формі (оффлайн), та лише 10,1 % студентів, які навчалися в дистанційній формі (онлайн). Можливими причинами такої різниці названі необхідність проводити аудиторні заняття (тренінги, рольові ігри, тренування у проведенні невідкладної допомоги) та вищий вихідний рівень знань з анатомії та фізіології людини у студентів, які проходили аудиторне навчання.

*Висновки.* Зроблено висновок про необхідність повернення до аудиторного навчання після завершення пандемії COVID-19 у світі та війни в Україні для більш успішного формування валеологічної компетентності у студентів немедичного профілю навчання.

*Ключові слова:* здоров'язбереження, «Педагогіка здоров'я», «Основи медичних знань», кваліметрична модель, факторно-критеріальний аналіз.

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