

Ministry of Education of the Republic of Belarus  
Educational Establishment  
“Vitebsk State P.M. Masherov University”

**THE YOUTH OF THE 21st CENTURY:  
EDUCATION, SCIENCE,  
INNOVATIONS**

*Proceedings of IV International Conference  
for Students, Postgraduates  
and Young Scientists*

Vitebsk, December 6, 2017

*Vitebsk  
Vitebsk State P.M. Masherov University  
2017*

UDC [378.147.88+378.4(476.5)](062)  
LBC 74.480.278я431+74.483(4Бен-4Вит)я431  
Y75

Published by the decision of the Research and Methodology Council of the Educational Establishment “Vitebsk State P.M. Masherov University”. Minutes № 1 d/d 19.10.2017.

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**Y75**      **The Youth of the 21st Century: Education, Science, Innovations** : Proceedings of IV International Conference for Students, Postgraduates and Young Scientists, Vitebsk, December 6, 2017 / Vitebsk State University ; Editorial Board: I.M. Prishchepa (Editor in Chief) [and others]. – Vitebsk : Vitebsk State P.M. Masherov University, 2017. – 213 p.  
ISBN 978-985-517-642-9.

The collection of articles includes the Conference proceedings submitted by the authors at the International Conference for Students, Postgraduates and Young Scientists “The Youth of the 21st Century: Education, Science, Innovations” and dedicated to solving current scientific issues in natural sciences, technical sciences and humanities. The articles may be used by scientists, teachers, postgraduates, undergraduates and students of higher educational establishments.

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ISBN 978-985-517-642-9

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# DEVELOPMENT OF THE THEORY OF MATHEMATICAL MODELING AND ITS APPLICATION IN EDUCATION AND INDUSTRY

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## PROGRAM OF FLOW DIAGRAM FOR BOILER INSTALLATION

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Training of specialists at the present stage requires skills in handling computer technologies. The problem of calculation of flow diagram for boiler installation, which is one of the practically-oriented tasks of mathematical training of students of specialty "Information systems and technologies" has been considered. At a certain selection of parameters the developed calculation program makes it possible to increase efficiency of flow diagram, reduce power consumption and firing rate for heating, which is a topical problem in energy policy of the Republic of Belarus.

The aim of the paper is application of fundamental knowledge to the development of practical skills in the area of object-oriented analysis, programming and elements of design in solving practical tasks.

**Material and methods.** The basic thermal scheme of the boiler installation characterizes the essence of the main technological process of energy conversion and use of heat of the working medium in the installation. In developing basic flow diagram for reliable and cost-effective operation the type of the installation (steamer, water-heating and other boiler installations, heat and power plant), type and parameters of heat-carrying agent are determined on the basis of loads and in some cases on technical-economic calculations. Heat efficiency calculation of the designed flow diagram for boiler installation can be done taking into account efficiency factor [1].

**Results and their discussion.** Firing rate for auxiliaries of the boiler installation  $\sum Q_{cb}$  is sometimes 7–17% of the heat supplied to the consumers and depends on the parameters and type of heat-carrying agent; type of heat supply system (open or closed); method of heat-carrying agent heating (steam or hot-water generating units), deaeration system of feed water, amount of condensate returned from consumers as well as on the complexity of the basic flow diagram.

To work out and calculate a flow diagram it is necessary to have the following initial data:

- function of the boiler installation;
- heat-carrying agent;
- type of fuel;
- characteristics of heat supply system;

- amount of heat demands and parameters of the heat-carrying agent;
- amount and portion of the condensate returned;
- temperature of the raw water entering into the boiler installation as well as temperature of the water going to the chemical water treatment (the latter is connected with the quality of the incoming water and the scheme required for its treatment).

On the basis of the above mentioned data the calculation of the basic flow diagram is carried out. It consists of the following stages:

- selection and approximate determination of the parameters of the working medium in the various sections of the flow diagram;
- equating of the material balances for heat-carrying agent and working medium flows;
- developing and solving of the heat balance taking into account losses, starting with external parts of the flow diagram – raw water heaters, feed water, blow expander, etc.;
- calculation of water, steam and other heat-carrying agent consumption required for certain elements of flow diagram – heaters, chemical treatment of water, deaerators, etc. and specification of total heat flow from the boiler installation;
- determination of installation heat efficiency.

**Conclusions.** In this paper calculation of flow diagram program is carried out according to pre-determined values: boiler unit capacity, installation losses on the chemical water treatment, pressure loss in diagram elements.

Furthermore, while making exact calculations it is necessary to take into account pressure drop in steam lines and accessories up to heat exchanger of the boiler installation as well as to the consumers of the process steam which is determined at the minimum load of aggregates.

The results of the work are reported and discussed at the 44<sup>th</sup> Scientific and Technical Students' Conference at Mogilev State University of Food Technologies held on the 18-19<sup>th</sup> of May, 2017. There were given recommendations for further development and working out of the program.

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## THE STUDY OF SEASONAL FLUCTUATIONS OF INVESTMENTS FIXED CAPITAL

I. Beloguzov V. Gichkalov

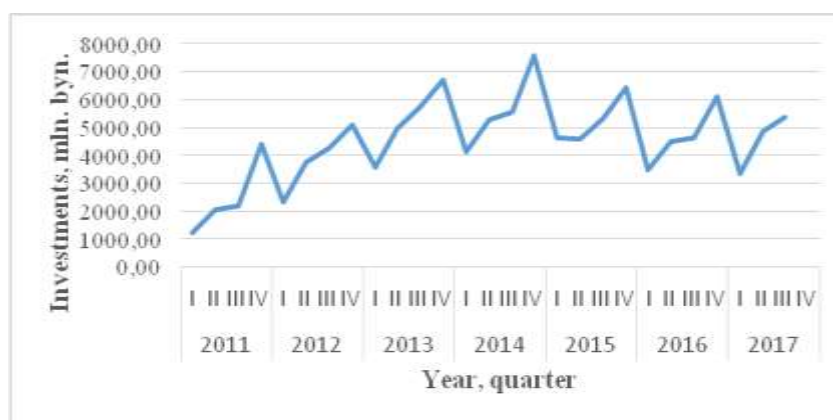
Yanka Kupala State University of Grodno, Grodno, Belarus

Time series usually contain two main elements: the trend and the variability. With the aim of obtaining the most accurate characteristics of the development process and on this basis a more accurate prediction of the studied phenomenon it is necessary to identify and measure not only trends, but also variability, and in particular the seasonal component.

The aim of this study is to identify and measure seasonal fluctuations of investments in fixed capital in the presence of trends and in its absence.

**Material and methods.** For analysis were used quarterly data on fixed capital investments of the Republic of Belarus in 2011-2017 years [1]. We used a method of analytical alignment of the time series with the inclusion of indices of seasonal fluctuations and how to calculate seasonal indexes by the method of constant mean.

In order to determine which method is appropriate to apply in this case, we constructed a graph reflecting the dynamics of investments in fixed capital for 2011–2017, presented on picture 1:



Picture 1 – Dynamics of investments into fixed capital in the Republic of Belarus in 2011-2017

**Results and their discussion.** According to the schedule shown in picture 1, it is seen that in the dynamics of the studied phenomena are expressed seasonal fluctuations, however, to describe the development of this phenomenon with one trend equation for the entire study period is not possible, so we need to implement a periodization data and use different methods of measuring seasonal variations at each time interval separately. Also, the graph shows that in the development of investment in fixed capital in the Republic of Belarus it is possible to allocate two periods: from 2011 to

2014 and from 2015 to 2017. Further, each of the periods was studied separately.

For the period from 2011 to 2014, the method of analytic alignment was constructed the equation of the trend:  $y = 313,97x + 1363,3$ . The magnitude of the accuracy of the approximation has the value  $R^2 = 0,7304$ , which shows that the resulting trend equation reasonably describes the trend of development of investments into fixed capital over the period of time.

In addition to trends in the development of this series contains a significant seasonal component that should be measured and taken into account when forecasting. As in this case, there is a definite trend, the seasonal index is the ratio of the actual levels to levels obtained using the equations of the trend. The seasonal index for each quarter are averaged when using the formula of average arithmetic weighed [2].

$$\bar{I}_{Si} = \frac{\sum_i I_{Si} \bar{y}_i}{\sum_i \bar{y}_i}$$

Where  $\bar{I}_{Si}$  – the average seasonal index for the quarter for all time;  $\bar{y}_i$  – the average quarterly level for each year;  $I_{Si}$  – the seasonal index for the quarter. Using this method, we get the results shown in table 1.

Table 1 – Dynamics of investments into fixed capital in the Republic of Belarus for the years 2011–2014

Year	Quarter	Investments, million r.	Trend	The annual average trend	The seasonal index	Average seasonal index	Trend seasonally adjusted
2011	I	1206,61	1950,27	2421,225	0,619	0,720	1404,350
	II	2048,48	2264,24		0,905	0,777	1760,405
	III	2204,29	2578,21		0,855	0,794	2046,686
	IV	4407,11	2892,18		1,524	1,026	2968,128
2012	I	2349,74	3206,15	3677,105	0,733	0,720	2308,684
	II	3782,07	3520,12		1,074	0,777	2736,829
	III	4273,00	3834,09		1,114	0,794	3043,654
	IV	5085,13	4148,06		1,226	1,026	4256,988
2013	I	3585,17	4462,03	4932,985	0,803	0,720	3213,018
	II	4942,30	4776,00		1,035	0,777	3713,253
	III	5729,68	5089,97		1,126	0,794	4040,622
	IV	6700,29	5403,94		1,240	1,026	5545,847
2014	I	4146,98	5717,91	6188,865	0,725	0,720	4117,352
	II	5268,63	6031,88		0,873	0,777	4689,677
	III	5546,75	6345,85		0,874	0,794	5037,590
	IV	7603,53	6659,82		1,142	1,026	6834,706

A set of average seasonal indexes by quarter forms the seasonal wave.

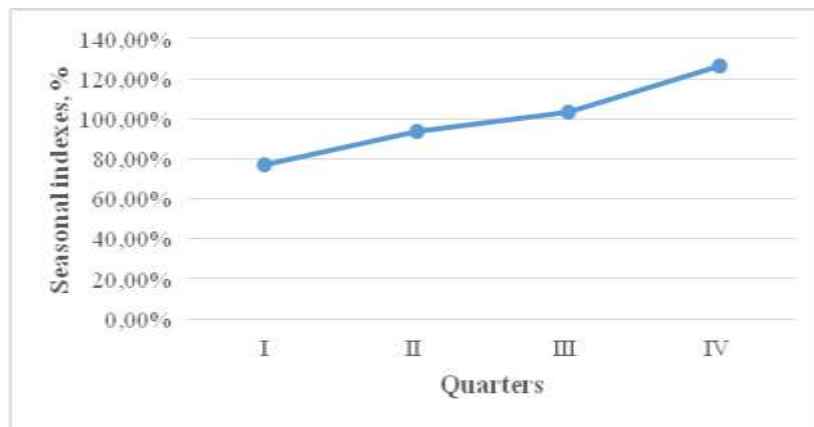
To characterize seasonal fluctuations of investments in fixed capital in the period from 2015 to 2017 was used the method of constant mean because in this period there is practically no trend in capital investment [3].

Calculation of average seasonal indexes is as follows

$$I_s = \frac{\bar{y}_i}{\bar{y}} * 100\%$$

Where  $\bar{y}_i$  – the average for each quarter for 3 years;  $\bar{y}$  - total average quarterly level in 3 years.

Calculated with this formula the average seasonal indexes form the wave, which is shown in picture 2.



Picture 2 – Schedule of seasonal wave for 2011–2014

**Conclusion.** In this article we have identified and measured seasonal fluctuations of investments in fixed capital with the presence of a trend and with its absence. When using both the first and the second methods, we got similar results. Therefore, we can say that we have identified and measured steady seasonal fluctuations of investments in fixed capital in the Republic of Belarus: in the second and the third quarters investments gradually increase, in the fourth quarter there is a sharp increase, and then in the first quarter of next year - a sharp decline. Detected seasonal variations should be taken into account in the planning and forecasting of investments in fixed capital.

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## MULTISTATIC PASSIVE SURVEILLANCE SYSTEMS

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The importance of passive radars in today's electronic war continues to grow especially for hidden activities, prevention of own radiation, use of appropriate parts of the frequency spectrum properties and also because of providing very comprehensive and extensive information about the objects of interest under conditions of difficult revelation of the own activities [1–3].

The aim of the research is search of ways raise efficiency of a detection problems solution problems and measurement radio emission radiants spatial co-ordinates in multiple objective circumstances.

**Material and methods.** The basic method of research is the mathematical simulation modelling of work time different of arrival, goniometric and composite multipositional passive coherent locators at presence a considerable quantity of observation plants in a working zone. Modelling was spent in media of programming Mathcad 15 and Embarcadero® C ++ Builder® 2010.

**Results and their discussion.** Passive radar systems encompass two classes of radar systems [4–6]. First class of them detects and tracks objects by processing reflections from non-cooperative sources of illumination in the environment, such as commercial broadcasts and communications signals [7]. It is a specific case of bistatic radar, the latter also including the exploitation of cooperative and non-cooperative radar transmitters.

In a passive radar system, there is no dedicated transmitter. Instead, the receiver uses third-party transmitters in the environment, and measures the time difference of arrival between the signal arriving directly from the transmitter and the signal arriving via reflection from the object. This allows the bistatic range of the object to be determined. In addition to bistatic range, a passive radar will typically also measure the bistatic Doppler shift of the echo and its direction of arrival. These allow the location, heading and speed of the object to be calculated.

Second class includes electronic support measures systems. These systems use own target radiation (such as radar, communications, or transponder emissions) for spatial detect and track aircrafts. In addition, these systems do not exploit reflected energy and hence are more accurately described as ESM systems. Well known examples include the Czech TAMARA and VERA systems and the Ukrainian Kolchuga system.

A passive radar typically employs the following processing steps:

- Reception of the direct signal from the transmitter(s) and from the surveillance region on dedicated low-noise, linear, digital receivers;



- Digital beamforming to determine the direction of arrival of signals and spatial rejection of strong in-band interference;
- Adaptive filtering to cancel any unwanted direct signal returns in the surveillance channel(s);
- Transmitter-specific signal conditioning;
- Cross-correlation of the reference channel with the surveillance channels to determine object bistatic range and Doppler;
- Detection using constant false alarm rate (CFAR) scheme;
- Association and tracking of object returns in range/Doppler space, known as “line tracking”;
- Association and fusion of line tracks from each transmitter to form the final estimate of an objects location, heading and speed.

Passive radar performance is comparable to conventional short and medium range radar systems. Detection range can be determined using the standard radar equation, but ensuring proper account of the processing gain and external noise limitations is taken. Furthermore, unlike conventional radar, detection range is also a function of the deployment geometry, as the distance of the receiver from the transmitter determines the level of external noise against which the targets must be detected. However, as a rule of thumb it is reasonable to expect a passive radar using FM radio stations to achieve detection ranges of up to 150 km, for high-power analogue TV and US HDTV stations to achieve detection ranges of over 300 km and for lower power digital signals (such as cell phone and DAB or DVB-T) to achieve detection ranges of a few tens of kilometers.

Passive radar accuracy is a strong function of the deployment geometry and the number of receivers and transmitters being used. Systems using only one transmitter and one receiver will tend to be much less accurate than conventional surveillance radars, whilst multistatic systems are capable of achieving somewhat greater accuracies.

When multiple transmitters are used, a target can be potentially detected by every transmitter. The return from this target will appear at a different bistatic range and Doppler shift with each transmitter and so it is necessary to determine which target returns from one transmitter correspond with those on the other transmitters. Having associated these returns, the point at which the bistatic range ellipses from each transmitter intersect is the location of the target. The target can be located much more accurately in this way, than by relying on the intersection of the (inaccurate) bearing measurement with a single range ellipse. Again the optimum approach is to combine the measurements from each transmitter using a non-linear filter, such as the extended or unscented Kalman filter.

**Conclusion.** Faced with the prospect of aerial stealth proliferation, contemporary military science is looking for antistealth defense options. Passive radar is a receive-only system that uses transmitters of opportunity

and own target radiation for those tracking. Integrating a system of netted receivers, passive radar can detect, track, and target piloted and unpiloted stealth systems and provide cueing for anti-air weapons systems. A passive radar system emits no radio energy and can be well camouflaged in both urban and rural landscapes. The threat system produces no indications on friendly radar warning receivers and is difficult to locate and target. Faced with a passive radar threat, the airpower may find itself unable to achieve air superiority at an acceptable cost. Ongoing advances in passive radar will deny traditional means to defeat enemy air defenses, make air superiority difficult to achieve against a passive radar opponent, and require changes in thinking to maintain air offensive power projection capability. Ongoing surge in passive radar relates to advances in signal processing and sensor fusion. The overwhelming offensive power of the airplane will largely be mitigated by the deployment of radar and modern air defenses. Airpower will not prove an all-powerful offensive weapon that could not be countered, and the bomber will not always get through.

Stealth is the centerpiece of the modern USA's and NATO's military aircraft industry and air superiority strategy. But stealth technology does not make an aircraft invisible. The tactical advantage accrued by being able to detect, close, and attack from a covert stance completely dominates all other factors in any encounter algorithm. In Serbia in 1999, a SAM battery commander attacked from a covert stance and won the tactical advantage over F-117 "stealth fighter" (more known as "Nighthawk"). It was a missile shot heard around the stealth world.

Development of Multistatic Passive Surveillance Systems is the end of the Stealth superiority era.

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## WI-FI NETWORKS: PENETRATION AND PROTECTION

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Access to the Internet can be obtained almost anywhere. In the park, in a cafe, at school, at the university and at public transport stops. This is made possible by wireless access networks. We are used to refer to such wifi networks, but this is only a trademark, so do not talk about it. In connection with the spread of this technology, it is likely that your traffic will be able to track. To secure users, wireless security protocols were developed: WEP, WPA/WPA2, WPS, OPEN.

The purpose of this work is find vulnerabilities in wireless network security protocols, to study them and make recommendations for security.

**Material and methods.** To compare the security protocols, we used data on the vulnerabilities of these protocols. The messages of different users on the forums in the Internet were analyzed. Documentation for wireless network security protocols was studied.

**Results and their discussion.** OPEN is the absence of any protection. The access point and the client do not mask the data transmission in any way. Almost any wireless adapter in any laptop with Linux can be installed in the listening mode, when instead of discarding packets intended not for him, it will capture them and transfer them to the OS where they can be easily viewed.

It is on this principle that wired networks operate - they do not have built-in protection and “crashing” into it or simply connecting to a hub / switch, the network adapter will receive packets of all devices in this network segment in an open form. However, with a wireless network, you can “crash” from anywhere – 10–20–50 meters and more, and the distance depends not only on the power of your transmitter, but also on the length of the hacker's antenna. Therefore, open data transmission over a wireless network is much more dangerous.

WEP is the first standard for Wi-Fi protection. It stands for Wired Equivalent Privacy, but in fact it gives much less protection than these wired networks, because it has a lot of flaws and is hacked in many different ways, which, due to the distance covered by the transmitter, makes the data are more vulnerable. It should be avoided almost as much as open networks - it provides security only for a short time, after which any transmission can be completely opened regardless of the complexity of the password. The situation is aggravated by the fact that passwords in WEP are either 40 or 104 bits, which is an extremely short combination and it can be picked up in seconds (this is without taking into account the errors in the encryption itself).

WEP was invented in the late 90's, which justifies it, but those who still use it – no.

The main problem of WEP is in the fundamental design error. Stream encryption is done using a temporary key. WEP actually transmits several bytes of this key together with each data packet. Thus, regardless of the complexity of the key, you can open any transfer simply by having a sufficient number of intercepted packets (several tens of thousands, which is quite small for an actively used network).

WPA is the second generation that replaced WEP. It stands for Wi-Fi Protected Access. A qualitatively different level of protection due to the consideration of WEP errors. The password length is arbitrary, from 8 to 63 bytes, which greatly complicates its selection (compare with 3, 6 and 15 bytes in WEP).

The standard supports various encryption algorithms for the transmitted data after the handshake: TKIP and CCMP. The first is a kind of bridge between WEP and WPA, which was invented at that time, while IEEE was busy creating a full-fledged CCMP algorithm. TKIP, like WEP, suffers from some types of attacks, and is generally not secure. Now it is rarely used and in general, the use of WPA with TKIP is almost the same as using a simple WEP.

One of the fun features of TKIP is the possibility of a so-called Michael attack. To quickly patch up some particularly critical holes in WEP in TKIP, it was introduced the rule that the access point should block all communications through itself (that is, "fall asleep") for 60 seconds if an attack is found on the key selection. Michael-attack - a simple transfer of "corrupted" packages to completely disconnect the entire network.

In addition to different encryption algorithms, WPA / WPA2 supports two different initial authentication modes (password checks for client access to the network) - PSK and Enterprise. PSK (sometimes referred to as WPA Personal) is an input by a single password that the client enters when connected. It's simple and convenient, but in the case of large companies it can be a problem - say, your employee left and that he could no longer access the network have to change the password for the entire network and notify other employees about it. Enterprise removes this problem due to the presence of multiple keys stored on a separate server - RADIUS. In addition, Enterprise standardizes the authentication process itself in the EAP (Extensible Authentication Protocol) protocol, which allows you to write your own algorithm.

WPS is an interesting technology that allows us not to think about the password at all, but simply to press the button and immediately connect to the network. In fact, this is a "legal" method of bypassing password protection in general, but surprisingly, it was widely distributed with a very serious miscalculation in the access system itself - it's years after the sad experience with WEP.

WPS allows the client to connect to the access point using the 8-character code consisting of digits (PIN). However, due to an error in the standard, only 4 of them need to be guessed. Thus, just 10,000 retry attempts, and regardless of the complexity of the password for accessing the wireless network, you automatically get this access, and with it, in addition - and this same password as it is.

Given that this interaction occurs before any security checks, you can send 10–50 requests to the WPS throughput per second, and after 3–15 hours (sometimes more, sometimes less) you will receive the keys. When this vulnerability was revealed, manufacturers began to introduce a limit on the number of login attempts (the rate limit), after exceeding which the access point automatically for some time disables the WPS - but so far such devices are not more than half of those already released without this protection. Even more - a temporary shutdown cardinally does not change anything, since at one login attempt per minute we will need only  $10000/60/24 = 6.94$  days. And the PIN is usually found before the whole cycle goes through. I want to draw your attention once again that with WPS enabled, your password will be inevitably disclosed, regardless of its complexity. Therefore, if you generally need WPS - turn it on only when connecting to the network, and at other times keep this backdoor turned off.

**Conclusion.** The research revealed vulnerabilities in all security protocols. This shows that using wifi networks is not safe. Wifi is not suitable for transferring secret information. In order to maximize your safety, follow these simple recommendations: do not connect to open networks, before connecting, check the protocol type, use the latest version of the software.

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## ON THE PROPERTIES OF FITTING CLASSES, GENERATED $\pi$ -CORADICALS

**K. Lantsetova**

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Only finite groups are considered. In the definitions and notation we follow [1].

A class  $\mathfrak{F}$  is a *Fitting class* if and only if the following two conditions are satisfied:



1. If  $G \in \mathfrak{F}$  and  $N \trianglelefteq G$ , then  $N \in \mathfrak{F}$ ;
2. If  $N_1$  and  $N_2 \trianglelefteq G$ ,  $N_1$  and  $N_2 \in \mathfrak{F}$ , then  $N_1 N_2 \in \mathfrak{F}$ .

Let  $\mathbb{P}$  be the set of all prime numbers,  $\pi \subseteq \mathbb{P}$  and  $\pi' = \mathbb{P} \setminus \pi$ .

A formation is a (possibly empty) class  $\mathfrak{F}$  of groups with the following two properties:

1. If  $G \in \mathfrak{F}$  and  $N \trianglelefteq G$ , then  $G/N \in \mathfrak{F}$ ;
2. If  $N_1, N_2 \trianglelefteq G$  with  $N_1 \cap N_2 = 1$  and  $G/N_1 \in \mathfrak{F}$  and  $G/N_2 \in \mathfrak{F}$ , then  $G \in \mathfrak{F}$ .

It follows from the definition of a formation that if  $\mathfrak{F}$  is a non-empty formation, then for any group  $G$  there exists the smallest normal subgroup whose factor group belongs to  $\mathfrak{F}$ . This subgroup is  $\mathfrak{F}$ -coradical of  $G$ , written  $G^{\mathfrak{F}}$ . For example,  $\mathfrak{E}^\pi$ -coradical of  $G$  is a subgroup  $O^\pi(G)$ , where  $\pi$  is a set of primes.

For each set of primes  $\pi$  define set  $O^\pi(\mathfrak{F}) = \{O^\pi(G) : G \in \mathfrak{F}\}$ . Denote by  $f_\pi$  the map, which sends Fitting class  $\mathfrak{F}$  to Fitting class, generated by set  $O^\pi(\mathfrak{F})$ , written *Fit*  $O^\pi(\mathfrak{F})$  or  $\mathfrak{F}f_\pi$ .

The problem arises of studying the properties of a class  $\mathfrak{F}f_\pi$ . The main goal of this work is to describe the properties of the Fitting classes generated by  $\pi$ -coradicals of groups. The main results of the paper are presented in two theorems.

**Theorem 1.** *Let  $\mathfrak{F}$  and  $\mathfrak{H}$  be Fitting class and  $\pi$  a set of primes. Then*

1.  $\mathfrak{F} \subseteq \mathfrak{H}$  implies, that  $\mathfrak{F}f_\pi \subseteq \mathfrak{H}f_\pi$ .
2.  $\mathfrak{F}f_\pi \subseteq \mathfrak{H}f_\pi$  if and only if  $O^\pi(\mathfrak{F}) \subseteq O^\pi(\mathfrak{H})$ .
3.  $(\mathfrak{F}f_\pi)f_\pi = \mathfrak{F}f_\pi$ .
4.  $\mathfrak{F}f_\pi = \mathfrak{H}f_\pi$  if and only if  $\mathfrak{F} \subseteq \mathfrak{H}\mathfrak{E}_\pi$  u  $\mathfrak{H} \subseteq \mathfrak{F}\mathfrak{E}_\pi$ .

We use the Lockett operators [2] « \* » and «  $\cdot$  » to describe the properties of the class  $\mathfrak{F}f_\pi$ , , which compare each non-empty Fitting class to the smallest Fitting class  $\mathfrak{F}^*$ , which contains  $\mathfrak{F}$ , so, that  $(G \times H)_{\mathfrak{F}^*} = G_{\mathfrak{F}^*} \times H_{\mathfrak{F}^*}$  for all groups  $G$  and  $H$ , and Fitting class  $\mathfrak{F}_*$  the smallest of the Fitting classes  $\mathfrak{X}$  so, that  $\mathfrak{X}^* = \mathfrak{F}^*$ . Next theorem is proved

**Theorem 2.**  $(\mathfrak{F}f_\pi)^* = \mathfrak{F}^*$  if and only if  $\mathfrak{F}f_\pi = \mathfrak{F} \cap \mathfrak{X}$ .

We give the plan of the proof of the theorem. Note that the Lausch groups are used for the proof. We use the following lemma:

**Lemma 3 [3].** *Let  $\mathfrak{F}$  and  $\mathfrak{X}$  be Fitting classes with  $\mathfrak{F}_* \subseteq \mathfrak{X} \subseteq \mathfrak{F}^*$ . There exists a (possibly infinite) abelian group  $A$ , and a map  $d$  which assigns to each group  $G$  in  $\mathfrak{F}$  a homomorphism  $d_G$  from  $G$  to  $A$  such that:*

- 1) if  $f$  is a normal embedding of a group  $N$  in some group  $G$ , and  $G$  lies in  $\mathfrak{F}$ , then for each element  $n$  of  $N$   $nd_N = (nf)d_G$ ;

- 2) if  $G$  is a group in  $\mathfrak{F}$ , then  $G_{\mathfrak{X}} = \ker d_G$ ;  
 3)  $A = \{gd_G : g \in G \wedge G \in \mathfrak{X}\}$ ;  
 4) If  $\mathfrak{Y}$  is a Fitting class with  $\mathfrak{X} \subseteq \mathfrak{Y} \subseteq \mathfrak{F}$ , and  
 $A(\mathfrak{Y}) = \{gd_G : g \in G \wedge G \in \mathfrak{Y}\}$

then  $A(\mathfrak{Y})$  is a subgroup of  $A$ . The map  $A \rightarrow A(\mathfrak{Y})$  defines a lattice isomorphism between the set of such Fitting classes  $\mathfrak{Y}$  and the subgroup lattice of  $A$ .

Retaining the notation of the above lemma, we say that  $\mathfrak{X}$  admits the Fitting pair  $(A, d_{|\mathfrak{X}})$ , and remark that  $(A, d_{|\mathfrak{X}})$  is a unique up to isomorphism [3]. Suppose that  $\mathfrak{Y}$  is a Fitting class such that  $\mathfrak{F}_* \subseteq \mathfrak{Y} \subseteq \mathfrak{F}^*$ , that  $\mathfrak{F}_*$  admits the Fitting pair  $(A, d_{|\mathfrak{F}_*})$  and that  $n$  denotes the natural homomorphism from  $A$  onto  $A/A(\mathfrak{Y})$ . It is clear that  $\mathfrak{Y}$  admits the Fitting pair  $(A/A(\mathfrak{Y}), p_{|\mathfrak{Y}})$ , where  $p$  assigns to each  $G$  in  $\mathfrak{F}$  the homomorphism  $d_G n$  from  $G$  into  $A/A(\mathfrak{Y})$ .

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## USING OF LEAST SQUARE METHOD IN FORECASTING

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In the natural sciences, engineering and economics, frequently we deal with formulas based on the processing of statistical data or the results of experiments. One of the common methods for constructing such formulas is the least square method.

The purpose of the study is to establish a link between two estimates  $x$  and  $y$  from the statistical data representing the results of some studies, and to write them in a table.

**Material and methods.** The article considers the least squares method, which is based on the theory of local extremum for functions of several variables [1]. LSM is a very common method of processing observations, experimental and personal data. Here is a method of applying for solving learning problems, for self-study [2].

**Results and their discussion.** Let's pretend that there is linear dependence between  $x$  and  $y$ ,  $y = ax + b$ , where  $a$  and  $b$  are coefficients to be found,  $y$  is theoretical value of ordinate. To find  $a$ ,  $b$  we should apply the

least squares method [1]. Points, which are built on the basis of experimental data, do not lie on a straight line. For the first point,  $ax_1 + b + y_1 = \varepsilon_1$ , for the second -  $ax_2 + b + y_2 = \varepsilon_2$ , for the latter -  $ax_n + b + y_n = \varepsilon_n$ .

Such values as  $\varepsilon_1, \varepsilon_2, \dots, \varepsilon_n$  are errors. In the geometric sense, this is the difference between the ordinate of a point on the line and the ordinate of the experimental point with the same abscissa. Errors depend on the selected position of the straight line, i.e. from  $a$  and  $b$ . It is required to choose  $a$  and  $b$  so that these errors are as small as possible in absolute value.

If the points on the graph are arranged like some parabola, then we can assume a quadratic dependence between  $x$  and  $y$ :  $y = ax^2 + bx + c$ .

The essence the least squares method is that unknown coefficients for recording the selected function are selected from the condition that the sum of error squares is minimal. If the sum of squares is minimal, then the errors will be small on average in absolute value.

Finding the equation of a straight line from empirical data is called straight line alignment, and finding the parabola equation is called parabola alignment. Other functions can also meet in economic calculations.

So, initially, the least squares method is considered for finding the parameters of the linear function  $y = ax + b$ .

**Example** [2]. The experimental data are given in the table:

Year, t	1	2	3	4	5	6	7
Profit	51	53	59	62	64	66	67

We should get and compare linear and quadratic dependences of profit during years of activity of the enterprise.

**Solution.** For the function  $y = ax + b$ , the system of equations for finding  $a$  and  $b$  has the form [1]:

$$a \sum x_i^2 + b \sum x_i = \sum x_i y_i,$$

$$a \sum x_i + bn = \sum y_i.$$

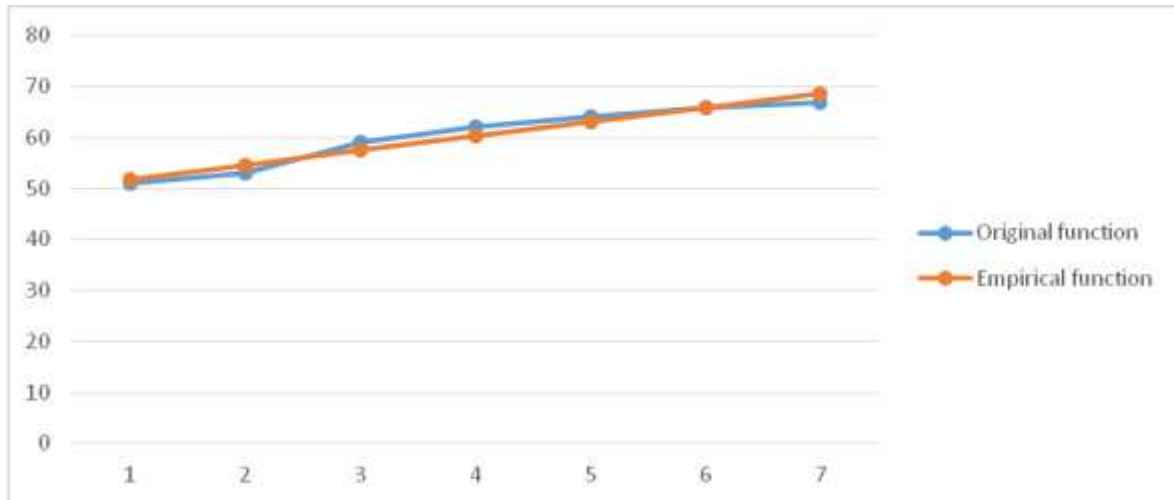
We made the table in Microsoft Excel:

$i$	$x_i$	$y_i$	$x_i^2$	$x_i y_i$	Emp. F.
1	1	51	1	51	51,82
2	2	53	4	106	54,64
3	3	59	9	177	57,46
4	4	62	16	248	60,28
5	5	64	25	320	63,1
6	6	66	36	396	65,92
7	7	67	49	469	68,74
Sum	28	422	140	1767	421,96



Then, we found  $a=2,82$  and  $b=49$ . The required dependence has the form:

$y = 2,82x + 49$ . Linear dependence is shown on the next diagram (Picture 1):



**Picture 1 – Linear dependence**

The correlation coefficient is 0,973013, which indicates a very strong interdependence of the variables. In turn, the coefficient of determination is 0,946754, which indicates the existence of a close functional conjunction. On the next step, we will make the presence of a quadratic dependence research  $y = ax^2 + bx + c$  with the same data. There is the system of equations for finding coefficients of the function

$$a \sum x_i^4 + b \sum x_i^3 + c \sum x_i^2 = \sum x_i^2 y_i,$$

$$y = ax^2 + bx + c [1]: a \sum x_i^3 + b \sum x_i^2 + c \sum x_i = \sum x_i y_i$$

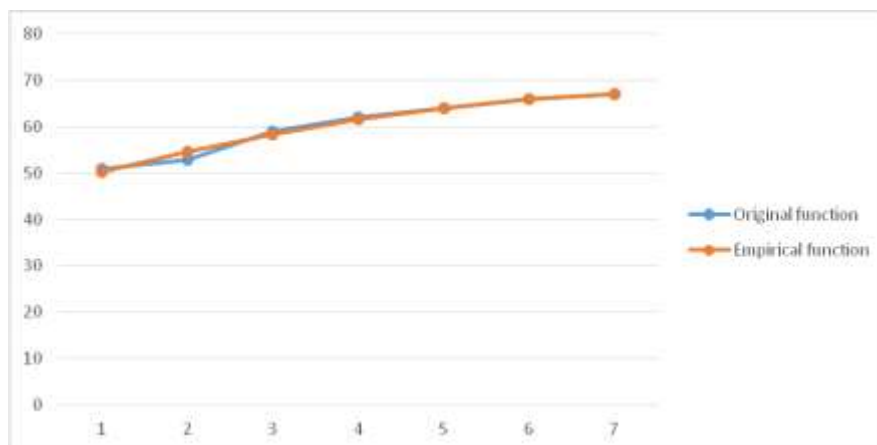
$$a \sum x_i^2 + b \sum x_i + cn = \sum y_i.$$

We made the table in Microsoft Excel:

$i$	$x_i$	$y_i$	$x_i^2$	$x_i^3$	$x_i^4$	$x_i y_i$	$x_i^2 y_i$	Emp. F.
1	1	51	1	1	1	51	51	50,209
2	2	53	4	8	16	106	212	54,636
3	3	59	9	27	81	177	531	58,421
4	4	62	16	64	256	248	992	61,564
5	5	64	25	125	625	320	1600	64,065
6	6	66	36	216	1296	396	2376	65,924
7	7	67	49	343	2401	469	3283	67,141
Sum	28	422	140	784	4676	1767	9045	421,96

$a = -0,321$  and  $b = 5,39$ ,  $c = 45,14$ . The required dependence has the form:

$y = 0,321x^2 + 5,39x + 45,14$ . Graph of quadratic dependence (Picture 2):



Picture 2 – Quadratic dependence

**Conclusion.** This article illustrates the application of LSM using Microsoft Excel programs. Finally, the revealed better dependence, allows making a forecast for the future, based on the data of statistical observations.

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## ON THE COVER-AVOID PROPERTY OF INJECTORS OF FINITE GROUP

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Throughout this paper, all groups are finite. The notations and terminologies are standard as in [1, 2]. Let  $\mathbb{P}$  be the set of all primes,  $\pi \subseteq \mathbb{P}$ , and  $\pi' = \mathbb{P} \setminus \pi$ . We denote by  $S^\pi$  and  $E_{\pi'}$  the classes of all  $\pi$ -soluble groups and all  $\pi'$ -groups respectively.

Recall that a class of groups  $F$  is called a *Fitting class* if  $F$  is closed under taking normal subgroups and products of normal  $F$ -subgroups. For any a nonempty class  $F$  of groups, a subgroup  $V$  of  $G$  is said to be  $F$ -maximal if  $V \in F$  and  $U = V$  whenever  $V \leq U \leq G$  and  $U \in F$ . A subgroup  $V$  of a group  $G$  is said to be an  $F$ -injector of  $G$  if  $V \cap N$  is an  $F$ -maximal subgroup of  $N$  for every subnormal subgroup  $N$  of  $G$ . Recall that a nonempty set  $F$  of subgroups of a group  $G$  is called a *Fitting set of  $G$*  [3], if the following three conditions hold:

- (1) If  $T \trianglelefteq S \in F$ , then  $T \in F$ ;
- (2) If  $S \in F$  and  $T \in F$ ,  $S \trianglelefteq ST$  and  $T \trianglelefteq ST$ , then  $ST \in F$ ;

(3) If  $S \in F$  and  $x \in G$ , then  $S^x \in F$ .

For a Fitting set  $F$  of  $G$ , the  $F$ -injector of  $G$  is similarly defined as the  $F$ -injector for Fitting class  $F$  (see [1, Definition VIII. (2.5)]).

Hartley [4] proved that for any soluble Fitting class  $F$  (that is, all groups in  $F$  are soluble), every  $F$ -injector  $V$  of a soluble group  $G$  either covers or avoids every chief factor  $H/K$  of  $G$ , that is, either  $(V \cap H)K = H$  or  $(V \cap H)K = K$ .

In this connection, the problem arises in the class of non-soluble groups, describe the cover-avoid property of  $F$ -injectors of a group  $G$  on its chief factors.

For any set  $F$  of subgroups of  $G$ , we let  $\sigma(F) = \cup_{G \in F} \sigma(G)$ .

It is proved

**Theorem.** Let  $F$  be a Fitting set of a group  $G$  and  $\emptyset \neq \pi \subseteq \mathbb{P}$ . Then every  $F$ -injector of  $G$  either covers or avoids every chief factor of  $G$  in each of the following cases:

- 1)  $G \subseteq F \circ S^\pi$ , where  $\pi = \sigma(F)$ ;
- 2)  $G \subseteq S^\pi$  and  $F \circ E_\pi = F$ .

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## ON THE POSITIVE INTEGER SOLUTION OF NONLINEAR EQUATIONS $X^2+AX=B$ AND $X^3+AX^2+BX=C$ FOR THE SECOND ORDER MATRICES

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The problem of finding integer positive solution of nonlinear matrix equations of polynomial type for matrices of various orders plays an important role in solving a wide range of problems associated with the modeling of economic, social processes [1, c. 189].

The aim of this work is to find the simplest method for solving matrix equations for the second order matrices.

**Material and methods.** The matrix equation was recorded in the form of a system consisting of four equations, which were solved by analytical

methods. In the process of the study, a package of symbolic mathematics Maple 18 was used.

**Results and their discussion.** Consider the nonlinear matrix equation

$$X^2 + AX = B \tag{1}$$

where  $X = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ ,  $A = \begin{pmatrix} \alpha & \beta \\ \gamma & \delta \end{pmatrix}$ ,  $B = \begin{pmatrix} K & L \\ M & N \end{pmatrix}$ .

**Lemma 1.** *To find a matrix-root of equation (1), it is necessary for each possible value of the variable  $a$  to solve the quadratic equation  $fb^2 + (a + \alpha + g + \beta f)b - L + \beta g = 0$ , for the variable  $b$ , where*

$$f = \frac{m}{k}, \quad g = \frac{m\beta - ka - k\delta}{k}, \quad k = K - a^2 - \alpha a, \quad m = M - \gamma a;$$

*the variables  $c$  and  $d$  can be found using the connection formula for these variables with variable  $d$ :  $c = \frac{k}{\beta + b}$ ,  $d = fb + g$ . The estimate for the variable  $a$  has the form:*

$$1 \leq a \leq \sqrt{K - 1 - \alpha - \beta}.$$

**Proof.** In this case, the system of equations corresponding to equation (1) will have the following form:

$$\begin{cases} a^2 + bc + \alpha a + \beta c = K, \\ b(a + d) + \alpha b + \beta d = L, \\ c(a + d) + \gamma a + \delta c = M, \\ bc + d^2 + \gamma b + \delta d = N. \end{cases} \tag{2}$$

We consider the first and third equations of system (2). Introducing the new variables  $k$  and  $m$ :  $k = K - a^2 - \alpha a$ ,  $m = M - \gamma a$ , we obtain a system of equations (3):

$$\begin{cases} bc + \beta c = k, \\ c(a + d) + \delta c = m. \end{cases} \tag{3}$$

Solving the system (3), we can find a formula expressing the relationship between the variables  $b$  and  $d$ :  $d = fb + g$ , where

$$f = \frac{m}{k}, \quad g = \frac{m\beta - ka - k\delta}{k}.$$

Substituting it into the second equation of system (2), we obtain an equation of the second order with respect to the variable  $b$ :

$$fb^2 + (a + \alpha + g + \beta f)b - L + \beta g = 0 \tag{4}$$

Solving equation (4) with respect to the variable  $b$ , we can find the variable  $d$ , and the variable  $c$  can be found using the first equation of system (3).

To find an asymmetric matrix-root of equation (1) under the condition that the matrices  $A$  and  $B$  are not symmetric matrices, it is necessary for each

possible value of the variable  $a$  to solve the quadratic equation for the variable  $b$  and using the coupling formulas to find the values of the variables  $c$  and  $d$ .

Consider the nonlinear matrix equation

$$X^3 + AX^2 + BX = C \quad (5)$$

$$\text{where } X = \begin{pmatrix} a & b \\ c & d \end{pmatrix}, A = \begin{pmatrix} \alpha & \beta \\ \gamma & \delta \end{pmatrix}, B = \begin{pmatrix} \varepsilon & \varphi \\ \psi & \mu \end{pmatrix}, C = \begin{pmatrix} K & L \\ M & N \end{pmatrix}.$$

**Lemma 2.** *To find a matrix-root of equation (5), it is necessary for the variable  $b$  to solve the quadratic equation  $psb^2 + (kr - np + sq)b - nq = 0$ , where  $p = 2a + d + \alpha$ ,  $r = a + 2d + \delta$ ,  $q = \beta(a + d) + \varphi$ ,  $s = \gamma(a + d) + \psi$ ,  $k = K - a^3 - \alpha a^2 - \varepsilon a$ ,  $n = N - d^3 - \delta d^2 - \mu d$ . The variable  $c$  can be found using the relation formula with the variable  $b$ :  $c = \frac{k}{bp + q}$ . The estimate for*

*the variable  $a$  has the form:  $1 \leq a \leq \sqrt[3]{K - 3 - 2\alpha - \varepsilon - 2\beta - \varphi}$ . The estimate for the variable  $d$  has the form:  $1 \leq d \leq \sqrt[3]{N - 3 - 2\gamma - \psi - 2\delta - \mu}$ .*

**Proof.** In this case, the system of equations corresponding to equation (5) will have the following form:

$$\begin{cases} a^3 + 2abc + bcd + \alpha a^2 + \alpha bc + \beta ac + \beta cd + \varepsilon a + \varphi c = K, \\ a^2b + b^2c + abd + bd^2 + \alpha ab + \alpha bd + \beta bc + \beta d^2 + \varepsilon b + \varphi d = L, \\ a^2c + bc^2 + acd + cd^2 + \gamma a^2 + \gamma bc + \delta ac + \delta cd + \psi a + \mu c = M, \\ abc + 2bcd + d^3 + \gamma ab + \gamma bd + \delta bc + \delta d^2 + \psi b + \mu d = N. \end{cases} \quad (6)$$

Consider the first and fourth equations of system (6):

$$\begin{cases} bcp + cq = k, \\ bcr + bs = n. \end{cases} \quad (7)$$

where  $k = K - a^3 - \alpha a^2 - \varepsilon a$ ,  $n = N - d^3 - \delta d^2 - \mu d$ ,  $p = 2a + d + \alpha$ ,  $q = \beta(a + d) + \varphi$ ,  $r = a + 2d + \delta$ ,  $s = \gamma(a + d) + \psi$ .

Expressing the variable  $c$  from the first equation of system (7), we obtain:

$$c = \frac{k}{bp + q} \quad (8)$$

Substituting expression (8) into the second equation of system (7), we obtain an equation of the second order with respect to the variable  $b$ :

$$psb^2 + (kr - np + sq)b - nq = 0 \quad (9)$$

To solve the problem it is necessary to solve the quadratic equation (9) for each possible pair of values of the variables  $a$  and  $d$  to find the variable  $b$ , using the formula (8), to find the value of the variable  $c$ .

To solve the matrix equation (5), we can use the following program written in Pascal.

```

Var W, X, Y, Z, a, d, m1, t1, alpha, beta, gamma, delta, epsilon, fi, psi,
mu, k, n: integer; b1, b2, c1, c2, m, t, p, q, r, s, dis, u1, u2, v1, v2: real;
begin
read( W, X, Y, Z, alpha, beta, gamma, delta, epsilon, fi, psi, mu);
m:=power(W-3-2*alpha-epsilon-2*beta-fi, 1/3); m1:=trunc(m);
t:=power(Z-3-2*gamma-psi-mu-2*delta, 1/3); t1:=trunc(t);
for a:=1 to m1 do begin k:=W-a*a*a-alpha*a*a-epsilon*a;
for d:=1 to t1 do begin n:=Z-d*d*d-delta*d*d-mu*d;
p:=2*a+d+alpha; q:=beta*(a+d)+fi; r:=a+2*d+delta;
s:=gamma*(a+d)+psi;
dis:=(k*r-n*p+s*q)*(k*r-n*p+s*q)+4*p*s*n*q;
if dis>0 then begin
b1:=(-k*r+n*p-s*q+sqrt(dis))/(2*p*s); c1:=k/(b1*p+q);
b2:=(-k*r+n*p-s*q-sqrt(dis))/(2*p*s); c2:=k/(b2*p+q);
u1:=frac(b1); u2:=frac(c1); v1:=frac(b2); v2:=frac(c2); end;
if (b1>0) and (c1>0) and (u1=0) and (u2=0) then begin
writeln(a); writeln(b1); writeln(c1); writeln(d); writeln('Next') end;
if (b2>0) and (c2>0) and (v1=0) and (v2=0) then begin
writeln(a); writeln(b2); writeln(c2); writeln(d); writeln('Next'); end;
end; d:=d+1; end; a:=a+1; end.

```

**Conclusion.** It was shown that we can use analytical methods for solving the problem of finding positive integer solution of matrix equations of polynomial type for second-order matrices.

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## ECOLOGICAL, BIOLOGICAL AND GEOGRAPHICAL STUDY OF THE RATIONAL USE OF THE RESOURCE POTENTIAL AND ENVIRONMENTAL PROTECTION

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### ANTIOXIDATIC ACTIVITY OF WATER EXTRACTS OF EARLY-FLOWERING PLANTS

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Application of curative herbs and pharmaceutical collecting on their basis in traditional and traditional medicine is especially relevant now that is caused by essential advantage of plants in comparison with chemical medicamentous medicines. The main thing from them – lack of the ghost effects and complex impact on an organism [1].

Early-flowering plants well grow and develop under the poor weather conditions that is bound to their antioxidatic system. Therefore it is important to investigate at these plants the maintenance of indexes of enzymatic and non-enzymatic antioxidatic system for further application on biological objects [2].

The work purpose – determine the indices of the non-enzymatic antioxidant system of early plant in the production of water ekstrata.

**Material and methods.** The material for the study was early flowering plants. The dried parts in the shade before the air-dry state of the plants were ground to a particle size of 0.5–1.0 mm. Extracts of plants through models using distilled water. Antioxidant activity and activity of enzymes were determined by standardized biochemical and spectrophotometric methods [3].

Mathematical processing of the received results was carried out by methods of parametrical and nonparametric statistics with use of a package of the statistical Microsoft Excel 2003, STATISTICA 6.0 programs.

**Results and their discussion.** As appears from table 1, the largest content of the sum of phenolic connections, ascorbic acid is noted in extract of leaves of *Prímula véris* (ELPV). The activity of peroxide oxidation of lipids is reduced in ELPV in comparison with water extract of leaves of *Allium ursínium* (ELAU) twice.

In comparison with ELAU in ELPV the maintenance of the following indexes is increased: the sum of phenolic connections – by 2,16 time, ascorbic acid – by 3,32 times. In comparison with extract of leaves of *Allium schoenoprásium* (ELAS) in ELPV the maintenance of the following indexes is increased: the sum of phenolic connections – by 2,07 time, ascorbic acid – by 6,92 times.



The largest content of pigments of the photosynthetic device of plants is observed in ELPV: in comparison with ELAU the maintenance of a chlorophyll by 1,5 times, carotenoids – by 3 times is increased, in comparison with ELAS the maintenance of a chlorophyll is 4,36 times more, carotenoids – by 7,29 times.

Table 1 – The maintenance of indexes of non-enzymatic antioxidatic system in water extracts (1:10) leaves of early-flowering plants ( $M\pm m$ )

Index	Water extract (1:10)		
	ELAU	ELPV	ELAS
Diene conjugates, $\mu\text{mol/g}$	$0,29\pm 0,011^2$	$0,46\pm 0,013^1$	$0,28\pm 0,003^2$
TBA, $\text{nmol/g}$	$7,92\pm 0,35^2$	$3,82\pm 0,18^1$	$1,73\pm 0,32^{1,2}$
Sum of phenolic connections, $\text{mg/g}$	$8,98 \pm 1,52^2$	$19,36 \pm 1,82^1$	$9,36 \pm 0,74^{1,2}$
Sum of flavonoids, $\text{mg/g}$	$0,32\pm 0,02$	$0,28 \pm 0,03^1$	$0,47 \pm 0,04^2$
Acidum ascorbinicum, $\text{mg/g}$	$18,77\pm 0,18^2$	$62,45\pm 0,69^1$	$9,02\pm 0,13^{1,2}$
Chlorophyll, $\text{mg/g}$	$0,32\pm 0,010$	$0,48\pm 0,002^1$	$0,11\pm 0,002^{1,2}$
Carotenoids, $\text{mg/g}$	$0,17\pm 0,012^2$	$0,51\pm 0,010^1$	$0,07\pm 0,001^{1,2}$

The Note –  $^1P < 0,05$  in comparison with ELAU;  $^2P < 0,05$  in comparison with ELPV.

The largest content of pigments of the photosynthetic device of plants is observed in ELPV: in comparison with ELAU the maintenance of a chlorophyll by 1,5 times, carotenoids – by 3 times is increased, in comparison with ELAS the maintenance of a chlorophyll is 4,36 times more, carotenoids – by 7,29 times.

Thus, on the content of endogenic antioxidants and a condition of the assimilatory device, the greatest antioxidatic the activity also has potential to counteract consequences of an oxidizing stress ELPV.

**Conclusion.** Thus, water extracts of early-flowering plants (1:10) have good antioxidatic system and can be used for increase resistance to stress of biological objects to adverse environmental factors.

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**RESULTS OF INTRODUCTION OF SOME PLANTS OF SEEM.  
PETERS IN THE BOTANICAL GARDEN  
OF VITEBSK STATE UNIVERSITY MASHEROVA**

**F. Avliakuliev**

VSU named after P.M. Masherova, Vitebsk, Belarus

An important role in preserving plant wealth belongs to the botanical gardens. Botanical gardens are research institutions that cultivate and study plants that promote botanical knowledge. The basis of botanical gardens are collections of living plants.

The aim of the work is to analyze the results of introduction of the seeds of this family. Legumes in the botanical garden of the VSU named after P.M. Masherov, to assess the introductory stability and the prospects of introducing them into the culture.

**Material and methods.** The material of our research is a collection of plants of this family. Legumes of the Botanical Garden of the Vitebsk State University named after P.M. Masherov.

We studied the features of growth, development of plants of this family. Legumes, using the “Methodology of phenological observations in the botanical gardens of the USSR” [1, p. 13–29]. The capacity for generative and vegetative reproduction was determined according to the scale developed by the Main Botanical Garden (HBS).

**Results and their discussion.** In the collection of the botanical garden, the seeds of this family. Legumes are represented by species and varieties, of which 31 are representatives of the Belarusian flora, 4 species: *Lathyrus laevigatus*, *Trifolium rubens*, *Trifolium spryginii*, *Vicia pisiformis* are protected and listed in the Red Book of the Republic of Belarus. Representatives of the family. Bean collections of the botanical garden have the following life forms according to Serebryakov: perennial grasses – 33, annual – 7, trees – 3, shrubs – 8 species. According to the economic groups, the plants were distributed as follows: medicinal plants – 7, vegetable – 6, fodder – 8, decorative – 10 species.

Long-term observations have shown that the arboreal plants of the family. Legumes in the Botanical Garden of VSU are characterized by different indicators of growth, winter hardiness, drought resistance, shade tolerance, ability to seed and vegetative reproduction (table).

To assess the results of the introduction of herbaceous perennials, a 3-point scale developed by the HBS was used [2, p. 72–77].

By the capacity for generative reproduction, 3 points were obtained for those species in which regular fruiting is observed, samosev; 2 points – fruiting irregular, samosev; 1 point – no fruiting.

By the capacity for vegetative propagation, 3 points were obtained in species with 3 or more new vegetative buds; 2 points – species that give no more than 1–2 new vegetative buds; 1 point – species that do not have vegetative reproduction.

The cold resistance was assessed as follows: 3 points – species that are not damaged by frost and frost; 2 points – partially damaged by severe frosts; 1 point received species that are damaged by frosts almost annually.

Table

Analysis of the behavior of certain tree species sem. Legumes in the Botanical Garden of the VSU

<i>Amorpha fruticosa</i>	In winter, the growths of this year are frozen, but they easily recover, blossom, bind viable seeds, and do not give self-seed.
<i>Caragana arborescens</i>	It is frost-proof, blooms, binds viable seeds, does not give self-seed.
<i>Caragana frutex</i>	It is frost-proof, blooms, binds viable seeds, does not give self-seed.
<i>Caragana fruticosa</i>	Frost-proof, blossoms, fructifies, does not give self-seed.
<i>Cytisus nigricans</i>	Cold weather, but not frozen in the harsh winters, unglazed wood, blossoms, binds seeds, does not give self-seed.
<i>Genista tinctoria</i>	The neodrevesnevshaya part of the shoots freezes, easily regenerates, blossoms, fructifies, self-seeded rather abundant, competes with natural vegetation.
<i>Laburnum anagyroides</i>	Frost-proof, blooms, fruiting, without self-seeding.
<i>Robinia pseudoacacia</i>	Frost-proof, blooms, binds viable seeds, fructifies, gives single sowing on the treated or disturbed soil, a vegetatively mobile species.
<i>Sarothamnus scoparius</i>	Frost-proof, blooms and binds seeds irregularly, no samosev was observed.

Based on the sum of the points, the stability of the species in culture was determined and, accordingly, the prospects of growing in culture.

Summarized results of observations have shown for the above species the prospects of their introduction into the culture in the northern region of Belarus.

**Conclusion.** As a result of the studies, we recommended the following four very promising species for introduction into culture (not used earlier in the region): *Lathyrus laevigatus*, *Lathyrus niger*, *Trifolium fragiferum*, *Coronilla varia*.

In the conditions of culture for many species of the family. Legumes (*Lathyrus vernus*, *Lathyrus laevigatus* etc.) show an increase in overall productivity, an increase in the flowering period, and often an increase in decorativeness, which makes them promising for use as highly decorative plants in the practice of green construction. The introduction of protected plants into botanical gardens and introduction into culture prevents their

complete extinction and irreversible loss of valuable genetic material for plant growing and agricultural production.

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## THE AUKASA PROTECTED AREA IS NOT SPOT OF BIODIVERSITY IN GHANA

**D. Avouni**

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Biodiversity loss and conservation have been a global focus for at least two decades, mainly addressing issues of prioritization for efficient fund allocation. At the national and local levels where all biodiversity driving forces converge, and where conservation needs to be implemented, prioritization is often biased by parochialism due to poor data availability [2]. Over the past century, different human activities especially in agriculture have degraded Ghana's biological resources significantly. Exactly 80 years ago, 63% of the country's forests were in pristine or near-pristine condition in the forest zone [1]. Today, the landscape is mostly human-dominated with forest patches covering 15% of the country's land area. This is mainly due to land conversion to agriculture, a phenomenon which may continue to biodiversity losses until the economy grows and becomes less dependent on agriculture [4]. This trend can however be reversed, or at least stabilized, under land-use management regimes in which crop production is maximized with no significant losses to 682. Essentially, every efficient management plan is driven by quality agro-ecological data, and should gravitate towards increasing ecological complexity through the cultivation of multiple resource-efficient crop varieties under enhanced fertilization while allowing some less-competitive native flora. Like other African countries, Ghana lacks location and landscape-scale ecological data, a setback to biodiversity conservation [3].

The purpose of this work – analysis of the biodiversity in the Aukasa protected area

**Material and methods.** In the course of our work, the analysis and generalization of biodiversity in the Aukasa protected area. The comparative-comparative method, methods of generalization and analysis of flora and fauna in protected areas in the case of Ghana.

**Results and their discussion.** I would like to narrow my study to, the few protected areas in Ghana and how it should be managed.

Below are some few protected areas, which I will be elaborating on:

The Ankasa Conservation Area is an ancient rainforest and the most biodiverse in Ghana. It represents the only wet evergreen protected area in almost pristine state. As such its preservation is of paramount concern. Its importance for scientific study, environmental stability and educational and recreational purposes cannot be overstated. It is home to over 800 vascular plant species, forest elephants, leopard, bongo, chimpanzees and virtually all of the West African forest primates. It has an impressive avifauna, six hundred butterfly species and its network of streams is an important breeding ground for many of the fish species in the Eburneo-Ghanaian ichthyofauna region as well as being of immense importance for the biotic integrity of waters west and south of the Protected Area.

The major threat to the integrity of the Ankasa Protected Area comes from external pressures. Pressures that arise from the increasing human population, uncontrolled immigration and settlement, leading to a major change in land use with subsequent depletion and degradation of natural resources off-reserve. The off-reserve areas are governed by a plethora of national and local government institutions and traditional authorities. Arbitrated by, often, archaic legislation and conflicting, policies frequently developed in isolation of each other. The implementation of the laws and regulations are further constrained by a lack of both human and physical resources. The future integrity of Ankasa Protected Area relies on both developing a system through which these disparate players can interact and a programme of intervention involving resource input, training and education. This will enable and empower stakeholders to regulate their resource use efficiently. Therefore this management plan does not simply regard the Protected Area in isolation but rather takes a holistic approach and considers the Protected Areas position in the structure and economy of the District in which it constitutes a major asset.

**Conclusion.** With this regards, I would like to say, Ankasa conservation area is a highly ancient protected area and most biodiversity zone in Ghana. It is home to over 800 vascular plant species, forest elephants, leopard, bongo, chimpanzees and virtually all of the West African forest primates. It has an impressive avifauna, six hundred butterfly species and its network of streams is an important breeding ground for many of the fish species.

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## A CONTENT OF GLUCOSE IN HEMOLIMPH OF PULMONARY FRESHWATER MOLLUSCS WITH INFLUENCE OF ZINC AND LEAD SULPHATES (II)

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Any changes in the hydrochemical or hydrological regime of the reservoir significantly affect the homeostasis of organisms that live permanently in the aquatic environment. It is known, that aquatic organisms, concentrating trace elements, thus ensure the normal synthesis of biologically active substances such as enzymes, hormones and vitamins. However, a toxic one in the case of concentrations exceeding their normal content replaces the physiological effect in the body [1].

The purpose of the study was to investigate the effect of heavy metal salts (lead sulfate (II), zinc sulfate (II)) in varying concentrations on the glucose content in the hemolymph of pulmonary freshwater mollusks.

**Material and methods.** The experiments were performed on pulmonary freshwater mollusks of *L. stagnalis* (72 specimen) and *P. corneus* (72 specimen). Mollusks were gathered in autumn (September-October) in the reservoirs of the Vitebsk region.

Before the experiment for an acclimatization, the mollusks were kept in containers with standing tap water for 2 days, the density of the mollusk planting was 3 copies / 1, the water temperature was 20–22°C above zero, pH 7.2-7.7. 1/3 of its volume was replaced every day. The animals were fed on fresh dandelion leaves or a green salad.

Toxicological experiments were carried out using zinc and lead salts with the aim to model pollution of reservoirs with salts of heavy metals. The following salts of heavy metals were used in the experiments: zinc sulphate  $ZnSO_4 \cdot 7H_2O$  in a concentration of 0.05; 0.5 and 5.0 mg / l and lead sulfate  $PbSO_4$  at a concentration of 0.005; 0.05 and 0.5 mg / l.

Hemolymph in *P. corneus* and *L. stagnalis* was obtained by stimulating the leg with the needle from the syringe. The isolated hemolymph was collected by a mechanical pipette. Hepatopancreas was taken from the mollusks after taking the hemolymph. By mechanical action, the mollusk shell was crushed and the hepatopancreas was carefully separated from the connective and adipose tissue.

Determination of the glucose level in the hemolymph was carried out with a glucose oxidase method by the DiakonDiases kits [2].

Mathematical processing of the results was carried out using parametric and nonparametric statistics using a package of statistical programs Microsoft Excel 2003 and STATISTIKA.



**Results and their discussion.** Hepatopancreas is a source of glucose of hemolymph in mollusks. Metabolic processes in the body of mollusks are more intensive under the influence of salts of heavy metals, as evidenced by a reduction in the reserves of the most important energy substrate – glycogen.

When zinc sulfate (II) concentration of 0.05 mg / l occurs, the level of glucose in the hemolymph of pond food grows 2.4 times, and in coils 1.8 times, with exposure to zinc sulfate of 0.5 mg / l concentration in pond food glucose increases in 2,7 times, and in coils – 1,3 times, and with the action of zinc sulfate (II) concentration of 5,0 mg / l, the glucose level in the hemolymph of pond food grows 1.7 times, and the coils have a decrease in glucose in 1,6 times in comparison with the control group. There is a decrease in glucose level in the hemolymph of pond food in 1.4 and 1.6 times under the influence of zinc sulfate (II) in concentrations of 0.05 mg / l and 0.5 mg / l there is a decrease in glucose level in the hemolymph of pond food in 1.4 and 1.6 times, respectively, and in coils - in 3 and 2.2 times, respectively compared to the ZnSO<sub>4</sub> group, 5.0 mg / l (Table 1).

Table 1 – Effect of zinc sulfate (II) on glucose in the hemolymph *L. stagnalis* and *P. corneus* ( $M \pm m$ )

Groups (n=9)	<i>Lymnaea stagnalis</i>	<i>Planorbarius corneus</i>
Control	0,52 ± 0,14	0,974 ± 0,25
ZnSO <sub>4</sub> , 0,05 mg/l	1,25 ± 0,21*	1,785 ± 0,33*
ZnSO <sub>4</sub> , 0,5 mg/l	1,38 ± 0,11*	1,303 ± 0,24*
ZnSO <sub>4</sub> , 5,0 mg/l	0,89 ± 0,16*	0,598 ± 0,07

Note –\*P <0.05 compared with the control group

Under the influence of lead sulfate (II) with a concentration of 0.005 mg / l: the glucose level in the hemolymph of the ponders increase by 2.9 times, the level of glucose in the hemolymph does not change in the coils, the content of glucose increases by 1.2 times in the case of lead sulfate (II) with a concentration of 0.05 mg / l, while in coils it decreases by 1.4 times, and when lead sulfate concentration of 0.5 mg / l occurs, the glucose level in the hemolymph of pond food grows 2.5 times, and the coils have an increase in the glucose content by 1.3 times in comparison with the control group. Under exposure to lead sulfate (II) at a concentration of 0.05 mg / l: the level of glucose in the hemolymph of pond food is reduced by a factor of 2.4, while in coils exposed to PbSO<sub>4</sub>, 0.5 mg / l increases 1.3 times as compared with the PbSO<sub>4</sub> group 0.005 mg / l (Table 2).

Table 2 – Effect of lead sulphate (II) on glucose in the hemolymph *L. stagnalis* and *P. corneus* ( $M \pm m$ )

Groups (n=9)	<i>Lymnaea stagnalis</i>	<i>Planorbarius corneus</i>
Control	0,51 ± 0,14	0,97 ± 0,25
PbSO <sub>4</sub> , 0,005 mg/l	1,48 ± 0,23*	0,97 ± 0,35
PbSO <sub>4</sub> , 0,05 mg/l	0,61 ± 0,12*	0,68 ± 0,19
PbSO <sub>4</sub> , 0,5 mg/l	1,30 ± 0,33*	1,25 ± 0,35

Note – \*P <0.05 compared with the control group

**Conclusion.** Investigating the influence of lead sulphate (II) and zinc sulfate (II) in varying concentrations on the glucose content in the hemolymph *L. stagnalis* and *P. corneus*, it can be concluded that the heavy metal salts increase the glucose content in the hemolymph. The horn coil proved to be more resistant to the toxic effect of salts of heavy metals. Thus, zinc sulfate (II) and lead sulfate (II) cause metabolic changes in the body of mollusks, which are characterized by changes in carbohydrate metabolism.

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## IDENTIFICATION OF THE GROWTH FEATURES OF THE CANADIAN GOLDENROD DURING THE VEGETATIVE PERIOD

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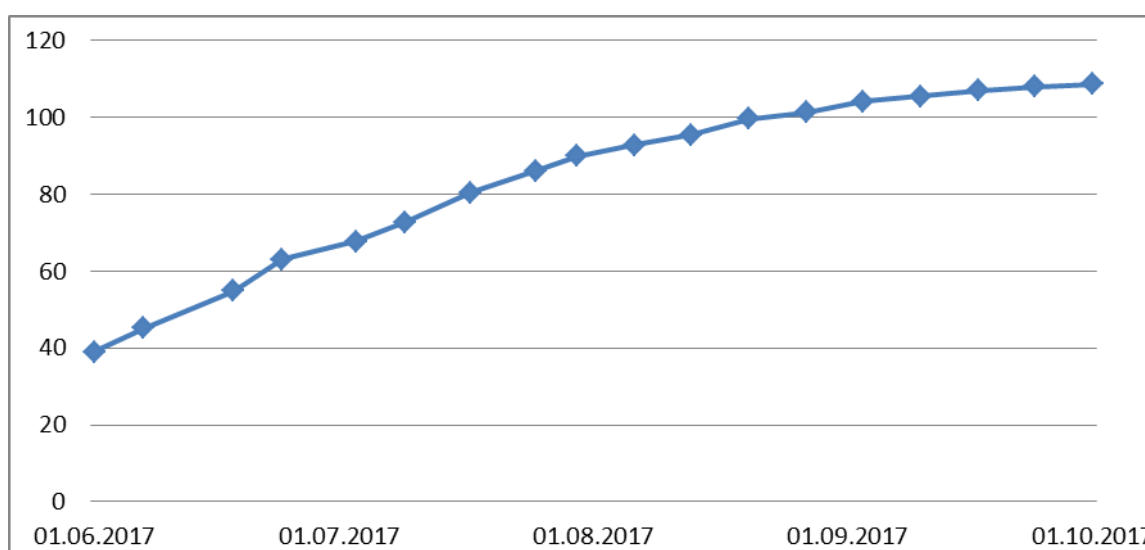
The Canadian goldenrod is a decorative plant, brought to Belarus in the 50<sup>th</sup> years of the 20<sup>th</sup> century [4]. *Solidago canadensis* L. can form tangles, reducing species diversity not only of the vegetation communities, but insect pollinators too. Also pollen of the goldenrod can cause allergic reaction in people, especially in children [3]. That's why the Canadian goldenrod is carried to moderately poisonous plants [1].

Roots of this plant contain substances-inhibitors, thanks to which *Solidago canadensis* L. forces out other species of plants in a short period of time. The Canadian goldenrod extends with a speed in several tens of hectares a year. For several years it is capable to bring meadows and edge sites to an unsuitable state, and these territories can't be used for mowing or a pasture of the cattle. In the autumn old stalks can become the reason of the fires [2].

The purpose of the work is to determinate Canadian goldenrod length and mass changing during the vegetative period.

**Material and methods.** For studying *Solidago canadensis* L. have been put 10 trial sites in Vitebsk (Bilevo district). The research was conducted during the period from June 18, 2017 to October 1, 2017. On these sites was fixed the length of the aboveground part of the plant, the phenological stage and the phytomass. The size of the cutting area – 1 square meter. Further material was weighed (wet weight), and then dried up on air and again weighed (dry weight).

**Results and their discussion.** The obtained values characterize the dynamics of the growth of the aboveground part of *Solidago canadensis* L. for 4 months.



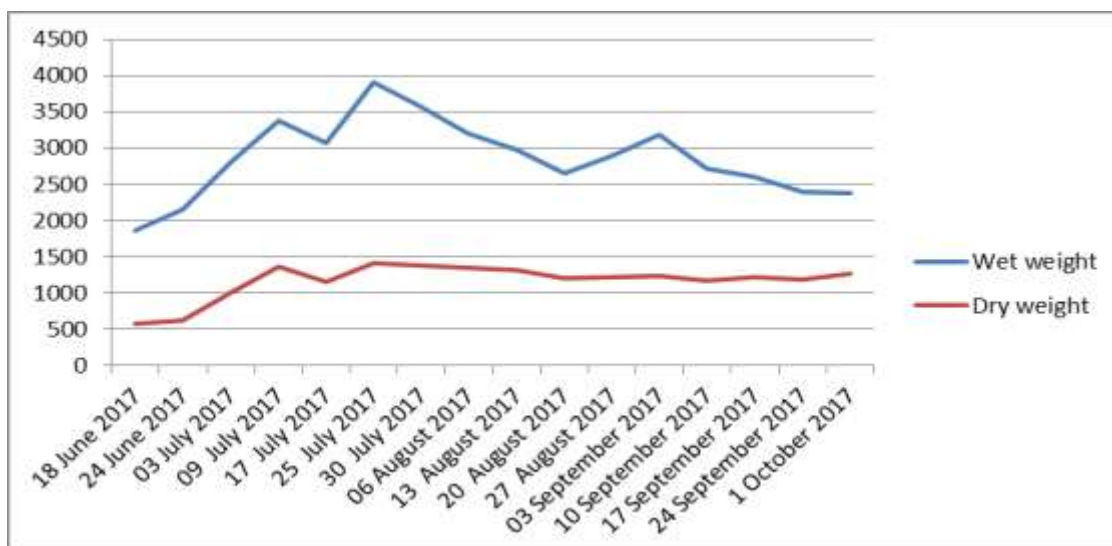
**Picture 1.1 – Plot of the aboveground part of the Canadian goldenrod growth.**

The growth in length of the goldenrod averages 4 centimeters a week for all studied period. Average length of the aboveground part of the Canadian goldenrod is reflected in the picture 1.1.

The measurement of the mass of plant material took place in 2 stages: immediately after cutting (wet weight) and after complete drying (dry weight). The results are provided in picture 1.2 in the form of two lines. On the abscissa (x) axis of the plot time intervals are shown (a step = 1 week) and on the ordinate (y) axis – values of weight in grams.

The plot reflecting the change in wet weight has several peaks: on July 9, on July 25 and on September 3. Dry weight increases rather gradually and reaches the maximum value on July 9 and on July 25. Such data are caused probably by much more high average temperatures during these periods of +21°C, +22°C and +23°C respectively.





**Picture 1.2 – Phytomass change of the Canadian goldenrod during the studied period.**

**Conclusion.** From the received results it is possible to draw a finding that in the first half of summer the Canadian goldenrod accumulates organic substance possibly for providing the period of blossoming and maturing of seeds. Then, after fructification, the amount of organic substance gradually decreases and the plant dies off.

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## **MORPHOMETRIC INDICATORS OF FRESHWATER PULMONARY MOLLUSCS WITH THE INFLUENCE OF CHEMICAL POLLUTION**

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Environmental factors and living organisms are closely interrelated with each other, allowing the possibility of assessing the habitat to study the characteristics of metabolism and external signs of living organisms.

Pulmonary freshwater molluscs are a convenient object for bioecological research, due to their availability, uncomplicated identification and widespread distribution. *Lymnaea stagnalis* L. and *Planorbarius corneus* L. are freshwater pulmonary gastropods that live in water with moderate water pollution [1].

Phenols are one of the most common contaminants that enter surface waters from industrial plants. In wastewater the content of phenols can exceed 5-10 g/l, and the maximum allowable concentration of phenols in drinking water and water of fishery water bodies is 1 mcg/l [2].

Purpose – to compare the morphometric parameters of *Lymnaea stagnalis* L. and *Planorbarius corneus* L. influenced by chemical contamination.

**Material and methods.** The experiments were performed on 72 pulmonary freshwater molluscs divided into two groups: 36 individuals of *Lymnaea stagnalis* L. and 36 individuals of *Planorbarius corneus* L. Molluscs collected in autumn (September-October) from river Vitba. There were 9 molluscs in each research subgroup.

To model the contamination of reservoirs by phenolic compounds, toxicological experiments were carried out using phenol. Phenol was added to the water with acclimatized molluscs at a concentration of 50, 100 and 150 mg/l. The duration of the acute experiment is 48 hours. The control was provided by individuals kept in tap water.

The measurements were carried out in the laboratory using a scale, a caliper, a glass pipette for 2 ml. In mollusca were measured the shell size, mass and volume of hemolymph. The morphometric measurement of the shells is carried out with a caliper, with an accuracy of 0.1 mm. Weighing of the molluscs was carried out before the haemolymph was collected [3].

Mathematical processing of the obtained results was carried out by the methods of parametric and nonparametric statistics using the package of statistical programs Microsoft Excel and STATISTICA 6.0. The reliability of the differences between the mean values in the samples was determined using Student's t-test.

**Results and their discussion.** 48 hours duration of the experiment does not affect to the height and width of the shell, but affects the volume of the hemolymph and the mass of mollusca.

Phenol has a toxic effect on freshwater gastropods, causing a number of rapid physiological (enveloping mucus, reducing the volume of hemolymph, etc.) and behavioral reactions (motor and eating disorders).

By determining the morphometric parameters of pulmonary freshwater molluscs influenced by phenol in various concentrations, the following data were obtained (Tables 1–2).

Table 1 – Morphometric parameters of *Planorbarius corneus* L. living in natural reservoirs under the influence of chemical pollution (M ± m)

Phenol concentration	Height, cm	Width, cm	Mass, g	Hemolymph's volume, ml
Control group	2,40±0,05	3,08±0,04	6,52±0,28	1,01±0,06
Phenol 50 mg/l	2,56±0,06	3,09±0,13	4,23±0,19*	0,66±0,07*
Phenol 100 mg/l	2,33±0,05	2,88±0,05	4,84±0,19*	0,58±0,04*
Phenol 150 mg/l	2,18±0,05	2,72±0,06	4,48±0,29*	0,53±0,03*

Note – \* p<0.05 compared with the control group

Statistically significant differences were obtained by examining the volume of hemolymph in *Planorbarius corneus* L. at a concentration of 50 mg / l–1.5 times, 100 mg / l–1.74 times and 150 / l–1.9 times (Table 1).

Table 2 – Morphometric parameters of *Lymnaea stagnalis* L. living in natural reservoirs under the influence of chemical pollution (M ± m)

Phenol concentration	Height, cm	Width, cm	Mass, g	Hemolymph's volume, ml
Control group	4,74±0,07	1,80±0,06	7,87±0,53	1,68±0,16
Phenol 50 mg/l	4,56±0,19	1,68±0,11	5,38±0,33*	1,18±0,07*
Phenol 100 mg/l	2,62±0,06*	1,63±0,05	3,72±0,31*	0,91±0,05*
Phenol 150 mg/l	4,26±0,23	1,69±0,05	5,73±0,25*	0,92±0,05*

Note – \* p<0.05 compared with the control group

In *Lymnaea stagnalis* L., a decrease in the volume of hemolymph happen at the concentration of 50 mg/ l–1.4 times, 100 mg/ l–1.85 times and 150 mg/ l–1.8 times.

The adaptation of molluscs to the toxic environment is accomplished by transition from an aerobic digestion of glycogen to an anaerobic one, which is accompanied by decrease in the level of oxygen consumption and a decrease in the activity of respiratory enzymes.

The transition from aerobic respiration to anaerobic explains the increase in the density of the hemolymph in molluscs exposed to phenol. The increase in density can be caused by the accumulation of lactic acid formed during the process of glycolysis in the hemolymph.

**Conclusion.** Analyzing the morphometric parameters of molluscs standed in solutions with different concentrations of phenol, it was found that the obtained data on the volume of hemolymph in the experimental groups statistically significantly differ from the control group. This fact can be used in the ecological monitoring of surface waters. Thus, according to the morphometric parameters of molluscs from different reservoirs, one can judge the degree of their contamination relative to each other.

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## **CONTENT OF ASCORBIC ACID IN ALCOHOL EXTRACTS OF EARLY-FLOWERING PLANTS**

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Early-spring plants have developed a complex of the adaptations promoting preservation and the maximum use of heat at his shortcoming and resistance to overheating as a result of strong sunlight, high temperature of a substratum and to an insufficient amount of precipitation. Biomorphological adaptations of early-spring early-flowering plants are a complex component of their adaptation to conditions of their existence [1]. One of factors promoting this adaptation is the high content of ascorbic acid in fabrics of early-flowering plants, so in leaves of a bear leek contain up to 0,73%, in bulbs – up to 0,10%, in flowers and leaves of a primrose – up to 500 mg of % Ascorbic acid inactivates free radicals, forming an inactive radical and is a cofactor of ascorbateperoxidase [2].

The work purpose – to reveal differences in the content of ascorbic acid in alcohol extracts of early-flowering plants

**Material and methods.** The research of concentration of ascorbic acid was conducted in from vegetative and generative bodies of early-flowering plants. Determination of the quantitative content of ascorbic acid was carried out by a spektrofotometrichesky method at a wavelength of 265 nanometers. The maintenance of ascorbic acid is expressed in mkg/g of crude weight [2].

Mathematical processing of the received results was carried out by methods of parametrical and nonparametric statistics with use of a package of the statistical Microsoft Excel 2003, STATISTICA 6.0 programs.

**Results and their discussion.** Follows from table 1 that the largest content of ascorbic acid was observed in leaves of *Allium ursinum L.* and *Allium schoenoprásum*, at *Primula officinalis* – in flowers. The maintenance of this index is higher in plant material in comparison with extracts. In extracts of 70% of alcohol the maintenance of ascorbic acid is higher than 40% of alcohol in comparison with extracts.

Table 1 – The maintenance of ascorbic acid of mg/g in vegetative and generative bodies of early-flowering plants ( $M\pm m$ )

Plant object	Organ of the plant	Objects of research		
		Botanical garden (Vitebsk)	70% alcohol extract	40% alcohol extract
<i>Allium ursinum</i>	Leaves	23,12±0,15 <sup>6</sup>	21,08±0,14 <sup>6</sup>	19,10±0,13 <sup>6</sup>
	Stalks	17,36±0,11 <sup>6</sup>	16,45±0,15 <sup>6</sup>	12,38±0,12 <sup>6</sup>
	Roots	15,16±0,15 <sup>1,2,6</sup>	13,28±0,11 <sup>1,2,6</sup>	11,05±0,13 <sup>1,2,6</sup>
<i>Allium schoenoprasum</i>	Leaves	10,92±0,11 <sup>1,6</sup>	9,36±0,10 <sup>1,6</sup>	7,33±0,06 <sup>1,6</sup>
	Stalks	8,68±0,12 <sup>4,6</sup>	7,35±0,11 <sup>4,6</sup>	6,18±0,14 <sup>4,6</sup>
	Roots	7,34±0,14 <sup>3,5,6</sup>	7,02±0,10 <sup>3,5,6</sup>	5,22±0,11 <sup>3,5,6</sup>
<i>Primula véris</i>	Flowers	98,25±0,49 <sup>1-5</sup>	82,33±0,26 <sup>1-5</sup>	66,68±0,57 <sup>1-5</sup>
	Leaves	77,03±0,67 <sup>1,6</sup>	75,11±0,42 <sup>1,6</sup>	61,24±0,25 <sup>1,6</sup>
	Stalks	27,12±0,26 <sup>2,5,6</sup>	24,16±0,32 <sup>2,5,6</sup>	17,98±0,16 <sup>2,5,6</sup>

The note – <sup>1</sup>P < 0,05 in comparison with leaves of *Allium ursinum*; <sup>2</sup>P < 0,05 in comparison with stalks of a *Allium ursinum*; <sup>3</sup>P < 0,05 in comparison with roots of a *Allium ursinum*; <sup>4</sup>P < 0,05 in comparison with leaves of an *Allium schoenoprasum*; <sup>5</sup>P < 0,05 in comparison with stalks of an *Allium schoenoprasum*; <sup>6</sup>P < 0,05 in comparison with flowers of a *Primula véris*.

Statistically significant results are received when comparing leaves of *Allium ursinum* with the roots *Allium ursinum* (in leaves the maintenance of ascorbic acid is 1.59 times more larger), with leaves *Allium schoenoprasum* and the roots *Allium schoenoprasum* (in leaves the maintenance of this index is 1,33 times more), with stalks of *Primula officinalis* and leaves of *Primula officinalis* (in leaves the maintenance of this index is more in 3,11); when comparing maintenance of ascorbic acid in the roots *Allium ursinum* with the roots *Allium schoenoprasum* (in the roots *Allium ursinum* the maintenance of this index is 1,89 times more); when comparing maintenance of ascorbic acid in stalks of *Primula officinalis* is 3,29 times more larger in comparison with *Allium schoenoprasum* and by 1,47 times in comparison with *Allium ursinum*.

**Conclusion.** Thus, the maintenance of ascorbic acid depends on type of body and on concentration of alcohol (70% and 40%) in extracts. In extracts of 70% of alcohol concentration of ascorbic acid is higher than 40% of alcohol in comparison with extracts. High content of ascorbic acid is noted in extracts (70%) of *Primula officinalis* flower.

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**THE USE OF THE ELECTRONIC DATABASE FOR THE ANALYSIS  
OF SPREADING THE SPECIES OF CABBAGE FAMILY  
(*BRASSICACEAE*) IN BELARUSIAN POOZERIE**

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The increase in the average annual air temperature in Belarus by 1,1 degrees has led to the shift of agroclimatic zones from the South to the North for about 100-120 kilometers. The northern agroclimatic area has broken up and in Polesia (the South of Brest and Gomel regions) has appeared a new one. It is characterized by warmer winter and summer periods and also by a long vegetative period [1].

Due to the warming of the climate the change of areal borders is noted and the extinction of cold-resistant and hygrophilous species from the floral cover is possible, i.e. natural florogenesis is observed.

A focused study of the Cabbage family (*Brassicaceae*), followed by the entry in the database of Microsoft Office Access was first held in the herbarium of the Fund VSU named after P. M. Masherov and in the personal herbarium collection of I.I. Shimko. The obtained data would be possibly used in further educational and scientific process, in the edition of multivolume Flora of Belarus and the Red Book of the Republic of Belarus.

The aim of this work is to use the electronic database created by us to summarize the data of the distribution of the representatives of the Cabbage family in the administrative districts of the Vitebsk region.

**Material and methods.** As research material we used the samples of the Cabbage family (*Brassicaceae*) submitted in the herbarium of the Fund VSU named after P. M. Masherov, in the private collection of I. I. Shimko and in a private herbarium fees. And also the electronic database of Microsoft Office Access was used. Were conducted collecting and gerbarizing samples of the Cabbage family (*Brassicaceae*), work with the electronic Microsoft Office Access database. Using the results of the research the first electronic database of Microsoft Office Access [2; 3; 4] was made.

**Results and their discussion.** The Microsoft Office Access database gives the chance to edit put in data. There is a possibility of creating a complete catalogue of inventory of existing collections and also a possibility of printing standard labels. And also gives the chance to carry out the analysis of flora of this or that territory, in particular, the distribution according to administrative regions.

Using the created electronic base, we analyzed the degree of the study of Cabbage in the Belarusian Poozerye in administrative regions (table 1). It is proved that the main areas of collecting are – Vitebsk (37, 34%), Shumilino (17,82%) and Gorodok (14,07%), the districts of Vitebsk region. In the

herbarium of VSU named after P. M. Masherov at the time of the study there are no charges from Lepel, Tolochin, Chashniki regions and it is a guide to active study of the flora of these administrative districts.

Table 1 – The degree of knowledge of Cabbage in the Belarusian Poozerye by administrative districts

№	District Vitebsk region	The Number of herbarium specimens	%
1	Beshenkovichi	5	0,94
2	Braslav	12	2,25
3	Verkhnedvinsk	6	1,13
4	Vitebsk	199	37,34
5	Glubokoye	8	1,50
6	Gorodok	75	14,07
7	Dokshitsy	30	5,63
8	Dubrovno	1	0,19
9	Lepel	0	0
10	Liozno	14	2,63
11	Miory	1	0,19
12	Orsha	4	0,75
13	Polotsk	17	3,19
14	Postavy	2	0,37
15	Rosson	2	0,37
16	Senno	33	6,19
17	Tolochin	0	0
18	Usha	1	0,19
19	Chashniki	0	0
20	Sharkovshchina	2	0,37
21	Shumilino	95	17,82

**Conclusion.** The analysis of knowledge shows that many areas of the Belarusian Poozerye have been studied insufficiently, that's why it is advisable to carry out research work in these areas. It is necessary to carry out floristic studies and herbarium collecting involving students that will allow you to get a more comprehensive picture of distribution the representatives of this family in the Belarusian Poozerye.

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## **ANALYSIS OF THE PATHOLOGY OF CARBOHYDRATE METABOLISM**

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The relevance of the study is determined by the necessity of systematization and understanding of the material on disorders of carbohydrate metabolism, their causes and diagnostics. This problem is of scientific importance since the identification of patients with early disorders of carbohydrate metabolism and prevention is of great medical and social importance. As with proper screening in patient groups that have high probability of violations of carbohydrate metabolism, effective for primary prevention of diabetes type 2 in the stage of pre-diabetes can significantly reduce macro - and microvascular complications [1, 2].

The purpose of the study: to establish the prevailing disease of carbohydrate metabolism and to analyze their detection among female and male population.

**Material and methods.** To work used data of the anamnesis of patients and results of clinical and biochemical tests of their blood and urine to me “Vitebsk city polyclinic № 6”. The analysis was performed using descriptive and analytical statistical methods.

Health care institution Vitebsk City Polyclinic number 6 serves a population of 42,560 people (2015). Every year in the laboratory of the polyclinic conducted more than 100,000 analyses. The bulk of the research falls on the General blood and urine, determination of blood glucose with a load and without. A shift is about 80 analyses to determine blood sugar. The number of outpatient visits to the doctor endocrinologist for 2015 amounted to 9023.

**Results and their discussion.** For 3 years held clinical and biochemical examinations of the patients served by the hospitals from 2013 to 2015. The studies revealed violations of carbohydrate metabolism in 13% of patients in



2015. In 2014, the figure was 12% and in 2013 by 11%. Studies have shown that the pathology of carbohydrate metabolism increased by 1% per year.

Among the disorders of carbohydrate metabolism more frequently diabetes mellitus type 2, and nodular goiter (figure 1).

This is due to the age of the patients. Disorders of carbohydrate metabolism, developed after more than 40 years. In this case, heredity is of great importance. In addition, the risk of disease increases for obesity, atherosclerosis and high blood pressure, the presence of harmful habits.

The growth of such diseases as acquired hypothyroidism. According to statistics, hypothyroidism in women the most common – 9 women out of 1000, while among men this figure is only 1 out of 1000.

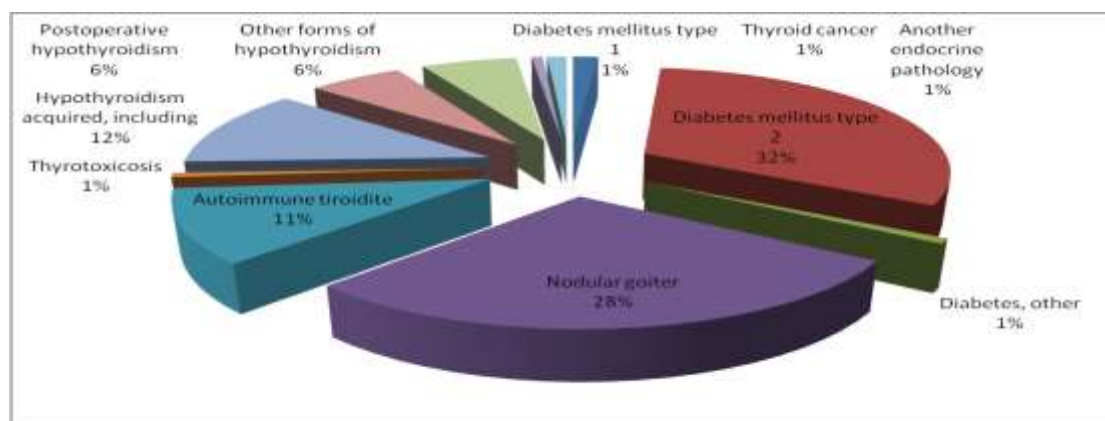


Figure 1 – Basic carbohydrate metabolism abnormalities in patients of me “Vitebsk City polyclinic № 6” for 2015.

In 2015, for detection of disorders of carbohydrate metabolism directed and examined 10828. The number of women put on the account at the endocrinologist, amounted to 5220, the number of men – 1050 (figure 2). In 2014, those percentages 4693 women, men 894. In 2013, of the women studied 4293 was put on the account at the endocrinologist, and men 793 человека. From the data obtained it is seen that the number of women seeking help and who were registered increases for the year by approximately 450 people, and men about 100 people.

Such prevalence of diseases are associated with the number of women served by the institution, and consisting on the account at the endocrinologist. In the study, it was noted that women are better about their health. Annually undergo examinations and visits to doctors.

To date, it is not only secondary prevention of complications of diabetes, but the detection of early disorders of carbohydrate metabolism, estimation of the risk of developing and carrying out measures aimed at primary prevention of diabetes.

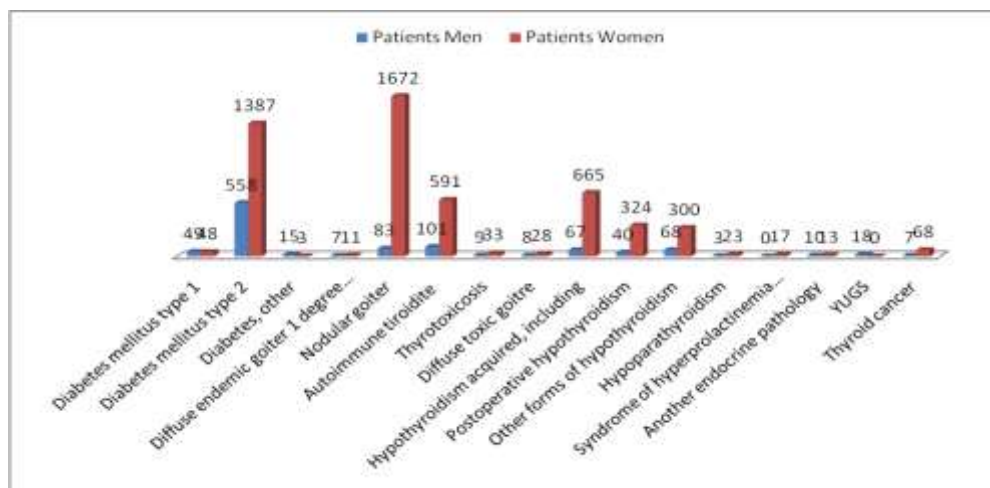


Figure 2 – The prevalence of the disease among women and men in 2015.

To detect early disorders of carbohydrate metabolism in primary care can apply scale prediction of diabetes and test glucose tolerance. Early disorders of carbohydrate metabolism should be examined in individuals belonging to high risk group.

**Conclusion.** The results can be seen that the number of pathology violations of carbon-water exchange is rapidly increasing. The share of diagnostics of violations of carbohydrate metabolism accounts for 27% of all of the research conducted in clinical and biochemical laboratories. A greater number of pathologies have on the female population -83% of the identified diseases in males – 17%.

Thus, the detection of violations of carbohydrate metabolism is an important area of primary prevention of diabetes. Further research will be continued and aimed at the study of diabetes complicated by diabetic nephropathy in the adult population.

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**INVENTORY AND ANALYSIS OF THE COLONIES  
OF HERACLEUM SOSNOWSKYI'S CONDITION  
ON THE TERRITORY OF LYOZNENSKY DISTRICT WITH GIS**

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As a result of anthropogenic activities on our planet, many species of animals and plants migrate. At the same time, part of the migrations leads to serious environmental, social and economic consequences. There is a

struggle against alien species of flora and fauna that oppress or destroy native species of Belarusian territory. This process starts the Convention on Biological Diversity, signed in 1992 in Rio de Janeiro.

Purpose – the creation of GIS for customers and conducting on its basis an inventory of habitats and a primary analysis of the *Heracleum sosnowskyi*'s condition in the Liozno district (Vitebsk region).

**Material and methods.** Analysis of funds and literature sources, observation, cartographic, geoinformation, statistical data processing, comparative analysis, remote sensing.

As a basis for creating a custom GIS, we chose the MapInfo Professional platform, which has all the standard characteristics of this kind software, is easy to use and is an excellent tool for analyzing the distribution of *Heracleum sosnowskyi* colonies.

Geographic Information System (GIS) is a computer system that allows you to display data on an electronic map and analyze them.

The initial materials for the project's implementation are:

- Data of field survey on the territory of the Liozno district.
- Space and aerial photography data, the Land Information System of the Republic of Belarus, cartographic materials.
- Thematic reports of regional resource and environmental protection committee, executive bodies of local authorities, agricultural and other enterprises, statistical data.

Based on the primary results obtained was designed a database. The basis for the database was the classifier for the GIS "Invasive species of the Vitebsk region". This classifier containing detailed information about each colony: location, photographs, date of examination, condition and size at the time of the survey, land type and recommendations for controlling invasive species.

Based on this classifier and the generated database was created GIS for customers that allows:

- store an unlimited amount of information about the problem's state;
- carry out an operative (if necessary, interactive) updating of data using any information sources ( network resources, satellite navigation data, expeditionary studies, etc.);
- analyze data with the help of powerful built-in tools or connecting most of the currently available software resources for processing statistical information and graphics;
- present the data and results of their analysis in any convenient format (maps, graphs, charts, tables, text), formulate standardized reports on the problem's state;
- promptly provide the necessary information to state and business organizations on the basis of a system of requests and connect GIS to network resources.

**Results and their discussion.** Data's final processing was carried out using the analytical tools of the MapInfo Professional platform. We also used the possibility of GIS to connect more familiar software products (MS Excel), which differ in their availability and ease of use for constructing graphs, charts, and pivot tables.

The analysis of Liozno district helps us to make the following conclusions:

1. about 95,88% of the land are agricultural purposes, about 1,17% are the affected areas are the lands of settlements, 2,18% are the mini-municipal waste and only 0,77% are land along roads and roadside belts;

2. 67,63% of colonies dominate the occupied territory, 14,4% of colonies progress, 16,52% have some degree of depression, the remaining 1,44% are stable;

3. about 25% of cases invasive plants are destroyed by mowing, about 1% by herbicide and plowing, and the struggle with other colonies is not conducted;

4. the main recommendations for control in 77,41% of cases are based on regular cropping and plowing in combination with the use of herbicides, also in 19,35% – it is possible to use the technology of crop rotation and only 3,22% – mowing;

5. colonies of *Heracleum sosnowskyi* can expand their space for 15–20% in near future if the spread preserve as at this time

The obtained data of the Liozno district were transferred to the Vitebsk Regional Committee for Nature and Natural Resources Protection, the Institute of Experimental Botany named after V.F. Kuprevich National Academy of Sciences of Belarus"; included in the database of the Republic of Belarus' ZIS and make a basis for the development of planned measures to combat invasive species in the areas of the Vitebsk region.

**Conclusion.** The creation of customs thematic GIS is a progressive method for conducting research, which allows solving many practical problems without attracting large investment resources, and optimizes labor costs.

## THE ACTIVITY OF CATALASE IN HEPATOPANCREAS

### *Planorbarius corneus*

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At the present time for assessing the status of ecosystems using the methods of biological indication. While great attention is paid to the use for these purposes of live objects. As such objects, using freshwater mussels. Working with them is less time consuming and the most expedient in economic terms. The study of biochemical parameters of these organisms

give us a theoretical basis for the qualitative assessment of the system under investigation [1]. Widely used one of the most common types of pulmonary mollusks – coil horn (*Planorbarius corneus*).

The aim of this work was to determine activity of catalase in hepatopancreas *Planorbarius corneus* depending on season and habitat.

**Material and methods.** The experiments were conducted on 324 pulmonary freshwater molluscs, divided into two groups: 162 individuals of *Lymnaea stagnalis* and 162 individuals of *Planorbarius corneus*. Molluscs were gathered in the spring (April-may), summer (July) and autumn (September-October) from reservoirs in six districts of the Vitebsk region (table 1). The water bodies of selected districts were at a distance of no more than 30-40 km from the regional center. In each study subgroup was kept for 9 molluscs.

Table 1 – sampling sites of water, soil and shellfish.

District shellfish molluscs	Gathering place	Pond
Vitebsk district	Vitebsk	the river Vitba
Dubrovensky district	the village Lyady	lake Mordovia
Beshenkovichi district	the village Sokorove	Small lake
Ushachi district	the village Dubrovka	lake Dubrovskoe
Shumilino district	a/g Tower	lake Budapest
Senno district	Senno	lake Sennenskoe

The catalase activity of hepatopancreas were determined by spectrophotometric method. The hepatopancreas homogenate was centrifuged for 20 minutes at 3000 rpm (4<sup>0</sup>C) and diluted to a dilution of 1:150 (40 µl of homogenate+160 mkl 0,025 Tris-HCl buffer), to 0.2 ml homogenate were added to 2.0 ml of 0.03% H<sub>2</sub>O<sub>2</sub>. Incubated 10 min at room temperature. Was added 1.0 ml of molybdate ammonium. Measured optical density at a wavelength of 410 nm against distilled water. Control sample contained everything except the homogenate, which was used instead of 0.2 ml of distilled water [2]. Mathematical processing of obtained results was carried out by methods of parametric and nonparametric statistics using statistical software package Microsoft Excel 2003, STATISTICA 6.0.

**Results and their discussion.** After the study *Planorbarius corneus* collected at different times of the year shellfish, indicators are aggregated and listed in table 2.

Table 2 – Activity of catalase activity (µmol/g) in hepatopancreas tissue of pulmonary mollusks of the genus *Planorbarius corneus* ( $M\pm m$ )

District shellfish district	The season of the year		
	Spring (n=9)	Summer (n=9)	Autumn (n=9)
Vitebsk district	82,4±1,4 <sup>1,2</sup>	31,2±1,2	52,3±1,3 <sup>1</sup>
Dubrovensky district	64,5±2,1 <sup>1,2</sup>	27,4±1,4	48,6±1,7 <sup>1</sup>



Beshenkovichi district	70,9±2,3 <sup>1,2</sup>	29,5±1,3	57,3±2,0 <sup>1</sup>
Ushachi district	78,7±7,6 <sup>1,2</sup>	29,7±1,8	49,8±2,4 <sup>1</sup>
Shumilino district	67,4±2,8 <sup>1,2</sup>	26,7±3,8	47,8±1,7 <sup>1</sup>
Senno district	69,5±1,6 <sup>1,2</sup>	28,7±1,2	48,8±1,4 <sup>1</sup>

Note – <sup>1</sup>P<0,05 in comparison with summer period, molluscs district; <sup>2</sup>P<0,05 in comparison with the autumn period, molluscs district

In comparison with the summer period of collection of the molluscs increased activity of catalase in the spring 2.64% Vitebsk district, 2.35 times the dubrovensky district, 2.41 times the Beshenkovichi district, 2.65 times Ushachi district, 2.52 times Shumilinsky district, 2.42 times Senno district. In comparison with the summer period of collection of the molluscs increased activity of catalase in the autumn 1.68% Vitebsk district, 1.77 times the Dubrovensky district, of 1.94 times the Beshenkovichi district, 1.68 times Ushachi district, 1.79 times Shumilinsky district, 1.7 times Senno district. Compared with the autumn period of activity of catalase coil horn with a spring period of statistically significant differences obtained in the Vitebsk region 1.58 times, Dubrovno district of 1.33 times, Beshenkovichi district 1.24 Shumilinskiy district of 1.41 times in Ushachi 1.58 times, Sunanskom district 1.42 times (table 2).

**Conclusion.** The study identified a pattern. Namely: catalase activity prevails in the cold season. Catalase is an enzyme that destroys free radicals of the peroxide of hydrogen produced during the different oxidation processes. Therefore, in the cold season the molluscs are experiencing oxidative stress, in which stands out an excessive amount of hydrogen peroxide, the neutralization of which occur due to the increase of catalase activity.

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**QUANTITATIVE DETERMINATION OF THE FLAVONOID AMOUNT IN LEAVES OF *Taraxacum officinale* DEPENDING ON CONDITIONS OF DISEASE**

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Currently, for the treatment of various diseases, biologically active substances of vegetable origin, which have a lesser side effect than synthetic preparations and are similar in structure and action to the natural components of the human body, acquire great importance. Dandelion officinalis



(*Taraxacum Officinale*) has long been used in folk medicine. In the literature, its wound-healing, choleric, antipyretic and antispasmodic properties are noted [1, 2, 3]. To date, the state pharmacopoeia of the Republic of Belarus describes only the roots of dandelion drug. But the above-ground part of this plant is also widely used abroad [1, 2]. It is known that the leaves of dandelion drug contain a lot of biologically active substances, for example, flavonoids, phenolic compounds, pigments [3, 4]. But information about the study of the chemical composition of dandelion leaves of medicinal plants growing on the territory of the Republic of Belarus is limited. *Taraxacum Officinale* is widely distributed and has a high growth rate of the aerial part. Consequently, this raw material is cheap and affordable. Therefore, the study of biologically active substances obtained from the leaves of a given plant is an important and urgent problem [4, 5].

Goal – to determine the quantitative content of the amount of flavonoids in dandelion leaves collected in a mixed forest and in a meadow near the Western Dvina River.

**Material and methods.** The material of the study is the leaves of the dandelion, collected in the spring of 2017 in the village of Ulanovichi, Vitebsk region. The raw material was harvested on two sites: a mixed forest (in the shade) and a meadow near the Western Dvina River (a well-lit section).

**Results and their discussion.** Sites with different lighting conditions are not chosen by chance. Sunlight is one of the factors influencing the accumulation of flavonoids in leaves [2].

The quantitative determination of the sum of flavonoids was carried out according to the following procedure. To 0.5 g of the feed was added 10 ml of 96% ethanol, left to stand for 24 hours, filtered through a paper filter. The extract was poured, the material was poured into 10 ml of 70% ethanol, placed on a water bath for 30 minutes. The extracts were combined, adjusted to 70 ml with ethanol to 10 ml. To 0.1 ml of recovery, 5 ml of a 0.05 M solution of aluminum chloride in ethanol was added, left for 30 minutes. The optical density of the extracted extracts was measured at a wavelength of 410 nm. As a standard, a 0.05 M solution of aluminum chloride in ethanol was used [5, 6].

Further, according to the formula, the content of the sum of flavonoids in percent (in terms of quercetin glycosides) was calculated [6]:

$$X=(E \cdot V_1 \cdot V_2 \cdot 100)/(V_3 \cdot m \cdot (100-W) \cdot \varepsilon),$$

where X – content of sum of flavonoids,%; E – is the optical density of the test solution;  $\varepsilon$  – is the specific absorption index of quercetin glycosides in a complex with aluminum chloride in ethanol (at a wavelength of 410 nm), equal to 330;  $V_1$ – is the volume of the extract, ml;  $V_2$  – volume of the solution for spectrophotometry, ml;  $V_3$  – is the volume of the extract taken for determination, ml; M – is the mass of the raw material, g; W – is the loss in mass when the raw material is dried,%.

Among the various compounds that determine the therapeutic effect of plants, flavonoids occupy a significant place. These natural compounds have many biologically active properties – antioxidant, antimicrobial, vasoconstrictive, cardiogenic, hypotensive, antiulcer, wound-healing, antipyretic and astringent actions. In this case, flavonoids are not toxic to humans in any way of administration. One of the valuable properties of flavonoids is their positive effect on liver function: they strengthen bile secretion, improve its detoxifying ability in relation to substances such as barbiturates, arsenic.

The results of quantitative determination of the amount of flavonoids in dandelion leaves are shown in the table.

Table – Results of quantitative determination of the amount of flavonoids in the leaves of *Taraxacum officinale*

Place of collection	X %
Mixed forest	0,64±0,09*
The bank of river Western Dvina	2,49±0,25*

The content of total flavonoids in the leaves of dandelion, collected in the mixed forest, is 0.64±0,09%. The content of total flavonoids in the leaves of dandelion, collected on the banks of the river Western Dvina is a 2.49±0,25%.

As can be seen from the table, the content of the amount of flavonoids is significantly higher 3.89 times in the leaves of a dandelion collected on the river bank.

This is due to the different lighting mode. Sunlight is one of the factors that influence the accumulation of flavonoids in the leaves. The plants are in a well lit area, accumulate a large number of flavonoids. For plants located in the shade, these figures are low.

Thus, the total content of phenolic compounds allows to detect connection with a specific ecological environment, the impact of which is determined by the nature moisture, and light.

The quantitative content of total flavonoids in the leaves of dandelion, collected in the mixed forest and in a meadow near the river Western Dvina. Raw materials collected in well-lit areas provide 3.89 times more flavonoids than raw materials collected in the shade.

Analysis of literature data indicates that the flavonoids contained in the leaves of dandelion drug promote wound healing and erosion. Extracts obtained from dandelion leaves can be applied externally (in dentistry, dermatology, otorhinolaryngology) and inward (treatment of diseases of the gastrointestinal tract).

Extracts from such affordable and inexpensive raw materials can be used in the manufacture of cosmetics (toothpastes, lotions for problem skin

care). Spasmolytic and choleric effect of flavonoids of this plant can be used in the treatment of diseases of the liver and gall bladder.

**Conclusion.** As shown in this work, the harvesting of medicinal raw materials from the leaves of the dandelion, it is advisable to collect plants in well-lit areas, as they the total content of flavonoids is higher.

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## ASSESSMENT OF THE NATURAL POTENTIAL OF THE PSKOV REGION FOR THE DEVELOPMENT OF A NETWORK OF PROTECTED AREAS

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The solution of problems related to the optimization of nature management is now extremely important for any region striving to preserve and develop its rich natural and cultural heritage. Unfortunately, on the whole, the conservative system of protection of natural areas has not justified itself. The existing specially protected natural areas have never become organic parts of the Russian economy and the culture of Russian society.

The purpose of this work is to assess the natural potential of the Pskov region of the Russian Federation for optimization and development of a network of protected natural areas.

**Material and methods.** The main objectives of the work involves the assessment of existing in the region of protected areas and identified s sites

potentially suitable for the expansion of the protected area network. Pskov region is one of the most ecologically clean regions not only in North-West Russia, but throughout Eastern Europe. However, there are natural-ecological framework of the region is far from perfect as it does not form a science-based network of protected areas, and represented a kind of scattered sites in the north-west, south-western and eastern parts of the region.

**Results and their discussion.** In north-west of the area is located Ramsar wetland of international importance “Pskov-Chudskaya lakeside lowland”. It is located within the Pskov and Gdov administrative districts. This protected area is one of the most valuable reserves in the entire Baltic region of rare species of plants and animals, including species included in the Red Data Books of Russia, Estonia and the Pskov Region.

Within Pskov-Chudskoy Priezernaya lowland is a specially protected natural territories of federal value-State Zoological Reserve “Remdovsky”, created in 1985. This reserve was established for the preservation, restoration, reproduction and rational use listed in the Red Book of the Russian animal species protected under international agreements, preserve their habitats, migration routes, nestingsites, with the overall ecological balance escort. State “Polistovsky” nature reserve is located in the eastern part of the Pskov region. This reserve was created in 1994 to preserve and study the natural course of natural processes and phenomena, the gene pool of flora and fauna, communities and individual species of plants and animals, typical and unique ecosystems. There is marked the largest known in Europe, the local population and the curlew, home to some species of birds, endangered species: golden plover, European and black-throated diver, osprey and other. Territory Polistovsky Reserve is considered the standard, as is virtually unaffected by economic activities section.

In the south of the area it is based "Sebezhsy" National Park in 1996. It was created to preserve a unique natural complex, which has a special ecological, historical and aesthetic value. Local forests are a mixture of taiga and deciduous forests with a rich animal world. In the park there are many rare species of plants and animals. Here there are 204 species of birds, more than ten of them are included in the Red Book of Russia: white-tailed eagle, great and lesser spotted eagle, eagle-serpent eagle, Central Russian ptarmigan, black-throated diver, and others. In the Pskov region major protected areas are concentrated in Gdov, Sebezh, Bezhanitsy areas. Here protected natural areas occupy from 13 to 19% of the area. On the other hand, in some areas (Plyussky, Krasnogorodsk, Palkino, Pytalovsky, Kuninsky, Novosokolniki, Usvyaty) there was a complete absence of specially protected, territorial. Protected natural objects have been eradicated in recent decades. Often the initiators of such liquidation of the conservation status of natural monuments are private entrepreneurs and local authorities. In order for protected natural areas to form a well-grounded ecological framework of

the Pskov region, many of them need to restore the status of protection, or create new ones. They need protection Kudeversky picturesque landscape – a wonderful place Bezhanitsy hill, a unique landscape of its expressiveness. Here, the picturesque lakes of the lakes alternate with high hills, called “mountains”. Among these mountains frontal and Lipnitskaya considered the highest point of the Pskov region. There are picturesque, with quaint twisting contours of the shoreline s Ale lake (up to 40 islands, 25 of peninsulas, 20 bays). Due to its unabashed beauty, all adjacent to this lake district Bezhanitsy colorful hill got the popular name Alyanschina [1; 3]. Another deserving first attention and the object of protection is in Dedovicheskom area. In scenic hilly – basin Sudomskoy terrain elevations abounding lakes (60 lakes) and kamovye hills located Mountain Court. At its foot the river flows and the lake with the same name is stretched, an ancient site is located nearby.

**Conclusion.** In general, the natural potential of the Pskov Region Protected Areas extraordinarily rich for the development of the network, but to date have not been fully claimed. To attract public attention to the problems of protecting the natural environment of the region, the educational action "International geographical dictation", conducted in Russia since 2015, can be used. The author has developed a special computer program of support for the organization of dictations on the regional markets.

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## **THE CONTENT OF THE TOTAL PROTEIN IN THE HEMOLIFE OF PULMONARY MOLLUSCS WELLING IN THE NATURAL WATER**

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At present, the level of technogenic load on the hydrosphere continues to be high, which causes an increase in adverse effects on natural water bodies and their flora and fauna. The state of freshwater ecosystems is estimated using many components of benthos, including mollusks. High density of natural populations, lifestyle characteristics (relatively low mobility, feeding mainly sedimentary detritus and periphyton) and ease of



harvesting allow the use of gastropods in the practice of both passive and active biomonitoring.

There is a direct relationship between the activity of the animal and the concentration of oxygen carriers in the internal environment. These differences make it possible to effectively use the widespread types of pulmonary freshwater mollusks as test organisms for assessing the biodiversity of the aquatic fauna of Belarus and bioecological studies by studying the chemical components of the habitat, as well as the structural and physiological characteristics of mollusks as a component of the bioindication of water bodies. An actual study is the exchange of proteins under the influence of various environmental factors. The data will allow solving current and future environmental problems of the state of natural waters through the study of metabolism and its regulation in pulmonary mollusks with different types of oxygen transport [1].

The aim of the study – to determine the concentration of total protein in the hemolymph of pulmonary freshwater mollusks, depending on habitat, season and type of oxygen transport.

**Material and methods.** The object of the study are pulmonary freshwater mollusks with different types of oxygen transport: copper-containing hemocyanin in pond food and iron-containing hemoglobin in coils. The experiments were performed on 324 pulmonary freshwater mollusks, divided into two groups: 162 specimens of *Lymnaea stagnalis* (pond snail) and 162 specimens of *Planorbarius corneus* (horn reel). Shellfish gathered in spring (april-may), in summer (july) and in autumn (september-october) from reservoirs of six districts of Vitebsk region (table 1). The reservoirs of the selected areas were located at a distance of no more than 30-40 km from the regional center and were reachable by public transport. In each research subgroup, there were 9 mollusks each.

Table 1 – Locations of water, soil and shellfish sampling

Collection area	Place of collection	Pond
Vitebsk district	Vitebsk	river Vitba
Dubrovensky district	village Lyady	lake Vordovye
Beshenkovichi district	village Sokorovo	lake Maloe
Ushachi district	village Dubrovka	lake Dubrovskoye
Shumilinsky district	Bashni	lake Budovest
Senno district	Senno	lake Senno

Hemolymph was obtained by stimulation of the foot with a slight tingling, which stimulates the reflex of drawing the leg into the shell and the release of the hemolymph from the mantle cavity. Determination of indices in the hemolymph was carried out by standard biochemical reactions using reagent sets of NTPK “Analysis X” (total protein) [2]. The protein content



(mg / g tissue) was determined by the Lowry method. Mathematical processing of the obtained results was carried out by parametric and nonparametric statistics using the package of statistical programs Microsoft Excel 2003, STATISTICA 6.0.

**Results and their discussion.** The content of total protein in the hemolymph of pulmonary freshwater mollusks depends on the season of the year. It was found that the maximum content of this indicator is fixed in the spring period, the lowest values are in the summer period of shellfish gathering (Tables 2, 3).

Table 2 – Total protein content (mg / g) in the haemolymph of *Planorbarius corneus* ( $M \pm m$ )

Collection Area	Season of the year		
	Spring (n=9)	Summer (n=9)	Autumn (n=9)
Vitebsk district	37,04±0,52 <sup>1</sup>	24,15±0,32	33,31±0,46 <sup>1</sup>
Dubrovensky district	33,40±0,63 <sup>1</sup>	25,02±0,44	31,24±0,65 <sup>1</sup>
Beshenkovichi district	33,17±1,08 <sup>1</sup>	25,81±0,61	32,63±1,01 <sup>1</sup>
Ushach district	35,36±0,95 <sup>1</sup>	23,55±0,83	35,14±0,60 <sup>1</sup>
Shumilinsky district	39,34±0,61 <sup>1</sup>	26,67±0,66	36,35±1,62 <sup>1</sup>
Senno district	36,62±1,70 <sup>1</sup>	23,72±0,45	31,38±0,57 <sup>1</sup>

Note – <sup>1</sup>p <0.05 compared with the summer period of shellfish gathering; <sup>2</sup>p <0.05 compared to the autumn period of shellfish collection

In comparison with the summer collection period, the horny coil has an increased total protein content in the spring period by 1.5 times in the Vitebsk, Ushach, Shumilin and Senno districts. The same patterns are preserved when comparing the summer and autumn periods. Compared with the summer collection period, the common pond snake found an increased total protein content in the spring period by 1.3 times in Vitebsk, Dubrovno, Beshenkovichi, Ushachi and Senno districts.

Table 3 – Total protein content (mg / g) in the hemolymph of *Lymnaea stagnalis* ( $M \pm m$ )

Collection Area	Season of the year		
	Spring (n=9)	Summer (n=9)	Autumn (n=9)
Vitebsk district	14,03±0,22 <sup>1</sup>	11,35±0,16	15,87±0,25 <sup>1</sup>
Dubrovensky district	13,14±0,33 <sup>1</sup>	10,05±0,18	14,14±0,17 <sup>1</sup>
Beshenkovichi district	13,58±0,12 <sup>1</sup>	10,72±0,27	14,62±0,22 <sup>1</sup>
Ushach district	13,59±0,11 <sup>1</sup>	9,95±0,65	14,35±0,19 <sup>1</sup>
Shumilinsky district	14,48±0,28 <sup>1</sup>	11,80±0,30	14,93±0,24 <sup>1</sup>
Senno district	14,54±0,17 <sup>1</sup>	10,24±0,15	15,16±0,21 <sup>1</sup>

Note – <sup>1</sup>p <0.05 compared with the summer period of shellfish gathering; <sup>2</sup>p <0.05 compared to the autumn period of shellfish collection

Содержание общего белка в гемолимфе *Lymnaea stagnalis* и *Planorbarius corneus* имеет общую закономерность у двух видов: концентрация белка снижается в летний период времени и повышается весной и осенью, что связано с активацией обмена веществ в благоприятный для жизнедеятельности, менее стрессовый летний период времени.

The total protein content in the hemolymph of *Lymnaea stagnalis* and *Planorbarius corneus* has a common pattern in two species: protein concentration decreases in summer and increases in spring and autumn, which is associated with the activation of metabolism in a life-favorable, less stressful summer period of time.

**Conclusion.** The content of total protein in the hemolymph of pulmonary freshwater mollusks was reduced in summer and increased in spring and autumn. These changes are associated with a change in the composition of the food base, physical and physiological activity of organisms and the external influence of environmental factors. Based on the data obtained, an algorithm for establishing the ecological state of water can be created by analyzing simple and accessible methods for studying the total protein in three parameters: the season, habitat and type of oxygen transport using two model organisms, *Lymnaea stagnalis* and *Planorbarius corneus*.

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# DETERMINATION OF THE SOCIAL ROLE OF LANGUAGE, LANGUAGES, LITERATURE, BELARUSIAN FOLKLORE FUNCTIONING IN THE DEVELOPMENT CONTEXT OF EUROPEAN AND WORLD CULTURES

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## CONTEMPORARY ENGLISH LANGUAGE

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Living in the world where the English language dominates in many spheres means that one should constantly update the knowledge and be aware of all changes occurring in the language. Speaking a foreign language freely requires everyday practicing and consulting official dictionaries to keep up with the times and take into account new language modifications.

The relevance of the topic is associated with inevitable changes in English due to social and technology changes, political and economic developments, sport, fashion, popular music, medicine, psychology, ecology and even different types of crime. It all gave rise to new words that have taken on a new significance. The results of the research may help people be familiar with contemporary English vocabulary.

The aim of the study is to analyze recent changes in the English language.

**Material and the methods.** To provide you with the updated information we've examined Longman Dictionary of Contemporary English, Cambridge American English Dictionary, numerous of articles on changes in English. Also, I had a chance to ask native speakers about their observation and use of neologisms. The material of the research is formed and classified based on the continuous selection methodology.

**Results and their discussion.** Language variation and change derive from the fact that its vocabulary is directly related to both production aspect and social activities of people.

Here are some examples of new-formed words and their meanings:

*Trendsetter* – someone who starts a new fashion or style.

*Corridors of power* – the higher levels of government where the most important decisions are made.

*Bling* – expensive, ostentatious clothing and jewelry.

*Frankenfood* – genetically modified food.

*La-la Land* – a fanciful state or dream world. Also, Los Angeles.

*Whovian* – a fan of the British science-fiction television series Doctor Who.

New words can also be formed by combining other two words.

*Cyberspace* – a word, used to mean the place where electronic messages, information, pictures etc. exist when they are sent from one computer to another.

*Multimedia* – using a mixture of sound, pictures, film, and writing to give information, especially with computers.

*Edutainment* – films, television programmed, or computer software that educate and entertain at the same time.

Such words as *downsize* and *outplacement* have gained a new meaning in business sphere.

Example: *Outplacement* – the process of a company helping people to find new jobs after asking them to leave their employment.

*Downsize* – if a company or organization downsizes its operations, it reduces the number of people it employs in order to reduce costs.

Such combinations are the part of official vocabulary, which can be found in official announcements and publications. For example:

«With a merger, *downsizing* or other organizational change that requires a layoff of employees, the impact on the corporation can be great, especially in terms of public perception, customer reaction, Wall Street response, as well as residual employee morale and productivity» [1, p. 46].

One of English's best assets is its flexibility. You may find absolutely new meanings of words you've learned before.

*Buddy* – 1) a friend; 2) AmE spoken: used to speak to a man you do not know; 3) someone who offers to look after and become a friend to a person who has AIDS.

*Eternity* – 1) either an infinite or an indeterminately long period of time; 2) the last two minutes of a football game.

*Feed* – 1) to give someone food, or the food that you give another person or animal; 2) a place where everyone you've ever met posts pictures of their lunches, their babies, and their engagement rings.

*Tag* – 1) something you put on a gift to show who it is going to; 2) naming names, when it comes to who's who in a photograph of an event identity forever and ever.

*Viral* – 1) a negative condition when an infectious disease can travel posted online to Facebook, so that person becomes attached to that visual

from one host to another; 2) a positive condition when a video, story, meme, or gif travels from one person on a computer to another.

Particular attention should be devoted to the speech of the youth of today. Their speech acquires more and more words with new meanings. Lexicographers call this phenomenon slang [3].

We examined English slang by reading books on the subject and asking native speakers and chose relatively new expressions used by young people:

*Conk* – a blow to the head or nose.

*Corker* – someone or something that/who is outstanding. A standout.

*Doofer* – an unnamed object.

*Fence* – a person who deals in stolen property.

*Hard Cheese* – an expression of bad luck.

*Queer someone's pitch* – to spoil someone's efforts.

*Skive* – feigning illness to get out of going to work or school.

*Skint* – without money, broke, bankrupt.

*Spawny* – lucky.

**Conclusion.** The English language is changing and acquiring many new words each day. The language changes are connected with social and technology changes, political and economic developments, sport, fashion, popular music, medicine, psychology, ecology etc. Appearing of new words makes English flexible as well as old words acquiring new meanings.

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## **THE LANGUAGE OF THE NAMES OF CATERING ESTABLISHMENTS IN QUEBEC AND THE REPUBLIC OF BELARUS**

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In fact, it has been estimated that more than half of the world's population is bilingual, that is uses two or more languages in everyday life. Bilingualism is found in all parts of the world, at all levels of society, in all age groups.

The relevance of this research is based on need to study the nature of bilingualism as in bilingual communities the fact that different people speak different languages corresponds to a division in different communicative networks. Thus, this paper may help to foresee the tendency of bilingualism by investigating Belarusian and Quebec onomastic space i.e. names of catering establishments in Belarus and Quebec in order to reduce the potential for conflicts based on linguistic separation.

Our aim is to reveal the tendency of the development of bilingualism in the names of catering establishments in Belarus and Quebec.

**Material and methods.** Our research was based on numerous search queries on the Internet related to several linguistic spaces on the territories of our concern such as Quebec and The Republic of Belarus, and the way they coexist in the names of catering establishments within the two countries. To achieve the main aim of our research we turned to the following scientific methods:

- data collection (including the data gathered from social media, censuses, advertising websites etc.);
- descriptive method;
- statistical analyses.

**Results and their discussion.** In our research we made attempts to find out the tendency of the linguistic choice in the names of catering establishments on the territories of Belarus and Quebec. To make a comparison we analyzed the vitality of the state languages in the given countries against the background of the growing influence of the English language.

In many bilingual communities the two groups of speakers don't have equal status. In our case this inequality is complemented by the emergence of English as the lingua franca of business and technology. Thus, in these names we contrasted the following linguistic spaces:

- French as a state language with English; French as a state language with languages spoken by other ethnic groups in Quebec.
- Russian and Belorussian as state languages with English: Russian and Belorussian as state languages with languages spoken by other ethnic groups in the Republic of Belarus.

According to the statistics names of catering establishments in Quebec given in French represents 93% (*“the Marché du Vieux-Port”, “Aux Anciens Canadiens”, “Casse-Crêpe Breton”* etc.). 5% are given in English (*“Zone Cafü”, “Second Cup”, “St. Patric Irish Pub”* etc.) and 3% are given in the languages spoken by other ethnic groups (*“Sapristi” – Italian; “IBERICOS” – Spanish; “Mechoui Marrakech” – Arabic* etc.)

However, it should be noted that 93% of names represents also foreign enterprises that according to the law adopted in 2015 should display a French equivalent or descriptor of their services in French (*“Cafü Starbucks”, “Les thüs David’s Tea”, “KFC” is “PFK”, “Poulet Frit Kentucky”* etc.). This especially applies to businesses with English names [2].

Taking into account the territory of Belarus the percentage is the following:

78,5% of names are given in English (*“Golden Caffee”, “Procafü”, “News Cafü”* etc.), 14,5% - in Russian (*“Сезоны”, “Амстердам”, “Рояль”* etc.), 6% in Belarusian (*“Камяніца”, “Бярозка”, “Архідэя”* etc.) and 3% of



names are in the languages spoken by other ethnic groups (*“La Scala” – Italian; “Ronin” – Japanese; “Kebab” – Turkish etc.*).

Taken together, these studies show that the language space of the territory of Belarus and Quebec forms a sort of linguistic confrontation between the state languages within these territories and the languages spoken by other ethnic groups including English as the language of our concern.

**Conclusion.** Summing up the results of our research, we may conclude that the bilingual situation in the given countries is developing in circumstances where one language dominates and another one is suppressed. In the case of the francophone province of Quebec the English language is either replaced by the dominant language or simply have to francicize its trademarks.

Taking into account names of catering establishments in Belarus we may conclude that the government doesn't take serious measures in order to uphold bilingualism policies in comparison to Quebec. There all efforts are made to defend the status of French as the primary language in Quebec which is not the case with the Russian and Belarusian languages.

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## THE MAJOR PRINCIPLES OF WORD FORMATION IN AMERICAN STUDENT SLANG

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One of the most “problematic” and insufficiently investigated lexical layers is slang. According to the definition given in Cambridge dictionary, slang is very informal language that is usually spoken rather than written, used especially by particular groups of people [8]. In comparison with other English speaking countries, slang is more widespread in the USA. E. Partridge points out that, unlike Englishmen, Americans are more conducive to slang: it is more common for American educated citizens' speech than British ones' [2]. One of the ways of American English vocabulary enlargement is student slang that exists in the language since the very moment of universities and other educational institutions appearance.

It should be noted that modern American college slang differs from traditional one. It is extremely mobile, however its leading function remains the same – it is emotionally expressive [3].

The aim of the research is to describe American student slang in terms of its system of word formation.

**Material and methods.** Building on “NTC’S dictionary of American slang and colloquial expressions” by R. Spears, “American College Slang: for International Students” by A. Gillett, the materials of SlangSite Online dictionary, we have studied the most common expressions of American college slang. We have identified the major ways of their word formation and compared them with the word formation models of American slang words as a whole. In the article the comparative method, the descriptive method, the continuous sampling method and the method of the analysis and synthesis of information have been carried out.

**Results and their discussion.** To begin with, American student slang is a theoretical term, for almost every USA college has its own distinctive lexicon. However, even within the same university there is a variety of youth subcultures and this fact is also reflected in the language. There are “*joks*” (young people, interested in sports), “*motor heads*” (car enthusiasts), “*intellectuals*”, “*freaks*”, “*populars*” (socially active), “*normals*” (the bulk), the “*nobodies*” (uncommunicative), etc. Observational series show, that college slang reflects issues, being important for students (personality appraisal, descriptions of food, parties, relationships, intoxication, etc.) [3].

We have carried out the comparative analysis of the major word formation principles of American slang words as a whole with American college slang in particular, taking into account K. Tambovtseva’s conception [5]. The researcher identifies the following ways of word formation in the American youth slang vocabulary:

1. Phonological way of word formation (onomatopoeia). Onomatopoeic words can’t express any emotions, but they are very specific imitations of the natural sounds of objects, creatures and situations. The analysis shows such examples of onomatopoeic slang words in the American student slang as: *blah-blah* – a chatter; *buzz* – a call on the telephone; *boo-bird* – a person who boos frequently at games or other public events; *bow-wow* – a dog; *hush-hush* – secret, etc.

2. Semantic way of word formation that changes the semantics of existing words (a stretch of language, the restriction of the word meaning, metonymy and metaphor). Accordingly, *to hit the books* means to start studying hard before exams; *underwater basket weaving* – a college course that is totally useless or very easy; *Barbie doll* – a pretty girl; *black and white* – the police (a black and white police patrol car); *to have a tiger by the tail* – to become associated with something powerful and potentially dangerous, etc.

3. Morphological way is one of the most common ways of American college slang word formation. It includes the following types:

a) composition which is performed by joining two or more bases into a compound word: e.g. *bromance* (brother and romance); *froyo* – frozen yogurt; *whatdycallem* – what do you call them; *fantabulous* – great;

b) metathesis (the rearranging of sounds or syllables). It's observed in such variations as: «back slang» (*reeb* – beer, *nam* – man, *nird* – drink), «centre slang» (*geke* – geek, *Ilkem* – milk), «rhyming slang» (*tin plate* – mate, *cat-soup* – ketchup), etc. However, such expressions are not widely represented in American college slang, unlike the ones, preserving the rhyme within a word: *hoity-toity* – pretentiously self-important; *classy-chassy*; *fancy-schmancy*;

c) affixation, i.e. the formation of new words by attaching a certain affix to the stem: the attaching of prefixes, that is though untypical of American student slang (e.g. *to pregame* – to get together to drink before going to a sports game; *overdose*), suffixes (*airish* – chilly), affixoids (-aholic, -omatic, -orama, etc.): *shopaholic*, *workaholic*, *foodaholic*, *jogomatik*, *geekorama*, etc. It should be noted that suffixation is a common way of American student slang word formation. Furthermore, the suffixes of literary American English are generally used, but their set is more limited here. The most common ones are: -ed (*blissed* – in a state of emotional bliss; *campused* – restricted to the campus), -ie (*sweetie*; *alkie* – alcohol; *aggie college* – agricultural college; *baddie*; *bunkie* – roommate), -er (*all-nighter* – an event that lasts all night; *baby-kisser* – politician; *blinkers* – eyes; *a slacker* – one who does not work hard), etc. According to E. Rubanova's opinion, some suffixes of foreign growth are used, one of the most widespread of them is the suffix -o (e.g. *weirdo* – a loser; *crisco*, *chubbo* – a fat person). There are also suffixes that do not change the meaning of the word they are attached to (“splinters”) [3]: e.g. *buckage* – money, *bookage*, *workage*, *rainage*, *understandage*, etc;

d) abbreviations that are used to save time and space in spoken and written language. They are formed from the first letters of the words of a phrase. The examples are the following: *BNOG* (“big name on campus”) – a student that is the chair of a society or involved in student politics; *AFAIK* – as far as I know; *NARP* (“non-athletic regular person”) – someone who is not involved in any sport, specifically inside campus life; *GPA killer* – a very difficult course that is likely to give a student a poor grade and thereby lower their GPA); *Ames* – “an American Studies class”; *PoliSci* – political science; *biochem* – a Biological Chemistry class –, etc. Two more types of abbreviation, typical of American college slang are apocope – the truncation of the final part of a lexical unit (*bro* – brother, *app* – application, *fam* – family, *to dis* – to treat someone with disrespect, *champ* – a champion, etc.) and aphaeresis – the truncation of the initial part of a lexeme (*'bout*, *'cause*,

*burb* – a suburb, *za* – pizza, etc.). It should be noted that American students are used to writing SMS on the Internet, often replacing full words or their parts with digits: *4 ever* – forever, *2* – to, etc. Besides, so-called “blends” may be easily found in American college slang [6]: *huney* – huge and puny; *fugly* – fat and ugly, etc.

**Conclusion.** It has been revealed, that one of the most common ways of word formation in American student slang is a morphological one, in particular, composition, suffixation (such suffixes as: *-er*, *-ed*, *-ie*, *-age*, etc.) and abbreviations (including apocope and blends). Our study has shown that student slang is a productive lexical layer of American English and it certainly requires further investigation.

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## ONLINE TRANSLATORS AS AN EFFECTIVE MEANS OF WORKING WITH ENGLISH TEXTS

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The English language has become an essential part of our life. More and more people are learning English. This process means translating from one language into another one. For this purpose we usually use a bilingual dictionary. But modern generation has a growing tendency to use online translators. They are convenient as if you have access to the Internet translation takes little time. Moreover, online-translators give a chance to translate not only separate words but the whole passages from books,

magazines, etc. The question is if they are so good why online translators cannot substitute interpreters and translators.

The aim of our article is to look into the essence of online-translators and understand the main drawbacks of them.

**Material and methods.** While working at the article we used the following methods: analysis of various sources of information: books, publications in magazines; the compilation of the information; a survey among first-year students of our college.

**Results and their discussion.** Nowadays the Internet provides a variety of online-translators. It is no use examining all of them. Therefore, we decided to narrow the area of our research and conducted a survey among first-year students in order to learn the most popular online translators and understand how good they are.

According to the survey 57% use Google Translate, 31% - Yandex Translate and 12% – PROMT Translate. Our students turn to online translators to do their homework, to chat online, to translate unknown words. The research shows that these translators are popular as they are convenient and quick in use. We can translate not only separate words but also extracts from texts if you do not have a good knowledge of the language. The second part of our survey proves that online translators aren't so effective as they seem to be. 76% of the surveyed are not satisfied with the level of translation accuracy when they translate the whole passages and extracts. They note that in some cases the translated variant is awkward and ambiguous and sometimes meaningless.

To prove that fact we decided to translate an extract from the book “The Great Gatsby” by Francis Scott Fitzgerald online.

The original variant	Google Translate
He didn't say any more, but we've always been unusually communicative in a reserved way, and I understood that he meant a great deal more than that. In consequence, I'm inclined to reserve all judgments, a habit that has opened up many curious natures to me and also made me the victim of not a few veteran bores.	Он больше ничего не говорил, но мы всегда были необычайно коммуникабельны, и я понял, что он имел в виду гораздо больше. В результате я склонен зарезервировать все суждения, привычку, которая открыла мне много любопытных натуры, а также сделала меня жертвой не нескольких ветеранских буре [4]

We see that Google Translate variant is too literal, it gives a mechanical and direct translation of words, it doesn't analyze entire phrases for context and choose the proper meaning before offering up a translation the way a human interpreter does. The translator doesn't always differentiate tense-forms, if you translate from Russian into English the word order is incorrect.



## DETERMINATION OF THE SOCIAL ROLE OF LANGUAGE, LANGUAGES

The original variant	Yandex Translate
He didn't say any more, but we've always been unusually communicative in a reserved way, and I understood that he meant a great deal more than that. In consequence, I'm inclined to reserve all judgments, a habit that has opened up many curious natures to me and also made me the victim of not a few veteran bores.	Он больше ничего не говорил, но мы всегда понимали друг друга без лишних слов, и я понял, что он имел ввиду гораздо больше, чем это. В результате я склоняюсь в сдержанности суждений, привычка, которая открыла много любопытных натур ко мне и чаще делала меня жертвой на несколько ветеран отверстий [5]

In comparison with Google Yandex Translate is more proficient. It differentiates grammatical structures, finds suitable alternatives for Russian equivalents. In general, the translation is adequate. But the last sentence shows that this translator isn't reliable in more complicated sentences.

The original variant	PROMT
He didn't say any more, but we've always been unusually communicative in a reserved way, and I understood that he meant a great deal more than that. In consequence, I'm inclined to reserve all judgments, a habit that has opened up many curious natures to me and also made me the victim of not a few veteran bores.	Он больше не говорил, но мы всегда были необычно общительны зарезервированным способом, и я понял, что он имел ввиду гораздо больше, чем это. В последствии я склонен отложить все решения, привычка, которая открыла много любопытной природы мне и также сделала меня жертвой многих, ветеран наводит скуку [6]

The PROMT Translate proves to be the least popular as it doesn't give a comprehensive translation of the text. The level of accuracy is low. It doesn't differentiate grammatical structures and lexical meaning of words. The translation is incomprehensible.

Kevin Devlin, executive director of Stanford University's Center for the Study of Language and Information, notes that "fluent translation, as a human expert can do, is in my view, not achievable" [3, p.93]. Translation is much more than just word-for-word changes, it has to include idioms, cultural context and intention of the writing to get to the true meaning of some text.

Therefore, machine translation is recommended for quick translations, on websites and in general texts when you need something incomprehensible translated. They can be used by beginners and pre-intermediate learners who chat online or communicate with a pen friend. To ensure that your message gets through as you intend it we recommend making up clear and concise sentences, using correct punctuation, checking spelling, and avoiding using slang or colloquialisms that may not be translated well.

For upper-intermediate and advanced learners we advise to use English-English dictionaries (for instance, Cambridge Dictionary, Oxford Dictionary,



Longman Dictionary). They define the word, give examples and the sphere of usage.

**Conclusion.** Online translators can be useful for tourists who want to eliminate some gaps of language misunderstanding both in spoken and written communication. They are still far from what would be ideal as not everything is translated with the service, thus, a comprehensive translation of the text is not provided. Machine translation is mechanical and not natural-sounding. Words are intricately interwoven with cultural and personal meanings, ideas, feelings, tone, a target audience. Today's computers are not able to delve into these depths.

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## **ARTIONYMY AS A BRANCH OF ONOMASTICS: THE HISTORY OF THE STUDY**

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Oftentimes works of art reflect the current state of society. It is necessary to examine the names of the works of art in close connection with them, because their names can convey social-cultural information and may act as a translator of historical, political and other kinds of information.

In modern onomastic science special attention is paid to the analysis of onomastic periphery, artionymy in particular. In view of this, to our mind this study seems to be relevant.

The aim of the article is to examine and to systematize linguistic studies, which are devoted to the analysis of the names of paintings in various aspects.

**Material and methods.** The sources for the study are the scientific works of scientists who deal with the linguistic analysis of artionymy.

The aim of our research has led to the choice of methods. Therefore, we used the descriptive method, which includes studying, generalization and interpretation of the theoretical material.

**Results and their discussion.** There are a number of approaches to determination of artionymy as a sector of onomastic space. Some scientists examine the names of works of art as objects of material culture. Then they should belong to *khrematonymy* or *pragmatonymy*.

In the “Dictionary of Russian onomastic terminology” (1988) *N.V. Podolskaya* introduced the term *artionym* for scientific use. Under this term she understands the proper name of work of fine art (painting, graphics and plastics) [7, p. 38]. The author differentiates the names of objects of intellectual culture (*ideonymy*) and the names of objects of material culture (*pragmatonymy*) [7, p. 61; 110]. In such a manner *artionym* is a kind of *ideonym*.

Despite the appearance of the term, special interest in the study of artionymy in onomastic science was not observed. At the same time, in the late 90s XX century the interest in the analysis of onomastic periphery is growing. Thus, various categories of the proper names of objects of spiritual creativity are explored: the names of literary works (*biblionymy*), the names of movies (*filmonymy*), etc.: *A.V. Antropova*, *N.A. Veselova*, *E.V. Knysch*, *O.A. Ostapchuk*, *Yu.N. Podymova*, *I.V. Kryukova*, *N.A. Srebryanskaya*, *V.I. Suprun*, *A.V. Surtaeva*, *S.G. Tikunova* and others.

The linguistic study of artionymy began in the late 20th – early 21st centuries. The first extensive research of artionymy in Russian linguistics is presented in the study of *E.A. Burmistrova* “The name of works of art as an object of onomastics” (2006). The main task the author faced was to determine the place of artionyms in the onomastic space of the Russian language. In addition, the structural-semantic types and specific features of the artionyms’ functioning were identified [1, p. 4].

Some scientific articles devoted to the study of artionymy in different aspects were published in 2010–2017.

In the scientific article of *T.I. Pluzhnikova* the painting is examined as a special kind of creolized text, in which the artionym can perform the function of ecphrasis and the picture has an iconic function [6].

The article of *D.V. Maydanyk*, *L.A. Petrova*, *L.P. Rusopova* and others are devoted to the analysis of ideonymy in the linguocultural space of the narrative in I. Ilf and E. Petrov’s novel “The Golden Calf”. Besides, the artionyms are examined as elements of language game.

Not all scientists understand under the term *artionym* only the proper name of work of fine art. Thus, *D.D. Droshnev*’s scientific article is devoted to the analysis of the features of the representation of the names of musical compositions in the texts (including epistolary texts) of V.F. Odoevsky [2].

In the dissertation “Names of paintings of American artists of the XX – XIX centuries: the experience of discursive description” (2013) *T.V. Efremova* analyzes the names of works of American painting as small-format texts. The author reveals the dynamics of the paradigm of these texts

and describes their structural-semantic, pragmalinguistic, linguocognitive and linguocultural characteristics [3].

The year 2017 has particular importance for the study of artionymy. There is an active growth of interest in this category of onomastic periphery in various branches of scientific knowledge. Two dissertations devoted to artionymy were prepared and defended. *N.M. Mukhametgareeva's* dissertation is devoted to a comparative analysis of the names of paintings by impressionists (partially post-impressionists) in the French and Russian languages. The author determines the specific characteristics of the Russian and French artionym, reveals the patterns of translation of artionyms on different language levels in different thematic groups [5].

A comparative analysis of German and Russian artionyms is carried out, the main models are identified, the types of translation transformations during the interpreting and transfer of German and Russian artionyms to another language are determined in the thesis research of *L.A. Klimova* [4].

Artionym can translate the history of nation and act therefore as a source of historical information (*V.N. Filas*).

In Belarusian linguistic this branch of onomastics is practically no examined. There are only several works about the names of objects of intellectual cultures. For example, *S.E. Gnitsevich* analyzes artionyms presented in school textbooks on the Russian language, but there are primarily biblionyms.

**Conclusion.** Thus, artionymy remains a not enough explored sector of proper names pertaining to the onomastic periphery. The main recorded researches belong to Russian linguists who conducted the analysis by comparing the artionymy in different language systems. At the same time, in Belarus there are practically no works devoted to the study of artionymy.

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### RACIALISED URBANITY IN AMERICAN LITERATURE

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The notion of urbanity as the expression of a peculiarly modern form of urban consciousness – the projection of an urban mode of being and self-awareness of what it means to be a citizen in a rapidly changing urban polis – has been the subject of much critical analysis.

**Material and methods.** When writing this article, the following research methods were used: literature review on the subject and its critical analysis (works of Robert E. Park, Richard Lehan, Amiri Baraka, A. Robert Lee and et al.).

**Results and their discussion.** The meanings of urbanity are manifold. It refers to the evolution of civic consciousness and responsibility and stresses the importance of the life of the mind, in terms of everyday customs, artistic endeavour, human communication and philosophy, in the construction of what it means to live in the city [1, p. 14]. It is also crucially dependent on the idea of the coming together of strangers who construct the city through social interaction that is not based on kinship or group membership.

In modern and post-modern literature, the city is an almost universal setting. However, it could hardly be argued that every modern or post-modern text with a city setting qualifies as urban literature by virtue of that setting. In critical discourse on urban literature, scholars tend to focus on one of two literary elements as central to the identification of a text as urban literature. On one hand, scholars such as Richard Lehan, Mary-Ann Caws, and David Seed tend to view the city setting as central to the identification of a text as urban literature. On the other hand, scholars such as Diane Levy and Michael Jaye and Ann Watts tend to view character as central to the identification of a text as urban literature. Both views and approaches are valid in their fundamental basis: obviously, a text cannot be considered urban without the presence of the city, yet at the same time, “urban” is an adjective denoting someone or something as “being” of the city.

What urban literary works have in common is that they reflect the discursive heteroglossia that resonates in the texture of each city, at the core

of which lies an ultimate otherness on the personal, social, cultural and political levels that permeates and determines the modern city dweller's everyday experience [1, p. 28].

There is an experiential difference between the European city and the American city: "In Europe, the city had to define itself against its medieval origins and the transformation from feudalism; in America, against the wilderness and the frontier experience". [2, p. 18].

Since the eighteenth century, the city and the African-American have had a unique relationship, particularly with the northern city. The "marginal" position of black authors has disappeared on the book market in the United States, but the themes of alienation and anger will not vanish as readily from their works. Instead of integration into the literary and artistic mainstream, black writers and artists wanted, especially since the Black Arts Movement of the 1960s, to arrive at their "own" forms of literary expression which would have direct relevance for their lives. They wished to answer the question of their relationship to white mainstream culture by implementing a multicultural strategy: their literature is not that of assimilation, but in many ways that of establishing difference, separatism, and cultural resistance [3, p. 10].

While one of the central drives in classic literature has been a nearly reflexive desire to move away from the complexity and supposed corruption of cities toward idealized non-urban settings such as Cooper's West, Thoreau's woods, Melville's seas, Whitman's open road, and Twain's river, very often the opposite has been true in African-American letters [3, p. 11]. To be sure, many important black texts such as Washington's "Up from Slavery" express a deep suspicion of city life, but the main tradition of black American literature has been persistently pro-urban in vision. "The Narrative of the Life of Frederick Douglass", for example, portrays the rural South as a plantation culture intent on exploiting and then destroying black people, but it envisions the city as a place of deliverance.

Much important African-American literature which has emerged since the Depression has also been largely urban in character. Although never hesitant to criticize the negative aspects of American city life, it has only rarely suggested that pastoral alternatives to the city exist for black people. This large and significant body of literature, moreover, contains some surprising celebrations of city life. For example, James Baldwin's best fiction is rooted in New York, a place of extraordinary beauty as well as pain.

Amiri Baraka's essay "Black Literature and the Afro-American Nation: The Urban Voice" argues that, from the Harlem Renaissance onward, black literature has been "urban shaped," producing a uniquely "black urban consciousness." While careful not to gloss over the problems of black people in American cities, he predicts that the setting for black liberation will be the city [4, p. 139].



One way to explain this surprisingly positive image of the city in African-American literature is to examine the historical experience of black people in America. From the very outset, black people were denied imaginative access to a pre-urban homeland in Africa because the institution of slavery did everything possible to stamp out the memory of that world. And the actual experience of slaves in America did not permit them the luxury of romantically imagining the non-urban settings which are so mythically prominent in the fictions of Cooper, Melville, and Twain.

The city, therefore, has been a crucial symbol in black literature and that literature has been remarkable for the rich variety of ways it has used urban settings and themes. Because of this, the city in African-American literature resists any simple categorizations and neat generalizations. A. Robert Lee, in discussing literary portraits of Harlem, stresses this important point: "The only fact about Harlem ... may be its intractability, its undiminished refusal to be accommodated by any single explanation. That, one supposes and readily celebrates, accounts for why there have been so many Harlems on the mind-be they expressed in the novel or in any of the abundant other forms inspired by the enduring black First City of America" [5, p. 83].

**Conclusion.** The city has been-and continues to be-a live subject for black American writers, inspiring a rich diversity of literary visions of the city as it is captured by black writers from different times, places, backgrounds, and angles of perception. For example, the predominantly hopeful images of the city contained in slave narratives contrast sharply with later naturalistic accounts of urban reality expressed in novels. And even when black writers living in similar time periods focus on the same city, they often develop radically different literary visions of that city.

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## THE ROLE OF DETAILS IN EDGAR ALLAN POE STORY “THE FALL OF THE HOUSE OF USHER”

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Nowadays the role of a detail in literature, in writer's works is huge. For the definite details, authors make a real picture, atmosphere of by describing a place or person. A landscape (mostly), a portrait, an objects and an interior act as a detail.

The aim of our research is to find details and to study the role of symbols and details in Edgar Allan Poe story “The fall of the house of Usher”.

**Material and methods.** The material of our study is the “dreadful” story by Edgar Allan Poe (1809–1849) “The fall of the house of Usher” (1839). During the research we have come to the conclusion that the story by E.A. Poe is filled with a great number of details, the use of which is aimed at the making a special atmosphere and a whole picture of the story. We have used comparative and psychological methods.

**Results and their discussion.** A detail is the main author's helper for the creating a whole picture. If you pay attention on details, you can understand what has been happening in a character's soul, emotional coloration of the work, the reasons of thoughts and doings and you can even learn which the finale will be and how the work will end. In Edgar Allan Poe story “The fall of the house of Usher” details are key instruments for creating physiological state of both narrator and Roderick Usher. Just details help to create psychological types and reveal the reasons of Usher's behavior. As Russian classic F.M. Dostoevsky said: “There's one exactly feature at Edgar Poe, which distinguish him from all other writers and it make his abrupt feature: it's a power of imagination... There is such feature in his capability of imagination, which we won't see at anybody: it's the power of details... In Poe's stories you see all the details of presented figure or event so bright as if you convince of his opportunity” [1, p. 34].

Thus, we can pick out several groups of details in the story: details, reflecting inner world of the characters and details, reflecting characters' and objects' appearance, creating the atmosphere of the story and subject details and abstract details.

Dominant details of the work which create a special atmosphere are the house (inner and outside state), the nature, the weather and the portrait. As Edmund Burke considered, “the sources of beauty for poet are three spheres of being: a nature, an art and the world of people relationship which is taken in relatively narrow aspect.” [2, p. 92].

The dominant details branch out the other details: the tarn, the fissure, the song, the epigraph and the picture. Just for these microdetails we may see the whole work.

The weather belongs to abstract details and it reflects an inner world. It creates a special atmosphere for a reader in order to help to try the feelings which the narrator feels (the beginning of the story). At the beginning of the work the weather is calm but depressing, gloomy and frightening. The description of the trees, the tarn and the sky scare the character and it ushers in the condition close to the feeling of horror: "... and, acting upon this idea, I reined my horse to the precipitous brink of a black and lurid tarn that lay in unruffled luster by the dwelling, and gazed down – but with a shudder even more thrilling than before – upon the remodeled and inverted images of the gray sedge, and the ghastly tree-stems, and the vacant and eye-like windows" [3, p. 126]. As a consequence a word "superstition" arises in his consciousness but in a bad sense (meaning) of the word, boding something bad, spiteful, and dangerous. During the work the weather and the nature symbolize a horror reigning in Usher's soul. Usually the weather is reflection of the protagonist's feelings and mood, but here the weather fully reflects Roderick Usher with all his fears and depressing thoughts. At the end of the story the storm is beginning and it's so dark in the street that even the moon can't be seen. It's a peal in Usher's soul and the weather exactly impacts that has been happening with him at that moment. Here we can compare the weather in the beginning and in the end of the story and we can confront it with Roderick Usher's inner state: in the beginning of the work "the weather" is gloomy and depressing but calm, that is symbolize "stable" fear in Usher's soul; in the end of the work a heavy storm is beginning and is becoming so dark, that even the moon can't be seen – a "peak" of Usher's fear as a result of which he dies. After Roderick's death, who died because of his fear, a light of blood-red moon (the symbol of death) dispels darkness. Thus, the weather became a peculiar symbol of Roderick Usher's inner world. A key moment in the nature is a tarn, which is located under the brink, near the house. Usually a tarn is a symbol of calmness. Here the tarn is black and lurid, so it's a reflection of a fear and anxiety.

The next universal detail which can be referred to all groups is the house. We'd like to stress that the house not only creates this threatening and repulsive atmosphere but also as the weather reflects Usher's inner state. The house is full of oppositions as moss and mustiness are symbols of neglect and abandonment. But in this work as if Roderick himself stresses by these plants that the house is "alive" and firm. So on the one hand the plants make it neglected but on the other hand plants make it "alive"; the distribution of the stones which make the picture of "survivor house" and in opposition to it a dilapidation and barely perceptible fissure which goes through the whole house and not visible for the "simple" eyes. The manor is a symbol of

Roderick Usher himself but the fissure in the house is Usher's fear which has been gradually killing him. In this case like with the nature in the beginning of the story the fissure is barely perceptible but it exists and it destroys the house; in the end of the story the fissure destroys the house (because of the storm which was the incitement for it) as the fear kills Roderick Usher.

Usher believed greatly in his family curse, he believed that there is an evil spirit in the house for whom his sister has become ill and who will come soon for him. And an evil spirit really existed but not like in Usher's imagination. The detail which symbolizes very subtly and characterizes Roderick Usher is a song-ballad which he is singing to the narrator: a king is identifying with Usher. A hero was attacked by evil spirits both in the song and in our story. But evil spirits in the song is a literal sense but in Usher's house evil spirits are a fear in Roderick's head. Also the ending of the song is very symbolic: "A hideous throng rushes out forever, / And laugh – but smile no more" [3, p. 133]. A laugh without smile means sarcasm, wicked irony. Here, to our point, the author laughs softly at Usher and he even derides his silly baseless fear. And as the narrator mentions: "... an influence which some peculiarities in the mere form and substance of his family mansion had, by dint of long sufferance, he said obtained over his spirit – an effect which the physique of the gray walls and turrets, and of the dim tarn into which they all looked down, had, at length, brought about upon the morale of his existence" [3, p. 130].

One more important detail is a picture which Roderick Usher painted and which symbolizes his "soul disease": "A small picture presented the interior of an immensely long and rectangular vault or tunnel, with low walks, smooth, white, and without interruption or device" [3, p.131]. If we look deeper on it, we can suppose that white walks (or just walls) are usual phenomenon for hospitals and mental hospitals and an immensely long tunnel without interruptions or device is a place without exit. Here we can make a conclusion that Usher had got off the wit hopelessly and he can't find an exit from his own thoughts and fears, he can't get off his own head.

**Conclusion.** Thus, we had concluded that the role of a detail in fiction is huge. A detail helps to expose images and characters' inner state; it exposes concealed psychology and strengthens psychological perception of the story.

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PECULIARITIES OF THE NORTHERN DIALECT  
OF THE FRENCH LANGUAGE ON THE MATERIAL  
OF THE FILM «BIENVENUE CHEZ LES CH'TIS»

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The French language comes from folk Latin, however, it is further away from Latin. There are different dialects on the territory of France. It is accepted to distinguish the following: central, northern, western, eastern, south-western, southeastern, zone of the Paris basin [1]. Each of these dialects is characterized by its own speech system, as well as unique morphology and grammar. Actually, the standard French language developed mainly on the basis of the Ile-de-France dialect.

The aim of the study is to establish phonetic, lexical, grammatical features of the northern dialect of the French language of the Pas-de-Calais region.

**Material and methods.** The material of the research is linguistic units, which were picked out from the film «Bienvenue chez les Ch'tis». In our opinion, it perfectly demonstrates the language differences between the inhabitants of the southern part of France and the north, as well as the peculiarities of their culture and everyday life. During the work on the article we used the following methods: the method of data collection, classification and description.

**Results and their discussion.** Let's examine in detail the phonetic, grammatical and lexical differences of the Picardian colloquial language from modern French.

From the point of view of *phonetics*, we have revealed the following features:

1. The most used and known example is the replacement of sound [s] with sound [ʃ]: *ch'est* instead of *c'est*, *cha va – ca va*, *ichi – ici*, *chavez – savez*, *cha – sa*, *challe – salle*, *cha chent – ca sent*, *auchi – aussi*, *qu'echque – quesque*, *merchi – merci*.

2. The following feature can be considered the use of sound [i] instead of [wa]: *mi – moi*, *ti – toi*, *pourqi – pourquoi*.

3. Falling out of vowels: *j'parle – je parle*, *rin – rien*, *d'vrais – devrais*, *l'poste – la poste*, *d'main – demain*, *m'baraque – ma baraque*, *l'lavande – la lavande*, *t'chambre – ta chambre*, *j'te – je te*, *j'vous – je vous*, *ptit – petit*, *vir – voir*.

The *grammatical features* observed are the following:

1. The use of passé composé without an auxiliary verb: *j'te dit* instead of *je t'ai dit*, *j'vous reconnu – je vous ai reconnu*, *tu pas congelé – tu n'as pas congelé*.

2. The frequent absence of one part of the negation: *ch'est pas grave* instead of *ce n'est pas grave*, *j'ai jamais – je n'ai jamais*, *t'as pas à preter – tu n'as pas à preter*, *j'aime pas – je n'aime pas*.

3. The use of a phrase *il y a* without pronoun *il*: *y a pas de changer* instead of *il n'y a pas de changer*, *y a la challe de bain – il y a salle de bain*, *y n'a pas – il n'y a pas*, *y a que de café – il y a de café*.

As for **lexical features**, the individual words can be replaced by local variants: *baraque* instead of *appartement*, *meubes – meubles*, instead of the traditional pronoun *quelque chose*, used in the standard French version, we use *quequ'kose*, *gambe – jambe*, *gardin – jardin*, *tchiot – tout*.

**Conclusion.** Thus, the results of the study indicate the presence of phonetic, lexical and grammatical features of the northern dialect of the French language. The principal distinctive characteristic of the investigated zone of France is the discrepancy in the phonetic component. Inhabitants of the north are characterized by a very special dialect, which in the scientific literature is referred to as the Picardian dialect. The vulgar naming of it sounds like a nickname: *chti* or *chti-mi*. *Chti* is called both the northern dialect, and the inhabitants themselves. They say that in Picardy, *chti* means «this» or «that», in French – *celui*. This is the characteristic feature of the dialect *chti*: the inhabitants of the north pronounce the usual French [s] as [ʃ] and [ʒ] as [k].

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## SYNTACTIC COMPRESSION AS A KIND OF VERBAL ECONOMY

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In the present paper we'll focus on the study of syntactic compression and different ways of its realization in various English works of art.

In modern linguistics there is a tendency of spreading such a linguistic phenomenon as compression. The process of language compression was under a broad scope of such outstanding scientists and linguists as Sh. Bali, R.A. Budagov, A. Martine, B. Kurtene, L.N. Murzin etc. Compression as a specific linguistic phenomenon occurs when there is a possibility to reduce some part of a text without significant damage to its contents. The modern deformations of the language, the question of optimal information transmission method come to the fore. Conciseness and accuracy of the message are primary objectives of effective communication [1, p. 180]. It should be noted that the problem of precise transmission of information is meaningful not only in linguistics but also in other fields of science.



The relevance of our work is determined by the linguistic phenomenon of compression, which covers almost all linguistic levels of the modern English.

The aim of our work is to analyze the phenomenon of compression and syntactic compression as its variety, to identify special means of expressing syntactic compression in various works of art.

**Material and methods.** Our research is based on the analysis of 30 artistic works of English and American writers (M. Spark “A Member of the Family”; K. Mansfield “The Garden-Party”; Ch. Dickens “The Posthumous Papers of the Pickwick Club” and others). Having applied the method of continuous sampling the most productive means of syntactic compression have been identified. For gaining the mentioned aim we used the following research methods: critical study of scientific literature (the works by I.R. Galperin, B.A. Ilyish, A.A. Leontiev, I.V. Arnold and etc.), observation method, descriptive method, method of continuous sampling.

**Results and their discussion.** Despite its common usage in linguistic theory, the concept of compression still has not received a definite interpretation. Some linguists view it as a source of formation of implicit meanings and presupposition (S.S. Komarova), others define it in terms of concrete means of its realization (S.I. Litvin). B.P. Dundik speaks about linguistic compression as a way of economy realization in a language [2, p. 118]. G.V. Pan notes that compression can be considered as a result of the implementation of the principle of economy. Though, the missing elements can be easily restored from the surrounding context [4, p. 12].

In our research we share the idea, that language compression is simplification, economy of speech, the omission of unnecessary items.

It has been established, that compression affects all levels of linguistic structure. In this regard A.A. Leontev wrote that the intention to save a language in certain communicative situations and the presence of high redundancy in any natural language can be considered as a cause and a basis for the expression of a particular type of compression [3, p. 141].

This leads us to the notion of *syntactic compression*. Our work views syntactic compression as syntactic and structural transformation of language units. It is characterized by the omission of the least significant details, phrases and parts of sentences.

The recent study has shown that the content of the compressed elements in the analysed texts of fiction is quite high, which is explained by the necessity of the principle of economy in a language. In the research we have determined that the most productive forms of syntactic compression used in English works of art are *parcelation*, *detachment*, *mononuclear and incomplete sentences (ellipsis)*, *aposiopesis* and *zeugma*.

*Parcelation* is a deliberate split of one single sentence into two or more parts, separated by a full stop or its equivalent [6]. For example, in the story



by M. Spark “A Member of the Family” the words of the protagonist give him a certain reticence, a reluctance to speak on the topic further: ***Gwen’s all right, darling. A great friend of my mother. Quite a member of the family*** (M. Spark. “A Member of the Family”).

*Detachment* is a stylistic device based on singling out a secondary member of the sentence with the help of punctuation [6]. The word-order is not violated in this case, but secondary members obtain their own stress and intonation because they are detached from the rest of the sentence by commas, as in the following example: *He was fast asleep, so soundly, so deeply* (K. Mansfield. “The Garden-Party”).

*Ellipsis* is a deliberate omission of words not essential to the meaning of the expression [6]. Elliptical structures are used in narrative texts mostly in the form of a dialogue. For example, a telephone conversation consists of incomplete and elliptical sentences, which makes it absolutely authentic and, in addition, adds expressiveness to the whole statement: *Good morning, dear! Come for lunch? To, dear. Amazing, of course. < ... > Your white? Oh, of course I should. One moment* (K. Mansfield. “The Garden-Party”). The presented elliptical sentences do not, in fact, simply serve to reduce the number of used words but help the speaker to draw the audience’s attention to the key message of the utterance.

*Aposiopesis* is the device of suddenly breaking off in the middle of a sentence as if unwilling to continue [5, p. 118]. It usually performs expressive and emotive functions in the utterance: *I can’t go against my nature [...]. I can’t be expected to* (M. Spark. “The Black Madonna”). In this case aposiopesis conveys sorrow, nervousness of the major character, the last degree of anxiety.

*Zeugma* is a figure of speech in which a word is used to modify or govern two or more words although appropriate to only one of them or making a different sense with each [5, p. 287]. It is vividly presented in “The Pickwick Papers” by Charles Dickens, where zeugma is used for humorous effect: *All these things, combined with the noises and interruptions of constant comings in and going out, made Mr. Pickwick play rather badly; the cards were against him, also, and when they left off at ten minutes past eleven, Miss Bolo rose from the table considerably agitated, and went straight home in a flood of tears and a sedan-chair.*

**Conclusion.** We share the proposition that the notion of compression is determined not only by the principle of verbal economy, but also by the pursuit of language expressiveness and emphasis. Having analysed the most typical cases of syntactic compression in artistic works, we can conclude that it inherently presupposes encoding and decoding of implicit information. Depending on the author’s intension, different types of syntactic compression perform various pragmatic functions. As a result, it efficiently serves not only the purpose of expressing thoughts but also of concealing them.

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## ONOMATOPOEIC VERBS OF SPEECH ACTIVITY IN THE BELARUSIAN LANGUAGE: CLASSIFYING AND STRUCTURAL PECULIARITIES

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Different kinds of sounds of surrounding world produced by human beings, animate and inanimate objects are expressed in every language due to its inner tendency to determine the special connection between them, their perceiving and the language's lexicon giving it the particular sounding character. This is the continuous process of enriching and developing the onomatopoeic expressions collection.

The study of onomatopoeia in Slavic languages is topical at the present stage within the scope of the nomination theory and phonosemantics (Russian) [S.S. Shlyakhova, 2003, 2004, 2016], in diachronic and synchronic perspectives (Russian) [E.V. Tishina, 2013], in phonostylistic and etymological aspects (Ukrainian, Slovakian, Czech) [Yu.V. Yusip-Yakimovich 2008, 2010, 2015], [Ch. Koleva-Zlateva, 2009]. As for Belarusian onomatopoeia, there is not still any comprehensive scientific research.

Thus, the aim of this article is to classify Belarusian onomatopoeic verbs of speech activity and to analyze their semantic and structural peculiarities.

**Material and methods.** Onomatopoeic verbs of speech activity served as the material, selected with the help of the continuous access method from relevant dictionaries [1, 2]. Definition analysis, statistical method, some elements of etymological and contextual analyses form the research methodological base.

**Results and their discussion.** So, lexico-semantic group of Belarusian onomatopoeic verbs of speech activity including verbs of articulate and

inarticulate sounds produced by people are represented in the following way (based on classifying Russian verbs of sound by L.M. Vasil'jev [3]):

1. verbs of the interjection character reproducing:

a) feelings (joy, sadness, fear, pain, wonder, admiration etc.): *ахаць, айкаць, вухкаць, хмыкаць* etc.;

b) treatment of an object

– stimulation (a will of a person, signals to animals): *нукаць, тпрукаць, псікаць, цыкаць, шыкаць* etc.,

– evaluation: *сюсюкаць, улюлюкаць* etc.;

c) baby talk: *азукаць, квіркаць, піцюкаць* etc.;

2. verbs of the manner of pronouncing particular sounds:

a) dialectal speech peculiarities: *акаць, дзэкаць, окаць, чокаць* etc.,

b) physiological speech peculiarities: *грасіраваць, гугнявіць, шапялявіць* etc.;

3. verbs, which define the sounding process and the type of the produced sound implicitly: *балакаць, бухцець, дудукаць, мармытаць, мямліць, тараторыць, шушукаць* etc.

The meaning of sound reproduction is frequently motivated by interjection (74%), rarely – by nouns (13%), or by certain sounds (14%): *войкаць, екатаць, акаць*. Structural and derivational feature of onomatopoeic verbs consists in their lexicalization due to adding affixes to the onomatopoeic base, which possesses the specific structure. Thus, the structure of Belarusian onomatopoeic roots is notable for its weak vocalism and monosyllabism (*вох, вух, зік, бух, хм, псік, тпру, цыц* etc.). Polysyllabism depends on reduplication both with simple iteration of bases (*ду-ду (дудукаць), зю-зю (зюзюкаць), сю-сю (сюсюкаць), улю-лю (улюлюкаць), шу-шу (шушукаць)* etc.) and with vowel gradation or rhyme while one of the components gets some phonetic-structural changes and means iteration of sound with the change of its quality (*бал-бол (балаболіць), мар-мыр (мармытаць), тар-тор (тараторыць)*). Regular and more productive word formation model of verbs of speech activity in synchrony is the motivating base + the formant *-а- / -ка-* (*ахаць, дзэкаць, зюзюкаць* etc.). In certain cases there are combining of the morph of the base with the derivational formant (*зікаць, псікаць, цыкаць*), incorporation of an interfix in the root of the verb (*хмыкаць, цокаць, шыкаць, тараторыць*), or phonetic changes of the formant (*бурчаць, сычэць, пукчэць*). The duplicate forms of verbs are frequently found in dialects of the Belarusian language while the formant *-k-* performs the diminutive function: *ахаць – ахкаць, вохаць – вохкаць, вухаць – вухкаць* etc., such lexemes acquire additional connotative meaning and are stylistically colored.

Special types of word formation represent expressivity of nomination and cause appearance of phonetic and semantic alternative forms of a word: iteration (*ёкаць > екатаць*) [2, vol. 3, p. 184] and contamination: *квіркаць* ‘about the

first sounds of babies' = *квікаць* 'to cry (about a duckling)' + *буркаць* 'to produce toneless sounds showing displeasure or threat (about animals)' [1, vol. 5, p. 13]; *кромкаць 2* 'to beg' = *кромкаць 1* 'to caw' + *канькаць* 'to beg' [2, vol. 5, p. 117]; *крумкаць* 'to be capricious (about children)' = *крумкаць 1* 'about toads, ravens' + *канькаць* 'to beg' [2, vol. 5, p. 123].

The majority of Belarusian onomatopoeic verbs are considered as semantic derivatives of Pra-Slavic roots, which have kept their onomatopoeic meanings and phonetic representation, for example: - *gŏgnati*, *\*gŏgniti* 'to nasalize' > Bel. *гугняць*, *гугнявіць* [2, vol. 3, p. 111]; - *\*(j)ękъ*, *\*jęčati* 'to moan and groan' > Bel. *екатаць* [11, Т. 3, с. 184]; - *\*žū-*, *\*žuzg-* 'yelp, squeak' > Bel. *жузнецць* [2, vol. 3, p. 244]; - *\*šьrьtъ*, *\*šьrьtati* 'to whisper' > Bel. *шаптаць* [4]; - *\*buxati*, *\*buxьtěti* 'to cry' > Bel. *бухцець*, *бухторыць* [2, vol. 1, p. 426, 427] etc.

**Conclusion.** Thus, the article provides the regular and special types of word formation of the onomatopoeic verbs of speech activity in the Belarusian language and describes such their significant semantic and structural features as: the existence of phonetic and semantic duplicate forms of a word in dialects, the additional connotative meaning and stylistic colouring of some lexemes, the stability of primary phonetic representation in the course of historical development.

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## SPECIFICITY OF INTERPRETATION OF LINEAR GEOGRAPHICAL OBJECTS TO THE ENGLISH LANGUAGE

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The formation of place names in different languages is a complex process that cannot be reduced to one or even several word-formation models. The translation of toponyms should reflect cultural and national specific features and at the same time preserve the sounding of the translated name. Translation of proper names requires special attention, since errors in the translation of toponyms can lead to inaccuracies and misinformation.

The purpose of the given article is to study the peculiarities of translation of geographical names into English.

**Material and methods.** We conducted our research on the materials of the magazine “Geography”, the geographical atlas of Belarus and the geographical atlas of the continents and countries. While our research we used the following methods: comparative, descriptive-analytical, a method of linguistic analysis.

**Results and their discussion.** The geographical name is a proper name, constantly used in the language to denote a certain territory, object or area on the surface of the Earth, which has recognizable features. There are some types of geographical names:

- settlements (cities, townships, villages);
- administrative units (states, regions, districts);
- natural objects (rivers, mountains, capes, lakes, seas);
- artificial structures (dams, airports, roads);
- locations and areas with undetermined boundaries;

Proper names are used in all spheres of human activity, they occur in a variety of functional styles. There are several ways to translate proper names: transliteration, transcription, calquing and mixed translation.

Transliteration is a way of translating the lexical unit of the original by recreating its graphic form with the help of the letters of the translation language. While using this method of translation, the written version of the name is not corrupted, however, the disadvantage of the practice of direct transfer is that speakers in other language often can't determine by writing how a foreign-language name is pronounced. Transferring the name in unchanged form, the speakers of the receiving language often impose a pronunciation corresponding to the rules of reading in their native language. E.g. *Любань* – *Lyuban'*, *Ивацевичи* – *Ivatsevichi*, *Чашники* – *Chashniki*, *Дубровно* – *Dubrovno*, *Минская возвышенность* – *Minskaya vozvyshennost'*.

Translational transcription is a phonemic recreation of the original lexical unit using the phonemes of the translating language. It's a phonetic imitation of the original word. This method of translation is intended to transfer the sounding of the original word but also includes elements of transliteration. The greatest advantage of transcription is that it makes the pronunciation of the foreign names easier. Although the name may sound strange and be unusual for the reader's articulatory system, one can approach to its oral form when reading it in transcription. E.g. *Костюковичи* – *Kastyukovichi*, *Калинковичи* – *Kalinkavichi*, *Мосты* – *Masty*, *Ошмяны* – *Ashmyany*, *Беловежская пуца* – *Belavezhskaya pushcha*, *Светлогорск* – *Svetlagorsk*.

Calquing is a way of translating a lexical unit of the original by replacing its constituent parts (morphemes or words) with their lexical correspondences in the translating language. However, calquing is an



undesirable technique for the translation of foreign names, since the address function of toponyms is decreasing. Nowadays calquing does not correspond to the existing tendencies and norms for the translation of toponymy and is not used for the translation of new toponyms. E.g. *Красная площадь* – *Red Square*, *Мыс Доброй Надежды* – *Cape of Good Hope*, *Долгое озеро* – *The Long Lake*, *Солёное озеро* – *The Salt Lake*, *Гора «Камень»* – *Mount «Stone»*, *Река св. Лаврентия* – *St. Laurence River*.

It should be pointed out that before translating you should carefully look at the name of the object and try to separate the name of the parts of the world (southern, northern, eastern and western). Geographical objects, which contain a part of the world in its name are translated in a combined way. Thus “Северная Двина” should be translated as “Northern Dvina”. E.g. *Новый Орлеан* – *New Orleans*, *Чёрное море* – *Black Sea*, *Станция Октябрьская* – *Oktyabrskaya station*, *Западная Двина* – *Western Dvina*, *Улица Белорусская* – *Belaruskaya street*, *Каховский переулок* – *Kakhovskiy lane*.

**Conclusion.** Thus, the use of such translation methods as transliteration and transcription allows to transfer the sound covering of the source word. However, calquing is an undesirable technique for the translation of foreign names, since the address function of toponyms is decreasing. The choice of a translation method is often determined in a dictionary, but there are cases, which include related to historical and cultural names, rare geographical names, new terms that require individual decision of an interpreter.

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## BELARUSIAN-POLISH-RUSSIAN-LATIN BOTANIC DICTIONARY AS AN IMPORTANT LEXICOGRAPHICAL WORK (FOR 125<sup>th</sup> ANNIVERSARY SINCE THE BIRTH OF ZOSKA VERAS)

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The Belarusian writer and public-cultural figure Zoska Veras (the pen name of Liudvika Antonovna Voitsik, 1892–1991) was in the centre of the Belarusian national movement of the 20th century. Liudvika Antonovna worked as a secretary at Minsk department of the Belarusian Association of



Assistance to the War Victims, at the Belarusian National Committee, at the Central Council of Belarusian organizations and at Belarusian Socialist Hramada. In that period the organizations as well as their members - the outstanding political and cultural figures of Belarus such as M. Bahdanovich, U. Halubok, V. Lastouski, Yadvihin Sh. and others – are visualized in Zoska Veras's memoirs and letters. Her important work is "Belarusian-Polish-Russian-Latin Botanic dictionary".

The aim of the research is to give a structural description of the botanical terms of this dictionary, to reveal the etymology of some names, to distinguish groups of botanical terms by origin and semantics.

**Material and methods.** Material of the research is the Belarusian vocabulary of Zoska Veras's "Belarusian-Polish-Russian-Latin Botanic dictionary". Research methods: descriptive, structural, etymological, lexical-semantic methods of research of linguistic units.

**Results and their discussion.** In 1924 in Vilnius for the benefit of science and practice Zoska Veras published "Belarusian-Polish-Russian-Latin Botanic dictionary". It was the first edition of such kind in the national language. For an amateur botanist, it was a great success. Zoska Veras began to work on it in autumn, 1918 when she had to leave Minsk due to family conditions and settled in the small estate of Olkhovniki owned by her grandfather. When compiling the dictionary, she used the experience and data from previously published books: "The People of Belarus" by M. Fedorovsky, "Russian-Belarusian dictionary" by M. and G. Garetski, "Improvised Russian-Kryvski (Belarusian) dictionary" by V. Lastousky. She collected her own materials in the Sokolsky povet for several years, studying the species number of plants, recording their names, which were used by local inhabitants.

So Zoska Veras managed to collect and include 424 names of 302 species of plants in her dictionary. Among them there were more than 90 medicinal plants. In 1924 together with the dictionary the writer published a popular brochure "The History of Herbal Use in Treatment", which describes the medical significance of many useful plants.

The dictionary of Zoska Veras consists of four parts: a four-language dictionary and three alphabetical indices in Polish, Russian and Latin. The names are given in alphabetical order.

The dictionary shows the richness of the active folk language, its original botanical terminology: *zhabiny vochki* – *niezapominajki* – *forget-me-nots* – *Miositus palustris*; *Joutazel* – *janowiec* – *woodwax* – *Genista tinctoria*.

All Belarusian names of plants can be classified according to the structure:

simple (one-word) word-names: *blyokat*, *porhauka*, *rusalnitsa*; terms-word combinations: (*gusyachy lapki*, *varoniae zhyta*, *suhotnik palyavy*); complex word-names (*brat-z-syastroy*, *verbaloz*, *chortapalokh*).

Some names are distinguished by an interesting folk etymology. For example, the name of the plant “brat-z-syastroy” (“*Brother-with-Sister*”) comes from the legend: separated in childhood brother and sister fell in love but could not get married and turned into the grass. The names of plants “*Pyatra i Paula kluchyki*”, “*sviatajannik*” (the plant that blooms on St. Jan's day) are associated with the religious worldview of Belarusians.

Consistent reflection of qualities and features in the names of plants makes it possible to distinguish thematic-semantic groups of terms that reveal the internal form of the name:

- the names according to the place where the plant grows (pauzun palyavy, mjatlitsa balotnaya, syhotnik lesavy);
- the names of plants that show belonging (valovaye vochka, zyazulchyny slyozki);
- the names of plants by color (narczyz bely, charnushka, chervonyya yagady);
- the names of plants to taste (kislets, garchytsa);
- the names of plants by the structure of their parts (garlachyki, strelki, ragulki, kapytnik);
- the names of plants by impact on the humans (durman, dzhyguchka);
- the names of plants for practical use in folk medicine (sardechnik, goynik, maczaunik).

**Conclusion.** The materials collected by Zoska Veras in the “Belarusian-Russian-Polish-Latin dictionary” have obvious, unique value. This dictionary was necessary when Belarusian scientific terminology needed to be formed and systematized.

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## SYNONYMS IN RUSSIAN JOURNALISTIC TEXTS

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The question of lexical synonymy has existed in philological science since its inception and remains relevant up to the present day. One of the main functions of synonyms is interchangeability. It allows both the speaker and the writer to make the speech more colorful and accurate, which can be especially important for journalists. Traditionally, synonyms are words that denote the same concept, identical or similar meaning of words that are related at a given time in the language, and serve to detail and distinguish the

subtle semantic nuances of the concept or to outline expressive, stylistic, genre distinctions and other differences. [1, p. 91].

The relevance of this work comes from the need to study the stylistic functions of synonyms in modern publicist discourse.

The aim of this work is to identify the main problems of lexical synonymy, to define the role of synonyms in journalistic texts and study the synonyms as the means of expression.

**Material and methods.** After analyzing modern journalistic texts published on the website TUT.BY, we have identified stylistic features of the used synonyms.

**Results and their discussion.** Based on the differences in the shades of semantic and stylistic coloring, most researchers highlight the three most common discharge synonyms: semantic synonyms, stylistic synonyms, semantic-stylistic synonyms.

Semantic synonyms allow to express the subtlest semantic shades and are also used to avoid repetition of the same words.

By A. Evgenieva, the word **mark** is used as a dominant of the synonymic set **mark – score – point** [2, p. 780]: *However, an important condition for such entrance will be **marks** of at least eight **points** for core subjects* [3]; *In the beginning, Stas had low scores, especially in painting. And now he gets eights, and in drawing – tens* [4]. These synonyms are common designations for the degree of knowledge and behavior of students. The word **score** is mainly used in official speech; **point** is a digital mark that has been accepted in the pre-revolutionary educational institutions (so-called six-point or twelve-point system). Now this word is rarely used, mainly, in combinations **put, get a high point** [2, p. 780]. Taking into account the above mentioned examples, we can see how the authors of these articles avoid tautology with the help of the ideographic synonyms. Nouns **eights** and **tens** are not the components of this synonymic set, but they embody its meaning: transmit the level of the knowledge in the subjects.

It is generally known that stylistic synonyms are words that have the same meaning, but belong to the different styles of our speech. The most important stylistic function of synonyms is to be the means of the most objective expression of author's thought. The dominant of the synonymic set **wife – spouse – life companion** etc. is the word **wife**, because it is the basic word for the designation [2, p. 335]. The noun **spouse** is used when people want to express respectfulness and politeness; **life companion** is used in a somewhat upbeat speech, which has a familiar humorous-ironic character, for example: *According to the resident of Newton Falls, Daniel Moore, he and his **wife** Liza found out that they would be visited by Zuckerberg, only 15 minutes before had arrived* [5]; *Vladimir Gennadyevich went on a trip by "White Russia" together with his **spouse** and brother* [6]; *The founder of the American band Bon Jovi and his future **life companion*** [7] *met in high school, where they started their*

*relationship*. These synonyms belong to different functional styles of speech; therefore, their use is due to stylistic features.

Semantic-stylistic synonyms are a group of synonyms which combines the differences in shades of lexical meaning and stylistic differences. These types of synonyms are repeatedly found in journalistic texts and are used by authors as an expressive tool.

Verbs often form semantic-stylistic synonymic sets. For example, the reference word of the verbal synonymic set **to say – to declare – to express** is the verb **to say**, which has the widest meaning: to express one's thoughts aloud. **To declare** is to inform about something that is decided and accepted for the speaker, that really exists, etc.; **to express** is to say your opinion [2, p. 240]. For example: *The world has changed, and now one of the most important qualities for survival is the ability to say "No!"* [8]; *At the same time, the former Prime minister **declared** that he would not quit his charitable foundation to become a member of the British parliament again* [9]; *The passengers did not hurry to **express** their opinion, first looked and figured out why there should be spent more time* [10].

**Conclusion.** So, it can be noted that synonymy is a “dynamic” section of lexicology. With all the diversity of synonyms which the Russian language is full of, journalists often meet the problem of choosing the single and the most suitable one. To express their thoughts in the most accurate way authors use various synonyms to avoid tautology and to link sentences in the text.

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## LINGUOSTYLISTIC PECULIARITIES OF THE ENGLISH POLITICAL DISCOURSE IN HILARY CLINTON'S AND DONALD TRUMP'S PRE-ELECTION DEBATES

### A. Runets

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The term “political discourse” is a central concept of the political linguistics and has its aim to get and hold political powers over the public opinion [8, p. 32–43]. The urgency is determined by insufficient studies of usage patterns of political discourse.

The aim of our research is analysis of the linguostylistic peculiarities of English political discourse in Hilary Clinton's and Donald Trump's pre-election debates.

**Material and methods.** In the course of the research we analyzed over 50 examples of linguostylistic peculiarities of the opponents using the method of theoretical analysis and synthesis, descriptive and comparative method.

**Results and their discussion.** The absolute majority of occurrences in political discourse refer to lexical and phraseological level; fewer refer to different stylistic devices. The researchers single out the following linguostylistic peculiarities of English political discourse:

1. Metaphors are responsible for forming positive or negative opinion of a political unit [2, p. 13–14].

**H. Clinton:** 1) “You know, your campaign manager said that you built a lot of businesses *on the backs of little guys*”; 2) “You call yourself *the King of Debt*”; 3) “And we have to tackle *the plague of gun violence*”.

**D. Trump:** 1) “You called it *the gold standard*”; 2) “You get a subpoena, and after getting the subpoena you delete 33,000 emails and then you *acid wash them or bleach them*, as you would say”.

2. Euphemisms are used for embellishment of reality and for the manipulation of the listener's consciousness to create the desired picture of events.

**D. Trump:** “And the reason I say that is not in a *braggadocios way*”.

**H. Clinton:** “I don't think *top-down* works in America”.

3. In their speeches they use the pronouns *we*, *us*, *our* to make the listeners believe that they belong together to one unity.

**D. Trump:** 1) “But we have to stop *our jobs* from being stolen from *us*”; 2) “When they sell into *us*, there's no tax”; 3) “*We* are a nation that is seriously troubled. *We're* losing our jobs”.

**H. Clinton:** 1) “The central question in this election is really what kind of country *we* want to be and what kind of future *we'll* build together”; 2) “That means *we* need new jobs, good jobs, with rising incomes”.



4. The usage of the words with negative connotation is aimed at the abolishment of the opinions and the censure of the opponent's personality and actions.

**D. Trump:** "And I will tell you that when Hillary brings up a point like that and she talks about words that I said 11 years ago, I think it's *disgraceful*".

**H. Clinton:** "We have seen him *insult* women".

5. Usage of the superlative and the comparative degrees of adjectives stand for the expressiveness of the speech.

**D. Trump:** 1) "Now, look, we have *the worst* revival of an economy since the Great Depression"; 2) "It is *the single greatest* threat that this country has".

**H Clinton:** "We had *the worst* financial crisis, the Great Recession, the worst since the 1930s".

6. Rhetorical questions sound like a call to action, to awake the civil activity.

**D. Trump:** 1) "Is this a war-torn country?"; 2) "So is it President Obama's fault?".

**H. Clinton:** "Are we going to lead the world with strength and in accordance with our values?"

7. Passive voice helps to withdraw from the spotlight one of the participants of the situation, which helps to reduce its responsibility for the incident.

**D. Trump:** "The African-American community – because – look, the community within the inner cities has been so badly treated".

Also we found other linguostylistic peculiarities, i.e. H. Clinton uses some references to family matters. It shows how much the family means for her: "Today is my granddaughter's second birthday, so I think about this a lot. He started his business with \$14 million, borrowed from his father, and he really believes that the more you help wealthy people, the better off we'll be and that everything will work out from there".

Some parallel constructions and repetition:

**D. Trump:** "So Ford is leaving. You see that, their small car division leaving. Thousands of jobs leaving Michigan, leaving Ohio. They're all leaving".

**H. Clinton:** "Will they create jobs in America? Will they raise incomes in America? And are they good for our national security? I want us to invest in you. I want us to invest in your future".

Antithesis:

**D. Trump:** "I'm going to cut taxes big league, and you're going to raise taxes big league, end of story".

**H. Clinton:** "When I hear something like that, I am reminded of what my friend Michelle Obama advised us all. When they go low, you go high".



Parallel constructions, repetitions and antithesis create a rhythm of an utterance.

We also observed the reference to important political figures in Trump's utterances connected with their political career and with the attitude of voters towards them. For example, Reagan is for positive meaning ("That's going to be a job creator like we haven't seen since Ronald Reagan"), while Obama is used to be blamed for all failures ("When I watch what's happening with some horrible things like Obamacare where your health insurance and health care is going up by numbers that are astronomical: 68%, 59%, 71%").

**Conclusion.** According to the results of our research we can say that the main linguostylistic peculiarities of English political discourse are metaphors, euphemisms, the first person pronouns and the words with negative connotation, the superlative and the comparative degrees of adjectives, rhetorical questions, and the passive voice. Also we distinguished some parallel constructions, repetitions, antithesis and reference to some political figures and family matters.

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**SPECIAL DIFFICULTIES IN TRANSLATING SCIENTIFIC  
AND TECHNICAL TERMINOLOGY  
(ON THE EXAMPLE OF TV-SERIAL "BIG BANG THEORY")**

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In modern linguistics scientific and technical terminology is widely spread due to the recent development of science during the last century. This kind of terminology is used practically in every sphere. Thus it seems quite necessary for students to be aware of some peculiarities while translating terms from English into Russian. And naturally it hasn't missed the sphere of mass media. So this article is going to cover some peculiar difficulties of translating terms into the popular scientific language. And the results of this research can be regarded as a contribution to the theory of popular scientific style and types of terminology used.

The relevance of our work is predetermined by the widespread use of terminology, because of popularization of science in the society. Thus this

article contributes to the research in this sphere, examining the aforementioned issues on particular examples.

The purpose of this work is to analyze and consider specific peculiarities in translation scientific terms, using the material of the TV-serial «Big Bang Theory».

**Material and methods.** While writing this work, the scientific and technical materials and vocabulary of some episodes of TV-serial «Big Bang Theory» were used.

When writing the article, descriptive, comparative research methods and the method of stylistic analysis were used.

**Results and their discussion.** We have examined a number of examples of the use of the terminology in a TV-serial «Big Bang Theory». The translation of an interpreter Diagoz with the correction of Gellard was used.

We shall take the monologue of Leonard from the 2<sup>nd</sup> series of the 1<sup>st</sup> season as an example.

*Leonard: We are the intellectual descendents of Archimedes. Give me a fulcrum and a lever and I can move the Earth.*

The following translation is offered:

*Леонард: Мы интеллектуалы, последователи Архимеда. Дай мне точку опоры, и я сдвину Землю.*

The problem at issue here is the principle of a lever. The lever is one of the easiest mechanic structures. It's represented by a tough beam, which can revolve around a fulcrum. A part of a beam from the fulcrum to the point of force application is called the lever [1, p. 48].

The lever is used to create more effort on a short lever with a help of less effort on a long lever (or to gain more shifting on a long lever with a help of less shifting on a short lever). By making the lever long enough, theoretically, any effort may be created. This term is commonly scientific and his place in this context is quite clear to an average man and is used here to describe the character as «the intellectual descendents of Archimedes» and good specialists in general.

The next dialogue we're going to examine takes place between Leonard and Sheldon:

*Leonard: Easy, easy. OK. Now we've got an inclined plane, force required to lift is reduced by the sine of the angle of the stairs... Call it 30 degrees, so about half.*

*Sheldon: Exactly half.*

We have the following translation:

*Леонард: Теперь мы имеем наклонную поверхность, сила, необходимая для подъема уменьшается благодаря тому, что синус угла равен 30 градусам, и поэтому силу надо приложить вдвое меньшую.*

*Шелдон: Ровно вдвое.*

So as to understand the aforementioned dialogue we must consider the notion of the vector. The vector in physics is an object, characterized by the size and direction. Thus if the position of the vector has changed from 90 degrees of the gravity to the position of 30 degrees, there'll be no need to overcome the gravity after all. In this case we're dealing with a specific trigonometric term and the calculations of the main hero are unlikely to be understood by a large audience, which means that in this context the term was used to describe the character, but not to explain the mathematic phenomenon.

The next dialogue that is worth our attention takes place in Penny's apartment, where the main characters Leonard and Sheldon come, and see a lot of mess here.

*Leonard: So Penny is a little messy.*

*Sheldon: The Mandelbrot set of complex numbers is a little messy. This is chaos.*

We have the following translation:

*Леонард: Что ж, у Пенни несколько грязно.*

*Шелдон: Формула Мандельброта – всего лишь кучка цифр, если это несколько грязно. Это хаос.*

The center of our attention here is «The Mandelbrot set of complex numbers». It's a set of such points  $C$  on an integrated surface, for which the ratio  $Z_{n+1} = Z_n^2 + C$ , where  $Z_0=0$  gives a limited continuity. Thus it's a host of such  $C$ , for which there's such a real  $R$ , that inequality  $|Z_n| < R$  is true with all natural  $n$  [2]. The idea of Sheldon's joke is that the exact value of the surface of the Mandelbrot set of complex numbers is unknown. So here we deal with a specific mathematical term, which is used for connotation of the situation, but the term isn't explained to the audience.

**Conclusion.** Having examined some samples of the use of terminology on the example of a TV-series «Big Bang Theory», it seems quite necessary to carry out research on this matter, as it's widespread. By analyzing some parts of the dialogue, we've noticed that the use of some terms is various and thus this terminology must be translated according to the purpose of the use of the terms (for example, some terms should be explained, while others should be left as they are).

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## **THE PROBLEM OF READING ALOUD**

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Reading aloud is quite a common activity in academic and professional life. Firstly, it is unavoidable for teachers to perform in public or read aloud to their students, which requires correct and fluent presentation of information. Secondly, it is impossible to master reading and speaking skills based on the technique of reading. The students of our college experience real difficulties in reproducing texts in the classroom mentioning the fact that the performance on their own is definitely of better quality.

The main goal of the present article is to find out the reasons for poor performance in public, to make up the list of typical drawbacks in reading and work out possible ways to get rid of them.

**Material and methods.** Critical analyzing the scientific and the Internet sources, collecting information, questioning, sorting out and describing are helpful in our investigation of the problem.

**Results and their discussion.** The problem of reading aloud has always been of current importance even in our mother tongue. It is interrelated with a number of areas which present difficulties for learners of English and cause drawbacks in reading aloud.

One of the basic components of reading aloud is the technique of reading. It's a fundamental skill for using reading as an activity including the whole variety of strategies and methods such as skimming, scanning, critique etc. [1, p. 162].

The students of our college experience difficulties in all parameters of the technique of reading. 37% of them don't read at the right rate. Although very slow reading is considered to be better than fast one, future teachers' reading must fit the mold for perfect imitation is the way to perfect reading of unfamiliar texts.

“A foreign learner should be aware of the specific properties of different word-classes in English and of the conditions, under which deviations from the “normal” stress-pattern of an utterance may occur” [2, p.81]. Thus, some students fail to distribute correctly prominence of notional and function words in an utterance while the others are unable to stress the right syllable in polysyllabic words (12%).

Wrong pausation takes place in texts without intonation marks. Complex, compound and long simple sentences are illogically split into intonation-groups. Even simple sentences are reproduced haltingly with frequent pauses (49%).

Some students use inappropriate intonation-patterns or nuclear tones (9%).

One of the most obvious linguistic problems is the unreliability of English spelling, which leads to mispronunciation of English words. Reading aloud involves pronouncing unfamiliar sounds. Some errors occur because readers aren't aware of qualitative and quantitative changes in vowels or modifications in consonant clusters or do not observe them (17%).

Non-linguistic aspect of reading aloud is significant for understanding of the present problem as well. Normally such constituents as correct breathing, trained voice, clear articulation and appropriate volume are not put enough emphasis on [3]. Highlighting important and contrasting ideas by emphasising the words that carry them requires special training, too (12%).

The analysis of the respondents' opinion enables us to sort out the reasons for poor reading aloud.

The students of all groups (81%), even fourth-year students, experience extreme nervousness while reading. This problem needs detailed psychological consideration by a specialist in this area in order to work out possible ways to get rid of them.

In some cases nervousness is caused by fear of getting an undesirable mark for reading aloud (34%).

Some respondents (21%) admit that their poor reading aloud is the result of their insufficient efforts and preparation at home.

Mostly second-year students (17%) think they haven't acquired necessary skills in reading aloud yet.

Critical analysis of the scientific, Internet sources and the respondents' opinion enables us to put forward some helpful ideas concerning the prevention of poor reading aloud.

1. Make sure the student is motivated to practice this activity. The respondents consider reading aloud to be extremely significant for improving pronunciation and speaking skills first of all (70%). The analysis of the students' end-of-term academic progress in speech practice and practical phonetics shows that those who are not good at reading aloud can't express their ideas and thoughts fluently and with ease. However, for 25% of the surveyed getting a good mark is the major factor for achieving progress in this kind of activity.

2. Develop and improve the skills of the technique of reading, especially such constituents as rate, pausation, fluency of reading, the distribution of utterance-stress and the use of appropriate intonation patterns.

3. Pay special attention to comprehension the meaning of the text. A person who reads aloud and comprehends the meaning of the text is coordinating word recognition with comprehension and speaking and pronunciation ability in highly complex ways [4]. The students (91%) are not aware of their problem. Frequency of pauses in reading (49%), indistinct articulation of words in an utterance (15%), monotonous reading (12%) or inappropriate utterance-stress (12%) are likely to be the consequences of lack

of understanding. Correct comprehension enables to concentrate on the message of what you are reading and avoid the abovementioned drawbacks.

4. Non-linguistic skills such as breathing, voice, clear articulation and appropriate volume play an important part in public performance. That's why identify the problem and solve it using a system of exercises or training techniques for a corresponding area.

5. If there is a recorded model of the text for reading aloud it is desirable for students to listen to it as many times as possible.

6. It is advisable to rehearse the reading beforehand and make the recording of the performance so as to recognize and correct some faults in it.

7. If students' nervousness prevents them from performing well, use psychological recommendations to cope with his delicate problem.

**Conclusion.** Reading aloud is a very complicated and important phenomenon. It is based on the technique of reading and at the same time essential for all possible methods of reading and development of speaking skills. As the prevailing majority of students recognize the necessity to master it, clearing up the drawbacks and the factors which cause them becomes of paramount importance. Teachers should approach individually each student. All individual peculiarities are relevant here. Special attention should be paid to high level of nervousness during reading aloud. This issue requires detailed analyzing and studying and must be the topic of further investigation.

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## **SYSTEM OF MORAL AND ETHICAL VALUES IN MAXIM TANK'S LIFE AND POETRY**

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When you think about the development of Belarusian national poetry in the 20<sup>th</sup> century, considering its content and form, you unwittingly come to realize the considerable influence that the national poet Maxim Tank made on it. The notion of "Tank's poetry" includes the following: poems, which were composed at the highest level of modern poetic culture, the problematic



material for understanding innovative ways, genuine art and innovative essence of the poet himself. The notion also embraces his implementation of the most important conclusions of the aesthetic concept, his philosophy of poetic creativity. During a complex process of comprehension of distinguishing features of Maxim Tank's life path and creative ascent, we assumed that the poet lived in hard times. What gave him spiritual support, strength, self-confidence, despite countless trials of fate? This paper considers the personality of the poet not so much as an artist, a creator, but as a person, a son, a husband, a relative, in general, a person.

Maxim Tank's poetry has been analyzed by numerous researchers, but the thing that formed the personality of the poet, that inspired and helped him to live, served as an inexhaustible source for understanding his own life and public experience, has not yet been studied and described.

The purpose of the study is to analyze the system of moral and ethical values, its influence on the formation of the poet's personality and his creativity.

**Material and methods.** Poems, Maxim Tank's diaries, exclusive materials from the archive of the Skurko family, editions of his early books (originals), as well as the original letters to his brother Fedor, Maxim Tank's letters from his father, greeting cards for various holidays.

The subject of the study is a system of moral and ethical values in the personal life and creativity of Maxim Tank.

**Results and their discussion.** At the core of the research work are the memories of the poet's nephew, Ivan Fedorovich Skurko about his family which should be interesting and valuable for the whole Belarusian nation, and for him is a family history; about things that inspired the soul of the great Belarusian poet, things that supported him in hard times for all his life. What did Ivan Fedorovich tell us about this? All members of the Skurko family maintain close ties. The relationship of the creator with his numerous relatives, family life, relations with his fellow writers provided material for our study. It turned out that the most important moral and ethical values of the Skurko family are simple and understandable to everyone: this is a great respect for work, immense love for Belarus and its people, for the native Naroch lake, the native village of Pilkavshchyny, for the country life, and, of course, for the closest ones: great-grandparents, great-grandfather and grandfather, uncle Faddey, his mother, sisters and brother. We met the poet's nephew, Ivan Fedorovich Skurko, and he gave us the first book by the young Maxim Tank – "On the stages" (Vilnius, 1936). The book was seized, only a few copies remained, one of which we held in our hands. We decided to find the reflection of the poet's values in his creative works by analyzing the Collected Works of Maxim Tank, published by the Library of the Writers' Union of Belarus in 2010. The book includes all his famous pieces of poetry.

The native land for Maxim Tank was always the source of inspiration for the poet. Each creator has his own corner, as they say “the promised land”, through the prism of which he looks at the world. Throughout his creative career, the poet constantly returned with his thoughts to his native Myadel district. An important archetype of his poetry is *bread*, which serves as a symbol penetrating lots of Maxim Tank’s poetic works. In the concept of bread Maxim Tank always implies a lot more than just a type of food or the means of subsistence, it is, above all, a concern for everything that determined the poet’s life and creative program. In the image of bread one can trace the history of his native land, the fate of the poet. Exploring the works of Maxim Tank, we have come to the conclusion that the poet is deeply convinced: all his work, all his songs stem from his native land: *І калі пачаў я – // Жменьку за жменькай // Прасяваць нашу зямлю, // Убачыў на дне рэшата // песні* [1, p.196].

Maxim Tank devoted a lot of poems to his relatives: his grandmother Ulyana, his grandfather, his father and mother, his beloved wife, his children and grandchildren. The poet cherished every detail, every moment connected with his loved ones. We established this by analyzing his works. For instance, the image of the mother was feeding the poet’s social and moral energy throughout his life: «Матчына малітва ... не раз вяртала” мастака “нават з-за свету» [2, p. 241].

**Conclusion.** More than 100 poems by Maxim Tank from different periods of his life have been studied. As a result of the study of moral and ethical values in Maxim Tank’s poetry, the following conclusions have been made. Since childhood, the poet’s personality was evolving in the family. Formation of the poet’s personality is based on the principles of family laws of the Skurko family: respect for the parents, fidelity to motherland and family traditions, great value of bread as it is the result of man’s labour.

The system of moral and ethical values of the Tank-man and the Tank-poet are simple truths: great love and gratitude to the native land, native language, bread, the house that brought him, and to the closest people, to his family.

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## PECULIARITIES OF THE ENGLISH PRESS

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Since the 19<sup>th</sup> century the language of press has been considered as a special kind of communication that has its own system of linguistic means. It includes a system of coherent lexical, phraseological and grammatical means. These means serve both to inform and entertain readers. As a result newspapers contain not only information, but also author's comments. Not only articles, news and reporters' comments can be found in press, but also different stories, poems, crosswords and so on.

The purpose of the given article is to define the linguistic peculiarities of the English press.

**Material and methods.** We conducted our research on the material of the following newspapers: The Telegraph, The Daily Mail, Grand Prix of Russia, The Guardian and The Independent. While our research we used the following methods: the analytic method, the method of stylistic analysis, the method of linguistic analysis.

**Results and their discussion.** The language of press is constantly changing and developing. It should be laconic, simple and clear for everyone. Therefore, the biggest part of the press vocabulary is a literary and neutral language. However, while reading American periodicals you can encounter some peculiarities such as:

- special economic and political terms, e.g. *stability, elections, anti-terror work*;

- non-term political words, for instance *officials, hostages, kidnappers*;

- bookish words, including various figures of language, e.g. *war hysteria, escalation of the war, overwhelming majority*;

- various clichés, i.e. stereotyped expressions, ordinary phrases known to the reader, e.g. *long-terms agreements, a melting pot, to cast a veto over*. Clichés are the best way to show national-cultural peculiarities in printed texts;

- neologisms, nowadays words related to the Internet are the mostly widespread, e.g. *online auction, access provider*. Also, neologisms related to medicine and finances are commonly used. E.g. *dead cat bounce* (a rapid increase in the price of a financial asset after a period of substantial decline), *stealth tax*.

There are a lot of means of word-building. One of the ways to form neologisms used in modern publications is telescoping, or blending. Blending is one of the many ways new words are made in English. It refers to joining the beginning of one word and the end of another to make a new word with a new meaning [1]. The main idea is to create a new lexical unit, which combines and shows the meaning of its components. E.g. *netizen, e-lationship*.

- foreign words, some of them have been used in newspapers for a long time and others are becoming widely used nowadays. E.g. *bona fide* (from Latin, fair, honest), *glitch* (from German, difficulty), *schlock* (from Yiddish, careless work, odd jobs).

The above-listed points are the main peculiarity of the vocabulary of the English press, which can be encountered in articles and their titles. As a rule they lack emotional colouring, but some journalists use emotionally coloured words while writing their articles. Thus, the specific feature of English mass media is the use of colloquial phrases, jargon and slang. E.g. *5<sup>th</sup> graders freak out as teacher proposes to fellow teacher in class* [15.02.2017, The Daily Mail]. While translating into Russian an interpreter should avoid the use of jargon and slang in order to keep to the norms and to preserve stylistic peculiarities of the Russian language.

One more typical feature of the English press is the use of colloquial units in the most serious texts. While reading a newspaper you can often meet shortenings of names and surnames of famous people. E.g. *Bobby Kennedy* – *Robert Kennedy*, *Mac* – *Macmillan*. These colloquial forms are familiar to English people but they make a much stronger impression on the Russian reader. As a result in this case an interpreter should follow the norms which are peculiar for a certain genre in the Russian language.

It is common to indicate the title of a politician in English newspapers and magazines, even if he is criticized. If the surname of a politician is mentioned without the title, the shortenings *Mr* (*Mister*) or *Mrs.* (*Mistress*) should be placed in front of the surname. Titles and post mentioned in newspapers have formal meaning and do not show respect of a journalist to the referenced. Therefore, in translations into Russian titles are omitted excepting in especially official texts.

Another specific feature of this type of communication is omission of the verb *to be* in passive constructions. E.g. *Bomb squad called to beach after young boy picks up hoard of wartime bullets washed up on sand* [30.04.2017, The Telegraph]. Also, the verb *to be* can appear as a specific stylistic device that creates emphases and makes us think that someone's words are quoted although quotation marks are omitted. E.g. *Our Brexit illusions are about to be shattered* [29.04.2017, The Telegraph].

When reading American and British press you can encounter different types of shortenings. For instance abbreviations are often used in English newspapers and magazines: *NAACP* – *National Association for the Advancement of Colored People*, *NLRB* – *National Labor Relations Board*, *EEC* – *European Economic Community*.

A peculiarity of the English press is the use of various quotations and direct speech in headings. They are used in order to catch the reader's attention and to make some impact on him.

For the same purpose diverse tropes and figures of speech are used in mass media. E.g. *Red Bull is under the microscope again* [01.05.2016, Grand

Prix of Russia] – the metaphor *to be under the microscope* (i.e. to attract attention, to be under supervision) is used. *Can Le Pen beat Macron in the French Election, despite losing in the first round* [30.04.2017, The Telegraph]? – the rhetorical question is used.

Due to the fact that the mass media has a goal to influence public opinion journalists often use words with evaluative connotations. Headings contain not only information but also some assessment which is shown by means of a size of a heading, its position on a page, use of emotional words, etc.

**Conclusion.** Thus, the English press is characterized by great variability of language. There used not only neutral and literary lexical units but also diverse terms. One more significant feature is the use of colloquial words, jargon and slang. The American newspapers and magazines are characterized by the use of various clichés, neologisms, abbreviations and other shortenings. This type of communication is widely spread and as a result it should be simple and clear for everyone, it should change and develop.

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## ANGLICISMS IN FRENCH: SPHERES OF USE

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The number of Anglicisms increases every day in French. Anglicism is subjected to the process of adapting the linguistic unit to the rules and norms of the borrowing language is assimilation.

The aim of the objective is to establish the basic spheres of the use of Anglicisms in French.

**Material and methods.** The material of the research is English borrowings in French according to Internet sources [1, 2, 3]. During the work on the article we used the following method: quantitative data processing.

**Results and their discussion.** We start to consider the most popular English borrowings according to Internet sources. We can distinguish the following areas, which include English-language borrowings in French:

1. **The Internet** (14 Anglicisms): *chat, downloader (conjugable), followers, hotline, laptop, playlist, plugin, post, poster, rebooter (un ordi), screenshot, uploader (conjugable), le Web, zoom.*

2. **Cinema** (11 Anglicisms): *box-office, un casting, un one-man-show* (instead of *un spectacle en solo*), *pop-corn, un remake* (instead of *une*



*nouvelle adaptation*), *un sitcom* (instead of *une comédie de situation*), *spoiler*, *star*, *story-board*, *teaser*, *un thriller* (instead of *un film d'angoisse*).

**3. Sport** (11 Anglicisms): *un challenge*, *un coach* (instead of *un mentor*), *du fair-play* (instead of *du franc-jeu*), *fan*, *football*, *goal-average*, *jogging*, *match*, *shooting*, *un sponsor* (instead of *un mécène*), *une team*.

**4. Occupation** (8 Anglicisms): *un audit* (instead of *une vérification*), *boss*, *business model*, *un dealer*, *dispatcher*, *freelance*, *manager*, *du marketing* (instead of *mercatique*).

**5. Art** (5 Anglicisms): *un best-seller* (instead *un succès en librairie*), *la Fashion Week* (instead *la Semaine de la Mode*), *un hit-parade* (instead *un palmarès des chansons*), *interview*, *standing ovation*.

**6. Entertainment** (4 Anglicisms): *un dancefloor* (instead *une piste de danse*), *un disc-jockey* (instead *un animateur dans une boîte de nuit*), *DJ (disque-jokey)*, *hit-parade*.

**7. Policy** (4 Anglicisms): *business*, *garden-party*, *lobby*, *squatteur*.

**8. Technologies** (3 Anglicisms): *un airbag* (instead of *un coussin gonflable de sécurité*), *cutter*, *high-tech*.

**9. Time** (3 Anglicisms): *un after-work* (instead of *un petit pot entre amis après le travail*), *un prime-time* (instead of *une heure de grande écoute*), *week-end*.

**10. Cosmetics / Clothing** (2 Anglicisms): *du gloss* (instead of *brillant à lèvres*), *un pull-over* (instead of *un chandail*).

**11. Food** (2 Anglicisms): *une banana split* (instead of *banane chantilly*), *un brunch* (instead of *un buffet matinal*).

**12. Medicine** (1 Anglicisms): *un pacemaker* (instead of *un stimulateur cardiaque*).

**Conclusion.** According to the results of our research, the greatest number of Anglicisms operates in the fields of the Internet, cinema and sports. First of all, this is due to the importance of these spheres in our life. Internet terms allow you to adapt better to a virtual environment. The prevalence of Anglicisms in the field of cinema and sports is determined by the genuine interest of the French at their leisure time.

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## LINGUISTIC FEATURES OF INTERNET DISCOURSE

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In the modern conditions of computerization and globalization of our society, the Internet is actively penetrating into all spheres of human life. The global network has become a rich source of not only different types of information, but also of a specific communication environment within the framework of which specific linguistic features are created. Some researchers believe that modern development and expansion of information technology is a prerequisite for the emergence of a new “world” – the world of virtual communication, interaction between people in a computer network and mediated communication. In this way, the concept of Internet discourse is becoming a popular subject of linguistic research.

Internet discourse is considered to be a special type of speech, therefore, it is characterized by a wide range of linguistic features.

The aim of this paper is to highlight some of linguistic peculiarities of the Internet discourse.

**Material and methods.** Material for the research is taken from the TUT.BY Internet forum’s comments and dialogues. We used the following research methods: theoretical analysis of forum’s comments and dialogues, research and generalization of the obtained data.

The Internet forum is a thematic communication. Unlike chats, forums are dedicated to some specific topics. This form of communication has gained worldwide popularity. We can say that the forum is a club of interests, a place on the Internet where people are united by similar hobbies or ideas. They help each other with some tips and advice, share life experience, provide support.

**Results and their discussion.** One of the most distinct characteristics of the Internet discourse is the negligence of grammar, spelling and lexical norms. Due to the fact that communication on the Web often occurs spontaneously, misprints and various punctuation mistakes are inevitable: *Все о деньгах да о деньгах! Нет чтобы о высоком, моральном, нравственном.* This line illustrates that the content of the message is more important for the users than language accuracy, and they don’t pay attention to misprints, as well as to stylistic and punctuation mistakes. This is particularly true in the case of online forums and chats, where users try to express their thoughts on the spot and they don’t waste time checking the typed line.

However, lexical mistakes are not always made because of carelessness or illiteracy of a user. Quite often words or whole lines are modified and written contrary to the rules of the Russian language on purpose. Such distortions have found their place in Internet slang. One of the reasons for

these distortions is the fact that the Internet vocabulary reflects conversational phonetics, it means, that words are frequently written as they are heard, and their pronunciation can be deliberately beaten to add a comical shade. The most striking examples we have found on the Internet forum are: *превед* – a joking variation of the word *привет*, *пицот* instead of ‘пятьсот’, *пацталом* ‘под столом’, *ничё* ‘ничего’, *ваще* ‘вообще’, *щас* ‘сейчас’, etc.

The next feature of the Internet discourse is the popularity of lexical borrowings mainly from English. The over-saturation of Internet slang with English loan words is partly due to the fact that originally the United States were the creator of the global network, so the first language of the Internet was precisely English. In addition, the prevalence, popularity and relevance of the English language around the world have also played a significant role in borrowing English lexemes to the Internet vocabulary. There are the following examples at the forum: *Если и дальше будут ломать, то это не хулиганство, а перформанс?* (transliteration); *Большинство детей – геймеры* (borrowing words from the English computer jargon); *Нам нужен коннект* (borrowing professional English terms that already have an equivalent in Russian). Also, computer slang is becoming a popular form of slang among people who use computer, employed by both professionals (for example, IT specialists) and other computer users.

The linguistic features of Internet discourse include a large number of abbreviations and acronyms, which are mainly used to save time and space. These language tools have instantly taken root on the Internet, so you can see a lot of vivid examples in most forums: *комп* ‘компьютер’, *спс* ‘спасибо’, *нз* ‘не знаю’, *РБ* ‘Республика Беларусь’, *МО* ‘Министерство Образования’, etc.

This tendency can be explained by the fact that abbreviations and acronyms, just like the Internet slang, help users to identify each other, or to filter out those whose interests do not coincide with their own ones. This also explains the existence of special computer slang dictionaries, where one can find explanations of many expressions and abbreviations.

One of the most specific features of Internet discourse is its emotional component. In order to convey their emotions more clearly, users can turn to the excessive use of capital letters, for instance: *Я б такую скульптуру тоже – если б увидел – СЛОМАЛ БЫ!*; to using a large number of exclamation marks at the end of a phrase: *Да уберите наконец эту гадость!!!*; to reduplicating letters: *Воооот!*; mononuclear sentences-vocatives are also used: *Круто!*

The wish of the users to graphically display emotions has led to a wide use of emoticons, picture-tabs, character-symbol: *Хотели дождь – я дал вам дождь!))*). In this phrase, two parentheses at the end of a line perform an emotive function, not a function of punctuation marks. There may be cases

when a smiley made of punctuation marks can replace certain cues or emotions, for example: “(°\_o)” ‘I do not know’, or ‘I’m not sure’.

Emoticons such as smiley faces are a new language that is changing our brain, according to the new Australian research published in the journal “Social Neuroscience”. “Emoticons are a new form of language that we’re producing”, – says researcher Dr. Owen Churches from the school of psychology at Flinders University in Adelaide [1]. He says when we look at an image of a real face, we recognize the position of the mouth relative to the nose and the eyes, and as a result very specific parts of the brain are activated, and almost the same happens when we see emoticons.

**Conclusion.** Internet discourse as a part of the communicative space has a number of distinctive linguistic features, which are reflected in the speech of the communicants of the Global Internet Network. We believe that the study of linguistic features of Russian-language Internet sites in Belarus is a promising research direction, since it allows to identify the specific traits of virtual language space, as well as to identify some trends in the development and functioning of the Russian language in Belarus.

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**METAPHOR AND METONYMY  
(ON THE BASIS OF ENGLISH ADVERTISING TEXTS)**

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The usage of the figures of speech is the most wide-spread and successful way of any language development. The main aim is to create imagery and to motivate reader`s attention. Without expression, it would be poor and inexpressive. The purpose of the work is to show the significance of such stylistic devices as metaphor and metonymy and to determine its appearance on basis of English advertising texts.

The topicality our research lies in the current trends in the study of metaphor and metonymy in the light of various theories. The phenomena of metaphor and metonymy which attract great attention of researchers is not accidental. This is primarily due to common interest in the study of the text in the broad sense of the term (the study of all stylistic functional varieties of the literary language, including the advertising text, conversational style),

attempt to provide linguistic substantiation and interpretation of various stylistic techniques that create expressive text.

**Material and methods.** The material of the research is metaphor and metonymy in English advertisement. While working at the article we used the following methods: descriptive method with the elements of observation of linguistic phenomena; method of systematization, classification and comparison; analysis of various sources of information: publications in magazines, advertisement.

**Results and their discussion.** Various theoretical materials related to metaphor and metonymy, articles of modern linguists were analyzed in our work. These stylistic devices helps us to create additional expressive, evaluative and subjective connotations.

*Starting stylistic analysis, thus, one should bear in mind that the understanding of each separate component of the message is an indispensable condition of satisfactory work with the message as a whole, of getting down to the core and essence of its meaning. The most frequently used, is a metaphor that means transference of names based on the associated likeness between two objects (for example, "veil" for the "sky") [1, p. 23]. As we know, stylistics is a branch of science that studies the system of stylistic means and the functional styles of a language. Stylistic means are the system of a language means which serves to achieve the desirable effect of the utterance [1, p. 5]. The stylistic means can be divided into expressive means and stylistic devices. Words in context may acquire additional lexical meanings not fixed in dictionaries, what are called contextual meanings. The latter may sometimes deviate from the dictionary meaning to such a degree that the new meaning even becomes the opposite of the primary meaning. This is especially the case when we deal with transferred meanings. What is known in linguistics as transferred meaning is the interrelation between two types of lexical meaning: dictionary and contextual. The contextual meaning will always depend on the dictionary (logical) meaning to a greater or lesser extent. When the deviation from the acknowledged meaning is carried to a degree that it causes an unexpected turn in the recognized logical meanings, we register a stylistic device. The transferred meaning of a word may be fixed in dictionaries as a result of long and frequent use of the word other than in its primary meaning. In this case we register a derivative meaning of the word. The stylistic device based on the principle of similarity of two objects is called a metaphor [1, p. 23]. The term "metaphor", as the etymology of the word reveal means transference of some quality from one object to another. From the times of ancient Greek and Roman rhetoric, the term has been known to denote the transference of meaning from one word to another. It is still widely used to designate the process in which a word acquires a derivative meaning. Quintilian remarks: it is due to the metaphor that each*

*thing seems to have its name in language. "Language as a whole has been figuratively defined as a dictionary of faded metaphors. Let`s turn to the classification of metaphor. Most linguists suggest the following classification of metaphors including terms as:*

- 1) *fresh (original, genuine); 1) sustained (prolonged);*
- 2) *trite (stale). 2) unsustained.*

Metonymy also becomes instrumental in enriching the vocabulary of the language, though metonymy is created by a different semantic process and is based on contiguity (nearness) of objects or phenomena [1, p. 24]. Transference of names in metonymy does not involve a necessity for two different words to have a common component in their semantic structures, as is the case of metaphor, but proceeds from the fact that two objects (phenomena) have common grounds of existence in reality.

Metaphor and metonymy are similar in various aspects but the major difference is that if a metaphor substitutes a concept with another, a metonymy selects a related term [3]. So if metaphor is for substitution, metonymy is for association.

**Conclusion.** Summing up we would like to say about the fact that metaphor is used for substitution and condensation, a metonymy is used for combination and displacement. In a metaphor, the comparison is based on the similarities, while in metonymy the comparison is based on contiguity. Moreover we may say that it`s impossible to stop the process of the appearance of such stylistic devices. Without them people can`t imagine the development of a language. When analyzing the theoretical materials related to the topic of our work, it can be concluded that nowadays the English words have become an integral part of our everyday speech. The main reasons for such integration are expanding international relations and increased information flows, especially in advertisement that we can`t omit. The knowledge of such phenomena broadens the theoretical horizons of a language learner.

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**TRANSLATING ARTICLES ON AUTOMOBILE TOPICS FROM ENGLISH INTO RUSSIAN**

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“Top Gear” is a best-selling automobile magazine, which is released in BBC Worldwide. "Top Gear" is very popular among car lovers not only abroad but also in Russian-speaking countries. That’s why an accurate translation of this magazine is necessary which determines the topicality of the research.

The goal of our work is to determine specific features of translating articles on automobile topics from English into Russian.

**Material and methods.** The materials of the research are articles in the automobile magazine "Top Gear". We used such methods as descriptive – analytical, comparative and a method of linguistic analysis in our work.

**Results and their discussion.** One of the most difficult type of translation is technical translation, because for an adequate translation of technical texts into another language not only linguistic, but technical knowledge is needed [1, 3].

We have translated the article “Maserati GranTurismo” from BBC Top Gear Magazine UK Awards 2014 – 2015. – № 1[2]. Some cases, which caused the greatest difficulty, we will show as examples, then we will give their translation with comments.

For example, such word as “stock”. In the Russian language there is no analogue to this word, that’s why we can translate this word into Russian in two ways: 1) transliteration (as nowadays in automobile vocabulary the word “a stock” began to be used, and this word does not need to be explained in professional circles); 2) the selection of an equivalent. We chose the second method, because in this case the article will be understandable to a wider audience; so our translation is ‘базовая комплектация автомобиля’.

Another interesting case is as follows: “you’re feeling brave and wearing your most daring hat”. In this case, it would be inappropriate to translate literally, so it will be sufficient to generalize the meaning: ‘вы чувствуете себя дерзко и уверенно’.

While translating the sentence “Maserati was releasing a gengineered more 'sporting' version”, we met the hybrid word “gengineered”, referring to general literary vocabulary. This is a mix of the words genius + engineered. The translation turned out as : ‘Мазерати выпускает это чудо инженерии – более спортивную версию’.



And another example is “there is an element of skepticism floating fly-like in the Martini of my mood”. A conditional translation of this sentence here is not possible, because in Russian there is a similar but not fully relevant equivalent, so we used the way of contextual translation, and translated it as ‘эта мысль не давала мне покоя’.

So, bringing to the end the study of lexical features of scientific and technical texts, we have noted that among these features, the saturation of scientific and technical texts with special terms occupies the first place. Classifying them, we have come to the conclusion that the single-word terms (simple, derivative and complex) have a common word-building structure, and their translation can be done in a direct way with the search for their equivalents in dictionaries or by determining their meanings in the semantics of the root morpheme and affixes. It is more difficult to translate verbose terms, for which a strict hierarchy of components with strict semantic connections between the latter is characteristic. Components of verbose terms, formed either by free or stable word combinations, enter into a functionally conditioned morphological and syntactic connection and form a new terminological unit by their separate-total value.

In addition to terms, scientific and technical texts contain general scientific and common words, words from neutral vocabulary, which speaks of a complex structure of both English and Russian scientific and technical vocabulary, which determines the difficulties in translating this kind of texts. Thus, the use of terms in the scientific and technical literature is the key. But also terms can put us in a difficult situation in translation, because they are very polysemantic, and can completely change the meaning, depending on the adjective standing side by side.

Thus, we have translated the article "Maserati GranTurismo" telling about the car Maserati GranTurismo and its technical characteristics. The greatest difficulty in translating it caused:

firstly: the translation of professional vocabulary, as the translation of such vocabulary in dictionaries is carried out through transliteration. Therefore, in the translation of the article, we used this method of translation as the selection of an equivalent;

secondly: detailed and detailed statements, which, in the literal translation, can mislead the reader, it is more expedient to translate it through generalization;

thirdly: the translation of the word-hybrids, since it is not always clear from which word the part is taken, and how to translate the entire hybrid word. Therefore, the hybrid word must be translated by searching for its constituent words and translating each separately;

fourth: phraseological units, to some extent even authorial phraseological units. A literal translation of this phraseological turnover is not possible here, since in Russian there is a similar but not fully equivalent equivalent, so in this case we used the method of contextual translation.

**Conclusion.** Thus, studying specific translating features of texts on automobile topics we can conclude that the difficulty of their translation is determined not only by terms, but also by general scientific (general technical) and common words, words from neutral vocabulary. It speaks of the complex structure of both English and Russian scientific and technical vocabulary.

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## PSYCHOLOGICAL AND PEDAGOGICAL DETERMINANTS OF THE ESTABLISHMENT AND FUNCTIONING OF THE EDUCATIONAL SPHERE

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### COMPUTER TECHNOLOGIES ARE AS A METHOD OF CREATING A MUSICAL THESAURUS OF JUNIOR SCHOOLCHILDREN

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The use of modern computer technologies in education and musical education is becoming the object of particular attention of scientists and practitioners. It is contingently several items, the main of which is the improvement of quality education of individuals. It should be noted that the solution of many economic, social, political problems, satisfaction of vital needs people are directly dependent on the level and quality of education.

The study of literary sources allowed to educe directions of researches on issue affected in our research : the questions of electronic musical instruments the researchers of A.A. Volodin, V.I. Voloshin, S.G. Korsun, I.D. Simonov, L.I. Fedorchuk, etc.; the possibility of using computer capability in the art of music studied J.G. Dmitrioukova., D.Y. Dubrovskii, G.A. Evseev, A.P. Zagumennov, D.M. Rabin, V.S. Ulianich etc.; development and analysis of existing music and computer technology was carried out by G.G. Belov, I.B. Gorbunova, A.V. Gorelenko, P.P. Ivakin, G.N. Kotelnikova, O. Makarov, R.Y. Petelin, J. B. Petelin, M.J. Black, etc.

At the same time, the aspect of the use of the worked out musical programs on the lessons of music in primary school to form the musical thesaurus remains insufficiently investigated. The task of forming a musical thesaurus of younger students stems from the basic function of subject Music in secondary school and articulated in concepts and in educational standard as the mastery of key knowledge and leading music skills [1, p. 6].

On this basis, the aim of our research is theoretical justification of possibility of use of computer technologies and their practical testing to form the musical thesaurus of Junior schoolchildren at music lessons.

**Material and methods.** The material for our study are the lessons on the basis of the state educational institution "secondary school No. 11 of the city of Orsha". Were used the methods of empirical (observation, comparison, measurement) and theoretical studies (analysis and synthesis, generalization, classification, ranking).

**Results and their discussion.** The thesaurus according to the pedagogical encyclopedic dictionary is defined as dictionary language with full semantic information; as a complete systematic collection of data about a

field of knowledge. Educational psychology considers the thesaurus as the basis of the volume of training knowledge. Based on this, we define *a musical thesaurus as the system of musical concepts, allowing to focus on the theory and history of musical art* and represent a volume-based training musical knowledge. Without a base of musical knowledge, it is impossible to carry out the subjectivities of true spiritual, universal values.

Education is considered as a system of knowledge, abilities and skills corresponding to the expected learning outcome. In addition, the training is a result of learning, including cash available to date, the knowledge and existing methods and techniques of acquisition (ability to learn). The basic parameters of training are determined by educational standards.

In accordance with the age characteristics of Junior schoolchildren, summarized the key knowledge comes in stages, according to the years of study. The main stage for our study is a class 2. The core content of the subject at this stage is a system of musicological concepts (melody, tempo, dynamics, timbre, etc.), developing students in the process of practical music activities. The result of this stage is the formation of ideas about the means of musical expression and genres of professional music [1, p. 11]. At this stage, from our point of view, it is necessary to actively introduce the work of the music teacher computer technology.

There are many programs for working with music on the computer. However, the analysis of music programs showed that not all of them are acceptable for use in elementary school for a number of reasons. Based on the purpose of our study, we assumed limited to: training of computer music software, computer music games, music players, programs for singing karaoke, music editors, music encyclopedias.

We list only some modern computer music programs to form the musical thesaurus of children of primary school age:

- training program “Symphony orchestra Instruments” to study the theme of “Journey in the music of the country Opera, the Ballet, the Symphony, the Concerto is” school subject “Music” in 2 class. The program enters in the active dictionary of the child concepts: Symphony orchestra instruments, band, orchestra, conductor and music etiquette;

- electronic educational resource “Musical Islands” can be designed to organize the study of the topic “Means of musical expression” school subject “Music” in the 2nd year;

- game simulator “Paired images” aims to help children learn about musical symbols (note lengths, dynamic shades, the musical sizes, strokes, musical signs, pauses, duration of notes, key signatures, etc.);

- trainer “Magic garden” is aimed at formation of skill of fast reading musical notation as graphical information in the form of signs on a stave in two key signs, etc.

Main performance features the music information computer technology (three-dimensionality, animation, videos, sound, imitation of traditional

illustration techniques, interactivity, hypertextuality) allow you to effectively develop all kinds of perception of new material (knowledge, thesaurus) and use in the formation of a music thesaurus all types of memory: visual, auditory, motor, imaginative, and associative.

In recent years quite actively developed educational musical computer technology, targeted at primary school age. In this regard, we can talk about the formation of new teaching methods, which involve the interaction of a learner with educational music resources. The participation of the teacher in this case, minimally the role of consultant and controller of knowledge. However, by applying the information technology on the music lesson, it is important to remember that the music class in the first place, implies a living contact with the art.

**Conclusion.** Thus, the formation of musical thesaurus of younger schoolboys by means of computer technologies as dictated by the requirements of the concept and educational standards for the subject Music in school; the main performance features of the conceptual base in music and computer programs geared towards primary school age, can improve cognitive activity and involve students in the educational process; the use of computer technologies at music lessons strictly due to the challenges facing the educator in the training programme on the subject.

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## **USING COLOR-WORD ASSOCIATION TECHNIQUE IN THE CAREER PLANNING OF YOUNG PEOPLE**

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The creation of conditions for the formation of psychological readiness of young people in the planning and building a successful career is one of the key tasks both in secondary education and in higher education. According to M. Savickas, the person's readiness for career planning is determined by individual differences in personal traits, including also his motives, feelings, beliefs [1]. Accordingly, the purpose of practical support for career planning is to analyze of abilities, aptitudes and professional preferences and needs of the young people and their consulting on career issues. The organization of high-quality career consulting support is based on a comprehensive study of all personality characteristics and requires diagnostic techniques that allow

you to quickly receive psychological information about young people, especially in a mass survey. The solution of this problem involves the development and introduction of new diagnostic techniques in the process that would contribute to the development of readiness for planning and building a career based on domestic and foreign experience.

The aim of this work is to study the psycho-diagnostic capabilities of the Color-Word Association (CWA) methodology for assessing young people's readiness for career planning, their personal characteristics.

**Material and methods.** The CWA methodology was developed by Czech psychologists led by George Simonek (senior) in 1985 – 2005 [2]. The CWA technique is combined projective technique using calibrated sets of words for various areas of human activity (i.e. verbal modules 48–120 words) and a palette of eight colors of M. Luscher. Based on the theory of color perception of M. Luscher, when the relation of the subject to the color is determined by its emotional-motivational properties, the technique allows without distortion to identify the vocational needs and aptitudes young people for a successful career. In accordance with this method, the marking of different concepts three colors is an indirect indicator of the similarity of emotional attitude to these concepts. Analysis of the resulting association allows to describe the dynamics of internal ability to perceive the surrounding reality. The use of colors instead of the traditional questionnaires allows to get a reaction from the subject, which he cannot consciously affect, ignore or abort. Associations of the subject are monitored, evaluated and converted to results through a computer program called a sensor.

**Results and their discussion.** The Czech company DAP-Services is a pioneer in the research of CWA technique in such fields as education, sports, medicine, personnel management, career consulting, etc. Prepared by DAP-services of the results of the research programs allow to evaluate the psychological characteristics of the subject associations in a particular area. In particular, the assessment of readiness for career, gives a detailed analysis of the important characteristics of the personality. For the statistical analysis of the validity of CWA technology, the profiles of 20,000 adults aged 20 years and over were randomly selected from the DAP-Services database collected between 2006 and 2008.

Were tested two hypotheses (expert diagnostic constructs) by Lawrence E. Shapiro [3]. For these purposes have used the summarized color-association profile. It contains a record of choices of 56 possible triple color combinations to a specific word-object, commonly used in scanning via CWA technique and stored in the DAP Services a. s. database. The results of the testing by Lawrence E. Shapiro's constructs showed that the use of the method of CWA is reliable and effective. Based on that it is also possible to construct semantic factors (sets of word-objects focused on a specific area of an individual's/a group's behavior), which show a sufficiently high internal measurement correlation (reliability above 0.95).



**Conclusion.** Gomel Regional Center of Testing and Vocational Guidance of Youth at the Sukhoi State Technical University of Gomel in the framework of cooperation with the company DAP-Services conducted a test of hypotheses by Lawrence E. Shapiro with the help of CWA techniques of Russian-language selection consisting of 11th grade students from schools in the Gomel region (3,220 people). This led to the conclusion that the effectiveness and feasibility of using this technique in diagnostic practice.

This technology of CWA attracts attention with its ease of use, clear interpretation, heuristic possibilities. Interest in the use of the technique also reflects the objectives of professional counseling, the need for psychologists to have express-methods of diagnostics of readiness for career planning. Operational acquisition of psychological information is possible both in individual and in group form.

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## USE OF THE AUTHENTIC TEXTS IN THE TEACHING ENGLISH AT SCHOOL

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The main goal of teaching a foreign language in a general secondary school is the formation of students' ability to understand and tolerate attitudes toward representatives of a different culture. The relevance of the work is that this topic has not been thoroughly studied by methodologists. And it requires attention because the correct choice of the text depends on the continued success in learning a foreign language.

The aim of this paper is the theoretical substantiation and construction of a set of exercises that prepare students to read authentic texts not only in class, but also in everyday life.

**Material and methods.** The research is based on articles from the magazine "Foreign languages at school". As methods were used observation method and interviews with teachers to study their experience in using authentic materials in teaching foreign language at the senior stage.

**Results and their discussion.** For the formation of the optimal level of communicative competence, it is necessary to improve the abilities of

students in all types of speech activity. As a means of language communication, reading dominates in terms of prevalence, importance and accessibility. Learning to read in a foreign language is designed to provide receptive mastery of linguistic material and develop the cognitive competence of students, so as on the one hand, this is a kind of speech activity, and on the other, the basis for the formation of information and academic skills. At the older stage of learning, reading increasingly appears as an independent type of speech activity, when the student reads not so much to fulfill a study task as to get the necessary information from the text and use it. *Our pupils are interested in learning how peers live in the country of the studied language from the first lips, what problems he has to solve, how their lifestyle differs from ours and much more.* Even the best textbook in terms of the texts it contains is to some extent conservative, in the sense that there is no permanent update of information about the lives of speakers of the language being studied.

But it is this type of information that provokes a heightened interest and, consequently, has a positive effect on the motivation for mastering a foreign language [1, p.5]. Reading authentic texts when teaching a foreign language in a general education school, especially in high school, plays a primary role. At the heart of the motivation for reading is the realization of its usefulness and the need to expand the boundaries of knowledge through the development of reading in a foreign language. When you perceive an authentic text and decode it, when the national cultural environment and the reader's experience are far from the images of the text, there are distorted semantic representations or semantic "voids" that, unlike lacunas filled with resources of the reader's subjective life experience, are not filled in at all and remain in the student's mind "text spaces"[1, p.8]. Therefore, it is necessary to develop a special scheme for working on an authentic, foreign language text that would help the student develop a relationship to the text as a tool for learning new, a means of mastering the language and foreign culture in general. Learning to read foreign-language authentic texts involves choosing the right reading strategy with the goal that it is rational and effective. Search reading is part of the target aspect of teaching reading in the general education school. The strategy of search reading aims to find the information in the written text. In the opinion of psychologists, in the implementation of this type of reading, the emotional state of the reader is a state of maximum realization of all his abilities, an elevated state in which the text is assimilated in the best possible way. Training in search reading takes place on medium-sized authentic texts with the purpose of extracting supposedly semantic information: thoughts or facts confirming, refuting, explaining, explaining any objects or phenomena of foreign-speaking reality. When reading an authentic text, students do not understand the meanings of many words and phrases and often have to turn to the dictionary, which makes reading tedious and uninteresting. Interest (on the emotional level – externally, on the neurophysiological – in

reality) appears when the reader estimates the difference between the levels of knowledge available in memory and extracted from the text. Moreover, if the levels (from the text and memory) are high, then the difference between them will be more tangible emotionally (“Yes, I thought it was so, but in fact it is different!”) [3, p. 211]. And interest in the read information will be great. Therefore, in order to evoke interest in textual information, it is necessary to have quite specific information on this topic in the active memory (in the finished form on the "surface" of the memory, so as not to remember for a long time) to compare it with that obtained from the text. This should be facilitated by the organization of the pretext (or pre-text) phase of the work.

The study of theoretical materials and the analysis of the specialized literature on the problem of authentic materials have shown that although an active research work in this field has been conducted recently, the problem of determining and using authentic materials in the process of teaching a foreign language is still far from being solved, demanding special attention on the part of modern methodologists. Analysis of the use of authentic materials in the "Headway" revealed that the materials proposed in it meets the parameters and criteria of authenticity, and therefore, the use of this book at the senior stage is not only expedient, but also necessary, since this type of speech activity ensures the acquisition of those skills and skills that will really help graduates to communicate in a foreign language, without experiencing difficulties associated with understanding a foreign-language speech by ear. Observation at the lessons and questioning of students, as well as analysis of the practical use of authentic materials in the early stage of teaching listening, showed that, on the one hand, their use increases the motivation to learn a foreign language, since it makes the learning process more creative and interesting, but on the other hand requires a specially developed methodology, different from traditional, based on teaching materials. It should also be noted that, according to many leading methodologists, the use of authentic materials is necessary at all stages of teaching a foreign language in all types of speech activity, since it is the authentic materials that create the illusion of familiarizing with the natural language environment, introduce students to the culture and daily life of the country of study language, help to increase the motivation to learn a foreign language as an object. the study of theoretical materials and the analysis of the specialized literature on the problem of authentic materials have shown that although an active research work in this field has been conducted recently, the problem of determining and using authentic materials in the process of teaching a foreign language is still far from being solved, demanding special attention on the part of modern methodologists.

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**Conclusion.** It should be emphasized that the teaching of a natural, modern foreign language is possible only if materials taken from the life of native speakers are used or compiled taking into account the features of their culture and mentality in accordance with accepted and used speech standards. We are convinced that the organization of learning to read on a problematic basis will actively contribute to the formation of students' skills and skills to fully read authentic texts, which provides for the use of certain text signals to build hypotheses, assumptions at various levels. In the end, this should contribute to the correct semantic orientation in the authentic text and the successful search for the necessary socio-cultural information.

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**THE ANALYSIS OF EXPERIENCE ON FORMATION  
OF THE HEALTHY LIFESTYLE OF PUPILS OF SCHOOLS  
OF THE VITEBSK REGION**

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Health is influenced by a number of factors, including: ecological, socio-economic, psychophysiological. This means that fruitful work not only of the health care system, but also of the whole state machine, all

managements and departments, as well as of every citizen is necessary for ensuring health of the population.

The concept of health is relatively conditional and objectively established by a set of anthropometrical, clinical, physiological and biochemical indicators, determined with taking into account sexual and age factors, as well as climatic and geographical conditions [1].

In recent years intensified attention to the healthy way of life of pupils, it is connected with society concern about the increase in morbidity in the process of professional training, with the subsequent decrease in working capacity.

Therefore one of priorities of work of schools of the Vitebsk region is the formation of a culture of health and a healthy lifestyle of pupils. The realisation of this direction began in 2006, when the Belarusian State University and the Belarusian State Medical University developed a unified "Comprehensive Program for the Formation of a Health Culture, Healthy Lifestyle in General Education Schools", as well as the "Healthy Nutrition" program. These programs have been successfully implemented, work at the local and regional levels is continued.

The purpose of the work is to analyse the experience of formation of the healthy lifestyle of pupils on the example of the State Educational Institution "Polotsk Secondary School No. 1".

**Material and methods.** Base for the research were various secondary schools of the Vitebsk region in 2014–2017. Research methods: descriptive and analytical, interview, conversation, comparative, mathematical data processing.

**Results and their discussion.** Consider the formation of the culture of health and the healthy lifestyle of pupils on the example of the State Educational Institution "Polotsk Secondary School No. 1". The work is carried out in the following main directions:

***1. Health-saving organization of the educational process.***

By drawing up a timetable, whenever possible, physiological features and performance of pupils throughout the school day and week, need of alternation of mental and physical activity, as well as the difficulty score of this or that subject are considered.

The curriculum of additional education sufficiently fully reflects the needs of children for motor activity. School-based sports clubs have been working for many years: basketball, volleyball, football, track and field athletics, taekwondo, gymnastics, rhythm, karting "Virage", tourism and others.

Classes in these sections allow school teachers to fully implement the technologies of recovery of children by kinesiotherapy (recovery of children through a variety of movements).

The system of additional education in the school also allows the students to improve their health through aesthetic therapy and art therapy in classes in



creative associations, pupils of: "Vocal and choral singing", art studio "Rainbow", "Theatre creativity", etc.

**2. *The use of physical culture and health technologies aimed at the physical development of pupils.***

The school curriculum provides three lessons of physical training per school week for all students of the school. In addition, in the educational process besides "big" forms of training (physical education lessons, classes in sports sections and in the pool), "small" forms of classes are actively used.

The third hour of physical culture, classes in sports sections and in the pool, "small" forms of classes, which are introduced in the structure of the school day, allow not only to maintain the performance of students at a high level, but also to preserve and strengthen the health of pupils.

A sufficiently high percentage of children engaged in physical culture and sports in the State Educational Institution "Polotsk Secondary School No. 1" is 84.7%. This is achieved due to the fact that next to the school is the swimming pool "DK-Steklovolokno", IC "Olimpiets" in which a large number of children are engaged, which positively affects the health of pupils.

**3. *The monitoring of the health of pupils.***

In the 2017-2018 school year, the percentage of students with 1 group of health has increased again, the number of students with a third group of health has decreased.

**4. *Health-saving educational technologies.***

The most significant of all listed by the degree of their impact on the health of pupils. For example, *gaming technologies*. Are more used by primary school teachers. Non-standard lessons are widely used in practice: lessons-games, lessons-competitions, lessons-contests, lessons-excursions and others.

Technology of the *activity method*. The implementation of this technology is carried out in primary school since 2002 and brings its positive results: the elimination of stressful situations in the classroom, the opportunity to go beyond the boundaries of the textbook and to attract entertaining material as texts of training exercises, the individual approach in training, the formation of pupils' self-education and self-management skills, the formation of educational and cognitive motives among junior schoolchildren through the pupils' comprehension of the educational task.

*Information technologies*. The use of interactive training programs, which cause constant interest of schoolchildren, provide not only psychological unloading, but also provide developing and upbringing information, and also encourage to activate the independent cognitive activity.

**5. *The increasing of the motivation for keeping HLS.***

Various activities contribute to the formation of the health culture among pupils. Regularly held sports and recreational activities, for example, such as "Mom, dad, me – a sports family", health days, events "I choose life" and so on. School teachers use personal example to attract children to a



healthy lifestyle, participating in competitions in volleyball and basketball between the teams of pupils and teachers.

Every week in the State Educational Institution “Polotsk Secondary School No. 1” traditional class hours, film lectures, quizzes on the themes of HLS are held.

**6. “Healthy school nutrition”.**

Thanks to the modern equipment of the school dining room students, teachers, school staff receive steamed food. Modern filters for water purification have been installed. In the school dining room dietary dishes, health buns on the basis of Rekitsen are cooked, in the diet of schoolchildren iodized salt and rose hips syrup are introduced.

In 2017 the practice of using oxygen cocktails, which promote more efficient transportation of oxygen to internal organs, which also positively affects the health of children, has resumed in the primary school.

**Conclusion.** The formation of a value attitude to a healthy lifestyle as one of the aspects of social education is a process of systematic creation of social and pedagogical programs for the purposeful positive development of the individual with the goal of preserving and strengthening health. The introduction of medical-psychological and valeological requirements to the construction of the teaching and educational process will lead to the formation of motivation for health and behavioural skills of the healthy lifestyle among pupils and their parents.

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**METAPHORIC ASSOCIATIVE CARDS AS A TOOL  
FOR OPTIMIZING THE PROCESS OF PROFESSIONAL  
SELF-DETERMINATION OF STUDENTS-PSYCHOLOGISTS**

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Socio-economic changes in modern society place high demands on the professional training of specialist psychologists in the period of higher education. Professional formation of the future psychologist is a complete mental education, including specific attitudes and orientations, the synthesis of personal relationships and assessments of internal and external experience, reality and prospects, as well as one's own claims that are realized in a certain field of activity in the chosen specialty. Professional self-determination is a multifaceted, mobile process that accompanies the process of professional

development of the individual, during which a correction of the value-semantic sphere related to professional activity is carried out [1, p. 45]. To optimize this process during the professional training of psychology students, we developed a comprehensive program based on the use of such a new universal psychological instrument of work as metaphorical associative cards (MAC). This is a convenient method of both group and individual work, which allows you to work simultaneously with the emotional and mental spheres of personality.

The aim of the work is to optimizing the process of professional self-determination of students-psychologists at the early stage of their professionalization.

**Material and methods.** For the optimizing the process of professional self-determination of students-psychologists at the early stage of their professionalization, we created and have tested at one hundred and seventy students of the first, second, third, fourth and fifth courses on the basis of National Technical University "Kharkov Polytechnic Institute" a special MAC supervisory deck - projective method which focused on the sphere of professional self-determination.

**Results and their discussion.** Through this projective technique students described the images on the map, demonstrated his internal state, emphasized his own experiences, which allows not only to identify problem points, but also to find ways to solve them. Associative cards was used in training, individual and group forms of work, etc. The card deck developed by us used in diagnosis and corrective work with psychology students to detect and prevent certain complications on the path of professional development and self-determination. That is why associative maps are a valuable and interesting tool in carrying out work to optimize the professional self-determination of students-psychologists, because they enable: to identify and determine the range of problems that a student has with his own professionalization; carry out a projective analysis of metaphorical images that arise in the course of working with maps; identify the problems associated with the implementation of their own choices; identify ways to solve problems; to trace the main points of professional self-determination; to activate internal resources for self-determination and self-development; implement a dialogue between the internal and external; create favorable and comfortable conditions for self-discovery and self-knowledge [2, p. 7]. In the educational activity of future psychologists it is important to take into account the level of formation of professional representations, because they are directly related to the issues of mastering and further managing their own professional activity and personal professional development.

**Conclusion.** Analysis of the educational process in universities showed that the learning process influences the content, structure and dynamics of the student's professional self-determination [3, p. 20]. It is accompanied by a crisis of professional choice or a crisis of professional self-determination, indicates the need for social and psychological support. The presence of

difficulties in the process of professional self-determination of future specialists points to the need for targeted, prolonged work aimed at optimizing the professional self-determination of student psychologists. The MAC deck we propose is aimed at working with student psychologists in the sphere of professional self-determination issues and aims to increase the effectiveness of the processes of professional development and self-determination; enhancing the emotional stability of students; formation of skills of reflection and professional self-awareness, as well as development of skills to make decisions and plan further professional development.

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## **NEGOTIATIONS AS AN ALTERNATIVE METHOD FOR RESOLUTION OF DISPUTES IN THE SPHERE OF FOREIGN ECONOMIC ACTIVITY**

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In a modern, rapidly developing world, a world where business often determines the strategy for the development of not only a single state, but also strategic directions for the development of the world economy, the most acute is the question of how quickly and with minimum losses to solve arising in the sphere of foreign economic activity disputes. The most common, and in our opinion, one of the most profitable ways to resolve disputes in the field of foreign economic activity from the perspective of assets is negotiations

The purpose of the study is to analyze the main components of the negotiation process as one of the alternative ways to resolve disputes in the field of foreign economic activity.

**Material and methods.** This work uses normative legal acts regulating the procedure for carrying out negotiations as an alternative way of resolving disputes in the field of foreign economic activity. The main methods of research are the formal-logical method, analysis and synthesis.

**Results and their discussion.** Negotiations are a process by which the parties involved in a problem discuss it with each other, trying to reach a mutually acceptable agreement. In the relations between people there is a great variety of types of negotiations that can be conducted from different positions -

strength, law, interests. They can occur directly between the participants involved in the problem, or between the lawyers representing them.

One of the differences in the style of negotiation is particularly important. Negotiations can occur at the level of positions (positional bargaining) or at the level of principal interests (integrative negotiations). In the first case, the parties are «traded», i. each side sees the situation as a «win-loss», ie, to win it, the other side must lose. Even if they come to an ideal compromise, where each side has conceded equally, none of them satisfies their interests completely.

However, another strategy is possible, when the parties defend not their positions, but turn to those fundamental, deeper interests, the means of satisfying which these positions should serve. With this approach, it is possible to find a large number of other ways of satisfying the same interests, in addition to defending positions. Among these methods, there are often found those that suit both sides. This can be called a «win-win» strategy.

For example, each of the participants in a trilateral foreign economic transaction fiercely fights for «their» terms of the treaty, tries to draw one of the participants to their side, to ensure that the maximum number of the conditions offered by them is met. If you ask why this is done, the most likely answers of the participants will be: «To make me feel better», «This is in my interests». In fact, this positional struggle immensely harms the business and destroys the relationship between the participants in the transaction, i.e. interests are not really satisfied.

There are always differences at the economic and social level, in conditions of development, in personal characteristics, attitudes and values, in the ability to communicate effectively, in intelligence, in the ability to understand, etc.

In various studies of the specifics of the process of negotiations among participants of different cultures (for example, international commercial negotiations), certain peculiarities of the behavior of Russian representatives were revealed.

For example, both Germans and Americans note the following characteristic features of the Russian negotiators, making it difficult for mutual understanding between the parties:

1. poorly oriented in order to: characterized by a very abstract vision of the problem, or excessive detail (sometimes both, and the other together);
2. do not see alternatives in solving problems, do not compare different solutions;
3. take unclear, theoretical decisions that are not necessarily implementation-oriented;
4. seek immediate benefits, and solve problems slowly;
5. not initiative, tend to avoid responsibility;
6. do not think about the consequences;
7. do not tend to talk about conflicts openly;

8. firmly insist on their positions, it is difficult to make concessions.

In turn, in the Republic of Belarus the negotiators believe that their foreign partners:

- tend to belittle them, consider their way of thinking and acting preferable;
- do not look at Belarusians as partners, do not give them enough authority and responsibility;
- very mercantile, focused only on the benefit;
- do not think about social goals.

Comparison of the features manifested in intercultural and «internal» negotiations reveals a number of similar features. For example, in enterprises, managers behave more like «foreigners», and the collective puts forward the same claims that are typical for Belarusian negotiators. A number of features turn out to be common for both sides. Indeed, the external political system is an extension of the internal and, apparently, reflects a number of cultural features.

**Conclusion.** Both our differences and the conflict often lead to impossibility of effective communication in negotiations, inability to understand what others think, feel and believe in, unwillingness to act with respect for the needs, opinions and rights of others. When this happens, people can think that they have no other option than to go to court or even aggressive actions against others. Therefore, in many cases, the help of an open-minded, neutral mediator who is able to look at the situation «from the outside» is helpful.

## **THE REPARATIONS PROBLEM IN GERMAN SETTLEMENT (1945–1949): BASIC APPROACHES IN ANGLO-AMERICAN HISTORIOGRAPHY**

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The problem of German settlement takes a central place in the post-war international studies. The German question became one of the keys to the formation and collapse of bipolar system. In British and American historians' works the reparations problem is regarded as one of the main factors that led to German division after World War II.

The article aim is to define the main approaches in Anglo-American historiography to research of this problem.

**Material and methods.** Special publications of British and American research workers on the German problem in 1945 – 1949 served as the main sources to this article. The research is based on the principles of historicism,



objectiveness and value approach. Both general scientific and special historical methods are used.

**Results and their discussion.** During the research, three main approaches to the analysis of the reparation problem in the context of the German settlement in 1945–1949 were established. Representatives of the “*containment school*” in Anglo-American historiography proceed from the fact that in 1945–1949 the German policy of the USSR was based on a long-term plan. They are inclined to view Moscow's tough reparation policy as part of a plan to destabilize the economic and political situation in Germany with the aim of establishing Soviet control over the whole of it. As a result, the economic policy of the USSR, conducted in Germany, deepened the split between the eastern and western parts of the country and forced the three Western powers to take a course toward the creation of a separate West German government. Thus, disagreements over the issue of reparations predetermined the breakdown of the system of quadripartite control [1, p. 286; 3, p. 425–426; 10, p. 205; 11, p. 119; 13, p. 18].

Representatives of *the liberal trend* in Anglo-American historiography note that in the postwar years the USSR had the right to carry out a rigid reparation policy in Germany. Western countries, primarily the United States, could provide financial support to the USSR after World War II and soften the Soviet position on the issue of reparations, but did not do so. In January 1945, the United States refused to grant the USSR a loan of \$ 6 million to restore the Soviet economy. This was of key importance for Soviet-American relations in the post-war period and influenced strongly the policy of the USSR in Germany. In conditions when aid from the Allies did not arrive, it became necessary to take it from the defeated enemy. At that time the USSR could not afford to be magnanimous and generous. The huge losses of the USSR during World War II forced the Soviet side to carry out large-scale seizures of reparations in its zone of occupation. As a result, the agreement on reparations was never reached and the joint control system in Germany collapsed [2, p. 13; 7, p. 595]. The authors note that the evolution of Soviet thinking about the future of Germany did not initially follow a certain trajectory. When the war ended, the USSR did not have a ready answer to the German question. In 1945–1949 years, when carrying out occupation measures in the Soviet zone, economic goals were higher than political ones. From a narrow economic point of view, Soviet reparations are assessed as a great success and an essential component of the internal reconstruction of the USSR [8, p. 10; 9, p. 307].

The third direction in Anglo-American historiography – *rationalistic* – analyzes the problem of reparations as a consequence of the incompatibility of the objective interests of the great powers and the result of the inconsistency of the regulatory framework of the German settlement. The authors note that the agreements of Yalta and Potsdam on the German problem contained a lot of uncertainty. The agreement to treat Germany as a single economic entity and the



agreement on reparations contradicted each other. Consequently, the issue of reparations was originally a dividing factor. Reparation agreements have increased the independence of individual zones and contributed to the economic disintegration of Germany. Not being a single economic entity, it could not be politically united. Each side was right in its own way. The USSR had strong reasons for demanding reparations from Germany, which devastated their country. The West did not understand why it should pay and feed the western zones [4, p. 201; 5, p. 92; 6, p. 121; 12, p. 31].

**Conclusion.** As a result of the study, three main approaches to the analysis of the reparations problem were identified in Anglo-American historiography. Approaches are presented by the “containment school”, rationalistic and liberal historiographical directions.

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## MAYAKOVSKY AND THE REVOLUTIONARY ERA

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The problem of “Person and Society”, social adaptation (upbringing and study) of a person who acts in coincidence with its self-development (self-study, self-training and self-determination) as the subject, in connection to social structures and society as a whole, has always been significant and acquired a multi-purpose theoretical basis [1, 56]. The timeliness of the issue is to identify the person’s lifetime and profession choice in accordance with progressive wishes of mankind together with its problems and goals which are given by the Belarussian Ideology [2, c. 133–134].

The aim of the research work is to understand, to justify the connection (in its specification) of Vladimir Mayakovsky as a personality, a poet to the epoch of social revolution.

**Material and methods.** We used the historical, biographical and poetic material in the research work. Deductive and inductive methods were used as well. Because of ideological and moral problems in modern society we applied the top-down approach (revolutionary epoch, social theory).

**Results and their discussion.** The relationship of the individual and society is demonstrated: choosing life position, its implementation in accordance with the content of the revolutionary era (the previous two centuries) on the example of Vladimir Mayakovsky, with access to historical investigation of the activities of generations of the Soviet period and (briefly) the ensuing theoretical and practical motivations of generation beginning of this century. It is a well-known fact that the Western civilization, starting from Greek policies with their peculiar government mechanism, has been gradually expanding. It came to the state which is called capitalism. Basing their works on economic, historical and other material (mostly on the countries of Western Europe), Karl Marx (1818–1883) and F. Engels (1820–1894), came to the conclusion of unfair – “antagonistic” – mechanism in its social relationships during thousands of years. Besides they specified the clearly unsatisfactory situation among workers of this time [3, p. 24, 32–33, 45]. They considered it was the fault of private property. Its destruction will lead to the transformation of the working class into the leading one, with the transition to the socialism, preserving a degree of economic inequality, and communism (the disappearance of classes and of the state of political relations; “Association of individuals”, “free development of each”) [3, p. 46, 47]. History has shown that after the bourgeois revolution in the struggle for political domination of the capital (in France in 1789, the number of countries in Europe in 1848–1849.; in England the revolution was effected in the seventeenth century) was the revolutionary actions of the workers against the bourgeoisie.

Among them is the Paris Commune of 1871. According to the teachings of V.I. Ulyanov-Lenin (the founder of the Leninist stage in the development of Marxism) Russia should come to the socialist revolution together with the union of the proletariat and the peasantry [4, p. 4, 10, 12, 14]. History proved this prediction. In 1917, after the bourgeois February revolution, due to a range of factors (the main ones are: difficult working conditions at factories; the unresolved land question; the unpopularity of the people of Russia's participation in the First world war; the subjective factor: the preparation of the uprising) Saint Petersburg - on the night of October 25<sup>th</sup> (November 7 BC) there was the Bolshevik revolution that developed into the triumphant March around the new Soviet power through a civil war, in the context of intervention against Soviet Russia. Post-revolutionary events of the country have resonated in revolutionary actions of workers in Western Europe in 1918, Germany, Austria, and Hungary in particular.

The Russian revolution in its consequences was a triumph of the practical realization of the ideas of Marxism-Leninism. The course of world history (the formation of the world socialist system) changed, as well as the way of life of Soviet people in various spheres: political (state of workers and peasants, Soviet power under the leadership of the Bolshevik Communist party), economic (destruction of private property, the introduction of a monopoly nationwide, state ownership), scientific and technical (superiority in space exploration), military (victory in world war II; military parity with the West) and culture (widespread literacy, the conditions for professional and Amateur self-expression).

The revolutionary era gave rise to its fighters, calling for the struggle for the happiness of ordinary people against injustice, hypocrisy, lies and violence, against parasitism at the expense of cruel exploitation of human labor and the capture of technical warfare, colonialism. One of them was Vladimir Vladimirovich Mayakovsky (1893–1930), the great proletarian poet of the revolutionary epoch.

He was a product of the era that put its stamp on a family in which raised, deeply democratic and revolutionary. By his admission [5], in the childhood he was fond of revolutionary songs, political issues, theoretical revolutionary literature, underground poetry, bringing poetry and revolution “together in the head. “In 1905, he participated in revolutionary demonstrations. When he was 15, he joined “the party, the RSDLP (Bolsheviks)”, becoming a propagandist among the workers. He was arrested three times and put into Royal prison for political reasons. Mayakovsky says: “and now I have the right attitude to the world. “This “right” allowed him to have a position of high humanism to express a negative attitude to the imperialist slaughter (World war I) in the poem “War and peace” (1915–1916). He anticipates that the February bourgeois-democratic revolution says their word “socialists”.

Having written “the Ode to revolution” (1918) Mayakovsky accepted social revolution which took place during national, economic and political crisis [5, p. 35], announcing himself as a tribune poet he talked to the youth working audience. Opposing himself as a poet of social-political direction with new ideas he lifted himself to unprecedented heights the harbingers “harbingers” of which were such poets as Mikhail Lermontov (“death of a poet”), Nikolai Nekrasov “the railroad”. Their main poem “Vladimir Ilyich Lenin” (1924), bringing the reader to the cause of social revolution in Russia, Mayakovsky writes: “...and prison was more from factory machines bondage. Pointing to the meaning of the works of Soviet writers in the Preface to the collection “Things this year” (1924), he says: “For us, the masters of a word of Russia Soviets small tasks recede before the broad goals of using word-building commune” [6, vol. 12, p. 63]. For example, in the “camp “NIT Hedge” (1925), dreaming of communism, with his famous lines-ladders aims for 2017:

Нами  
через пропасть  
прямо к коммунизму  
перекинут мост,  
длинною  
– во сто лет

But history did not reached to “commune”, communism, despite the fact that in the early 60s the Soviet Union had the task to build a Communist society already by the eighties. However, by the target date, to save their face, the leaders announced the building of “developed socialism”, and in the second half of the eighties, the new leadership decided to “build” “-socialism with a human face” in the form of “perestroika”, and it ended with the collapse of the economy, country and world system of socialism. The reason for that was not only the fact of “many enemies”, as Mayakovsky said; the social theory of Marxism, CEE radical respect for private property was in need of scientifically and practically-grounded review.

The process of understanding the real historical task for the future is already underway, in which Belarus is at the forefront: at the initiative of the top leadership of the country Belarusian scientists carried out work on the development of the Belarusian state as a human oriented one. The purpose of the movement of modern history should still be determined with respect to the ultimate goal.

According to the concept of I.D. Kulakov, mankind is facing the challenge of the transition to “civil-race (formed from the Latin. civilis – civil and genus – race) society”, where civilized relations between people (regardless of their form of ownership, but wearing civilized nature), States and peoples, based on principles of parity, equal cooperation will prevail [7, p. from counter 355 to 358].

**Conclusion.** The revolutionary epoch caused the stance and content of the work of Vladimir Mayakovsky, who fought against the dark sides of life and for its radical transformation. The lifestyle and work of the writer, artist, musician, a citizen of the country in modern conditions should be directed to the development of civilized relations between people, States and peoples.

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## EFFECTIVENESS INCREASE IN TEACHING FOREIGN LANGUAGES BY MEANS OF COMMUNICATIVE GAMES

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In the Republic of Belarus, the knowledge of foreign languages is recognized as a major factor of social, economic, scientific and cultural advancement. Foreign languages are studied for their further functioning as an instrument of information exchange, interaction of national cultures and universal human values. There is an increasing demand for specialists that can use foreign languages for an efficient provision of different types of communication. In this regard it's particularly important to develop ways and techniques for the quality improvement of teaching foreign languages.

The aim of the research is to investigate the effectiveness increase in teaching foreign languages by means of communicative games.

**Material and methods.** The following research methods were used: literature review on the subject and its critical analysis (works of E.I. Passov, N.D. Galskova, N.I. Gez, E.I. Solovova and et al.), the observation of the



teaching process in Vitebsk gymnasiums № 1 and 2, scientific analysis of English training.

**Results and their discussion.** Games and exercises that are based on the techniques of communicative dialogues allow students to acquire particular speech functions and include different types of cooperation during their implementation (work in pairs, groups, collective engagement that includes all pupils). As a result of our research we have defined that the most effective techniques are the following: matching, combining, guessing games, jigsaw tasks, ranking, problem-solving activities, role play and simulation.

Matching is based on the transmission of information. Every pupil gets one piece of information and should find the missing piece of information from his partner (or partners). For example, a pupil gets an incomplete proverb and should find the pupil, which has the other part of the proverb. Then they can think of a situation or a story which illustrates the proverb, and the rest of pupils are to guess what proverb this is. Pupils move freely in the classroom, talking to different partners, looking for a suitable card or a picture.

Combining includes sorting out certain information, e.g. position in the correct sequence of pictures, paragraphs of the text, making up dialogs from separated lines.

Guessing games are well known in foreign languages teaching. Guessing games are real communicative cases. It should be noted that within the framework of communicative approach pupils are supposed to guess not just words or subjects. Thus in the game “Lie Detector”, pupils work in groups, asking someone in the group questions and trying to guess which answer is wrong.

Jigsaw tasks allow pupils to solve several significant problems in terms of developing speaking skills and communicative interaction. First pupils should understand information they received orally or in a written form and then describe the information to other members of the group. In addition to this, the process of seeking a solution encourages them to use linguistic and speaking means that regulate the interaction.

In the course of ranking exercises, pupils should arrange objects, qualities, information in the order of value or preference, i.e. rank them. After this stage there usually follows a discussion during which pupils explain or defend their choice, work in pairs or groups. Situations, problems and questions which are an excellent framework for these exercises can be borrowed from various contexts. E.g., in the game “Guide” they define which places of London (Edinburgh or Oxford, etc.) they would see first of all, if they had 2 hours of free time.

Problem-solving activities proposed to pupils for cooperative decision can be imaginary and realistic. The latter ones are based on situations that pupils can come across in everyday life. In some cases there is only one true decision but most of the tasks are focused on various discussion methods to solve the problem. The first stage of solving the problematic task suggests presenting various ideas,



at the second stage these ideas are discussed and evaluated. In some cases the teacher can allocate the roles of generators of ideas, critics and experts among the participants of communication. The problem solution can be verbal: developing a plan how to spend a day in London better if you don't have much time and money ("Day in London"), or including making up tables and schedules.

Role play and simulation. Frequently, methodologists do not clearly differentiate between these techniques, while simulation or modelling is more difficult due to its content and procedure because it presupposes the most accurate simulation of reality. Examples of human interaction or social process are simulated during this technique, participants playing roles. Simulation requires providing the participants with information and materials before this activity as well as during its realization. Unlike the simulation role-playing often goes according to the script, which simulates communication.

**Conclusion.** The results of the research allow us to state that the use of communicative games in teaching foreign language communication allows taking into account the age characteristics of pupils and their interests, extends the context of pupils' activities, serves as effective techniques to create a motive in foreign-language communication, contributes to the implementation of the activity approach in the teaching process, provides students with the necessary practice in socially appropriate behavior.

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## **ORGANIZATION OF THE TRAINING PROCESS FOR MASTERS IN ENGLISH LANGUAGE ON THE DEPARTMENT OF ECOLOGY AND NATURE PROTECTION**

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Master's degree is the final academic level in the system of higher education of the Republic of Belarus. Student's education at the graduate (post-bachelor) level is conducted in accordance with the individual academic plan, which is based on the curriculum of a correspondent graduate school major. It is aimed at active independent work of students and includes a list of studied disciplines and the volume of the training load, the thesis preparation program, lab and research work. It also teaches style and proper reporting for each of the specific sections of the plan. Citizens of other countries are trained in the magistracy in accordance with the bilateral agreements [1].

In the 2010–2011 academic year, there were 342 international graduate students in Belarus. Most of them were Chinese, Iraqi, Iranian and Russian nationals. Of the 15 thousand 126 international students studying in Belarus in the 2016/2017 academic year 7911 were representatives of Turkmenistan. In the second place among foreign students there were students from Russia (1594 people or 10,5% of the total number of foreign students studying in Belarus). The third place is occupied with the students from Iran with 793 guests from the Islamic Republic. They comprise 5,2% of the total number of international students. According to the “Bulletin of Statistics: Education in the Republic of Belaru [2], the number of international students, in percentage terms, has been constantly increasing from 2010 to 2017 to the total number of Belarusian students enrolled in our universities. So, in the 2010/2011 academic year, this indicator was 2,1%, and in 2016/2017 already 4,8%.

Thus, it is possible to note an increase in the share of foreign citizens studying at Belarusian universities in the first and second stages of higher education. It should be noted the positive economic effect from the export of educational services, which sets new tasks for attracting foreign citizens to the Republic of Belarus, opening specialties in a foreign language. The purpose of this work: analysis of the organization and conduct of the educational process of the second stage of higher education in English at the Department of Ecology and Conservation of the Voronezh State University named after P.M. Masherov.

**Material and methods.** In the course of our work, the analysis and generalization of the work of the Department of Ecology and Nature Conservation at the Vitebsk State University named after P.M. Masherov on the organization of educational process for undergraduates in English by specialty 1-33 80 01 "Biology". The comparative-comparative method, methods of generalization and analysis of the organization of academic work with foreign undergraduates are used.

**Results and its discussion.** Since 2016, at the Department of Ecology and Conservation of the Vitebsk State University named after P.M. Masherov developed a curriculum, training programs and organized training in specialty 1 33 80 01 "Biology" for foreign citizens. Master's training is conducted in full-time and is two years of study. The curriculum includes general educational and special disciplines (see table).

Table – Disciplines of the curriculum

Title of discipline	Distribution by semesters	Form of final control
The cycle of special disciplines, the state component		
Modern Problems of Biology	4 semester	exam
A cycle of special education disciplines, a component of an educational institution		
Plant cells and plant tissues biology with elements ecological anatomy	1 semester	credit
Biology of individual development	1 semester	credit

Human Anatomy and Physiology	1,2 semester	credit, exam
Bioecological features of key invertebrate animal groups	1,2 semester	credit, exam
Microbiology	1 semester	credit
Principles of modern genetics	1 semester	credit
Vegetative plant organs and plants respond to ecological factors	2 semester	exam
General ecology	2 semester	exam
Applied ecology	3, 4 semester	credit, exam
Modern evolution theory	3 semester	credit
Biology and comparative anatomy of vertebrate animals	3 semester	exam
Bioindication	3, 4 semester	credit, exam
Ecological monitoring	3 semester	exam
Reproductive morphology	3 semester	exam
Methods and techniques of scientific research	4 semester	credit
Biodiversity	4 semester	credit

The curricula of the courses are designed taking into account the teaching of the modular system. During the training, undergraduates go through practice. The final attestation is carried out in the form of defense of the master's thesis, a master's degree is awarded and a state diploma is issued. The master's thesis is a qualification work containing a totality of results and scientific research, put forward by the author for public protection, having an internal unity, evidencing the personal contribution and abilities of the author to conduct independent scientific research using theoretical knowledge and practical skills.

Modular training system involves the breakdown of the training material into modules with mandatory control over the passage of each module. Methodological material for the disciplines includes: the development of lecture materials and the preparation of presentations; assignments to laboratory and practical occupations taking into account the individual characteristics of students. So, for example, in the 2016–2017 school years, the Master's program at the Department of Ecology and Conservation was held for citizens from the African Republic of Ghana. In the material under consideration for individual disciplines, emphasis is placed on comparative analysis of data in the Republic of Belarus and Ghana. In such disciplines as "Environmental monitoring, control and examination", "Biodiversity".

Modular course system allows you to organize the material, create a clear structure of the course. Important points in the use of the Moodle system in preparing foreign citizens are the individual approach and the ability to adapt content to the needs of the listener, the visibility and flexibility of providing information; a cumulative principle of assessing the work of the undergraduate, the possibility of self-monitoring and self-esteem.

**Conclusion.** When organizing the educational process of the second stage of education in a foreign language for the citizens of the far abroad on the specialty 1-33 80 01 "Biology" it is necessary to pay attention to the

following main provisions: development of the curriculum and selection of disciplines of specialization, taking into account the individual needs of students; highlighting topics highlighting the issues of biology and ecology in the Republic of Belarus, the world's leading countries and countries of undergraduates; the use of a modular system in the development of training programs and the Moodle system for the placement of educational materials.

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## **THE USE OF THE YOUTUBE SOCIAL SERVICE IN FOREIGN LANGUAGES TEACHING**

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The main aim of foreign languages teaching today is a formation of communicative competence which includes the following constituents: linguistic, sociolinguistic, socio-cultural, strategic, discursive and social aspects. In this respect it should be stated that information technologies application in studying foreign languages assumes a great prominence and its didactical possibilities give the opportunity to get distance education sing resources of different regions and countries. The platform of social services Web 2.0 is of special interest today. It makes possible for general public users of the Internet to be not only recipients, but its creators and co-authors, what is more important. Its main types are blogs, Wiki pages, podcasts, photo service Flickr, YouTube [1].

The aim of our research is to investigate the possibilities of the YouTube social service in foreign languages teaching.

**Material and methods.** The following research methods were used: literature review on the subject and its critical analysis (works of E.I. Passov, M.N. Evstigneev, E.S. Polat, P.V. Sysoyev and et al.), the observation of the teaching process in Vitebsk gymnasiums № 1, № 2, the analyses of the attended lessons.

**Results and their discussion.** YouTube is a social service of information publication and its storage (hosting). There are professionally made films and videos on the website as well as amateur videos which include video blogs. Video materials of the website contain not only the information in a foreign language, but the information about the language itself. What is more important is that they also contain cross-cultural information. As a result of our research we have defined that educational

possibilities of audio-visual presentation of cross-cultural information surpasses the possibilities of the presentation of the same information in contemporary paper textbooks. Students can see sights of target languages countries, life fragments of native speakers, listen to authentic speech. It is necessary to conduct discussions on the subject of reviewed videos for communicative skills development. Moreover, students can read and leave comments on videos themselves. Thus they can take part in writing communication in target languages not only with native speakers, but with people from the whole world who also use this language for communication. In such a way this kind of work can foster reading and writing skills development.

The information of the YouTube service is made for native speakers and for studying foreign languages. Due to our research results we can state that this kind of information can be used for lexical language aspect teaching (e.g. idioms and so on). Among channels, which create educational videos, there are such channels as Real English, Mister Duncan, Jennifer ESL and others. Moreover, there are YouTube/Edu channels that belong to various universities of the USA and Great Britain, such as Oxford or Yale Universities. They publish videos of different lecture courses. With the help of the information of these channels and its content students can enrich their knowledge of foreign languages for getting information on different subjects.

The results of our experimental work show that YouTube service can be used for studying foreign languages both in the classroom and in students' extra-curricular activities. The following teaching techniques can be recommended at lessons:

1. Work in teams with the same video. In this particular case work stages do not differ from traditional work with video fragment:

- pre-demonstrative stage, where all language difficulties are dismissed and the orientation to review is given;
- demonstrative stage, where overall and detail comprehension exercises are done;
- post-demonstrative stage, where speech development exercises are practiced and discussions on the subject of the observed information are held.

2. Work in teams or individual work with various video fragments on the same subject (e.g., «George Washington's biography»). After seeing the fragments students share the obtained video information. Just the information gap creates students' communicative impetus and their motivation to communicate in a foreign language. This kind of work presupposes a great degree of individualization, however the value of control on the teacher's side is not decreased.

As it is rather problematic today to use the high-speed Internet at lessons both in schools and universities, it is reasonable to use YouTube for individual home work. A teacher gives reference links for certain YouTube videos on a topic, works out exercises which students are to do when



watching the videos. Then the analysis of the exercises is made at the lesson and the observed video is discussed. Both during the video lesson and at home students can work with the same video or with different ones.

We think that special attention should be given to teaching students to work with YouTube service itself, its structure, peculiarities of the server search. For example, the search can be realized with the help of keywords. When a user opens the necessary video from the list of the found videos, there is an additional list of videos on the right side similar to the opened one. As a rule just in this list interesting videos can be found. It is also possible to search for videos by means of topics and channels. The main task of the teacher is to seek and select videos and channels which can appear to be useful for lessons and interesting for students. A teacher can create a blog where he will publish helpful reference links to videos together with his students.

**Conclusion.** Thus the usage of YouTube social service in teaching foreign languages is an effective way of skills development of listening comprehension, speaking, reading and writing. The server contains a huge amount of videos and their right selection gives great opportunities to the teacher to use them in educational aims, which helps to increase students' motivation in studying foreign languages and form their communicative abilities.

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## **LOGICAL SEMANTIC MODEL (LSM) AS A WAY OF THE EFFECTIVE MONOLOGUE TEACHING OF NON-LINGUISTIC SPECIALTIES STUDENTS**

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Foreign language monologue teaching is getting more important at the present stage of higher education development. The integration in the field of science and technology and the increase of international collaboration make demands on the foreign language skills of specialists of different domains of knowledge, according to which foreign language teaching is starting to have more professional purpose and aims at mastering all the communication methods used in scientific and professional spheres. As a rule, these methods include presentations, reports, performances at conference etc. Consequently, the monologue teaching of non-linguistic specialties students and especially



the development of their presentation skills are getting more relevant, as it teaches them to think logically and express their ideas, so that everyone could understand them. Thus, the urgency of the research is determined by the necessity to introduce into learning process modern teaching techniques, which lead to the improvement of the quality of foreign language education in higher educational establishments in general and of the methods of teaching speech in particular.

The aim of the research is to determine better ways of using visual aids at English classes for foreign language monologue development.

**Material and methods.** When writing the article we used the following research methods: the study of the literature on this topic and its critical analysis (the works of E.I. Passov, G.V. Rogova, M.V. Lyahovicky, A.A. Leont'ev, N.I. Gez and others), the observation of the learning process at the University named after P. M. Masherov, experimental testing of system tasks dealing with monologue teaching based on verbal and visual aids at the Art Department of Vitebsk State University named after P.M. Masherov.

**Results and their discussion.** Visual aids, LSM (logical semantic model) in particular, can be used to manage the independent work of students in a foreign language. The LSM includes two components: semantic and logical. The semantic component is presented in the form of keywords on the topic of the lesson. And the logical component organizes these concepts into a semantically connected system and supports analysis and synthesis operations. The advantage of the LSM is that students are given the opportunity to use all types of speech. By means of the LSM the learner-centered approach is implemented and the basic principle of this approach is followed, i.e. there is a student and his learning activity in the centre of education. The LSM stimulates group work. The work in different regimes (in groups, in pairs) allows to adapt communicative situations, to use conversational clichés, to reason and to compare. Due to such visual aids as LSMs the participants of the situation, having a different level of language proficiency, become equally competent to carry out a certain task.

In this case the role of the teacher is just to manage the learning process and create all possible conditions for the active independent work, i.e. to provide motivation and desire to speak in a foreign language. The LSM can be made up for grammar teaching as well, because grammar is considered to be the most difficult when learning a foreign language.

This presentation of the material affects various aspects of productive thinking, i.e. a) thinking acquires system features due to the programmed information process directly during the primary perception; b) memory mechanisms are maintained and information control is improved due to the visual representation of knowledge in a natural language in a reduced form; c) intuitive thinking works much better; d) the capacity for reducing and expanding information improves; e) interhemispheric 'dialogue' improves, because the features of the body of interest are determined/specified by the

left brain, and the right brain accumulates external experience and helps the left one to compare the signs and operate them [1, p. 238].

The LSM can be presented to students in three ways. Firstly, it can be given in a ready-made form when explaining new material. Secondly, it can be made up with students when studying new material. Thirdly, students can make up the LSM on the given topic independently and then offer others for work. It's quite an entertaining process, because it develops student creativity, gives them the opportunity to show themselves at their best and also contributes to the development of students' independence and their responsibility to other students for the offered models.

**Conclusion.** The advantage of the LSM is that it gives the opportunity to present not only the whole topic, but also its every component separately. It allows to show the main problem and the ways for its solution. When using the LSM, the quality of material memorization improves and the tension which is related to the fear of students to miss important elements decreases. Mastering it, students are involved into the creative process of modeling and constructing of their own knowledge. The use of the LSM at foreign language classes allows to solve the following problems: 1) it performs the function of an information organizer, connects separate issues into groups and helps logically to make up a monologue; 2) it promotes a better understanding of information, because it contains the necessary lexical and grammatical material on the studied topic; 3) the use of this model allows students to be involved into active cognitive activity, during which knowledge is mastered at a higher level; 4) it strengthens the interest in learning a foreign language and increases the creative character of learning activity, especially when students work independently.

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## **WAYS OF PREVENTING COMMON PRONUNCIATION MISTAKES OF ENGLISH LEARNING STUDENTS**

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Modern language teaching aims at forming communicative competence which includes development of speech and language skills. Among the key language skills are phonetic ones as it is impossible to turn thoughts into speech without them. That's why it is important to form proper pronunciation skills to foster communicative competence and avoid misunderstanding.

The aim of the article is to examine the problem of common pronunciation mistakes and to determine ways to prevent them.

**Material and methods.** The study was conducted at VSU named after P. M. Masherov, with the participation of first-year students of the philological faculty. In work was used a diagnostic test in practical phonetics. We used observation method, descriptive method.

**Results and their discussion.** All the pronunciation mistakes made by learners of English can be divided into phonetic and phonological ones [2, p. 12].

Phonological mistakes affect the meaning: *beat* [bi:t]- *bit* [bit], *bed* [bed]- *bad* [bæd].

Phonetic mistakes do not change the meaning but the quality of sounds is modified. Mistakes can be qualified as phonetic when an English sound is completely or partially substituted by a familiar sound of the learner's native language.

The most common pronunciation mistakes made by learners of English concerning vowels are as follows:

– absence of differentiation between open and closed vowels [æ - e], [ɑ: - ʌ] which results in phonological mistakes [ *bæg* – *beg* ];

– weak differentiation of front and back vowels [i: - i], [e - ɜ:] leading to phonological mistakes [ *bɜ:d* – *bed* ];

– ignorance of vowel length resulting in phonological mistakes such as [ *fu:l* – *ful* ];

– strong labialization of the vowels [ɔ - ɔ:], [u – u:]. This mistake is a phonetic one as only the quality of the sound is affected;

– reduction of unstressed vowels, for example, [ *kʌn'tʌkt* ] instead of [ *kɒn'tʌkt* ];

– wrong word stress when two parts of speech are differentiated [ *'ɔbʃɪkt* - *əb'ʃɪkt* ].

The following mistakes are made when pronouncing consonants:

– weak differentiation of the sounds [w - v] which results in phonological mistakes [ *wel* – *vel* ];

– replacement of the English postalveolar sound [r] by the Russian alveolar variant but this mistake doesn't affect the meaning;

– absence of differentiation between the sounds [ŋ - n] resulting in phonological mistakes such as [ *θiŋ* – *θin* ];

– weak differentiation of the sounds [θ – s], [ð - z] which is determined by absence of interdental sounds in the Russian language;

– devoicing of the voiced consonants affecting the meaning because of the influence of the mother tongue;

– loss of aspiration of the plosive consonants [p,t,k] as a result of weak breath effort;

– palatalization occurs since some alveolar consonants such as [t,d,s,z,l,n] are replaced by the Russian dental sounds. One should remember that in English there are two allophones of the sonorant [l] – ‘dark’ and ‘clear’.

There are two key sides to pronunciation teaching – the teaching of productive and receptive skills. In terms of reception students need to learn to hear the difference between phonemes. Then they need to carry that knowledge through into their production.

The first step to prevent pronunciation mistakes is exercises on developing deep breath in order to prepare articulating organs of speech for producing proper sounds. Moreover, there should be added exercises for the opening of the mouth, for the lips and the tongue.

There should be a clear description of the sound and position of articulating organs before practicing it. All phonetic phenomena should be explained thoroughly. It should be taken into account that all sounds of a second language are divided into three categories as compared with the mother tongue: 1) those that correspond with sounds in the native language; 2) sounds close to the ones in the native language; 3) sounds that are not represented in the native language.

Ear training exercises play great role in forming good pronunciation skills. All sounds are repeated after the speaker individually and by the whole group. Drilling is a crucial part of classroom pronunciation work. New sounds are constantly drilled in an isolated position, in a syllable and a word, then in a sentence.

**Conclusion.** Learning a foreign language is always a complex and challenging process. It requires acquisition of numerous skills and elements including phonetic system. Since phonetic systems of various languages differ greatly, achieving correct pronunciation in one’s second language always poses serious difficulties for learners. Non-native speakers come across various difficulties in learning English pronunciation: tense and lax vowels, consonant positions, consonant clusters. So pronunciation needs constant attention for it to have a long-lasting and beneficial effect on students. It means integrating into daily classroom activities exercises aimed at forming and maintaining proper pronunciation skills.

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## HISTORY, THEORY, PRACTICE AND METHODOLOGY OF VISUAL ARTS TEACHING

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### EKOLOGICAL EDUCATION OF PRE-SCHOOL CHILDREN IN THE PROCESS OF AESTHETIC PERCEPTION OF NATURE

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Nowadays the mankind has serious ecological problems: air pollution by toxic emissions, destruction of the ozone layer, depletion of minerals resources, deforestation, problems of the World Ocean, etc. Ecologically directed education of pre-school children by means of graphic activity cultivates careful attitude towards nature, teaches to notice, understand and appreciate beauty in the environment.

The purpose of this article is to identify the opportunities of aesthetic diversity of nature during art classes in ecological education of pre-school children.

**Material and methods.** Art classes have become the material of the research. The relation to nature of middle group of pre-school educational establishment "Day nursery gardens" No. 110 of Vitebsk was considered. The following methods were used: pedagogical observation, analysis of results of children's creative work.

**Results and their discussion.** In current ecological situation the establishments of education have to pay special attention not only to the development of beauty perception, but also the ability to find natural source of necessary benefits and resources which need careful attitude and protection. Practice shows that the fundamental role in this process belongs to familiarizing of children with ecological and esthetic values as the same principle of harmony disclosed by them in the different ways is the cornerstone of ecology. " Art classes", Fedkov G.S. writes, "develop children's emotional and sensual sphere and create an original basis for understanding moral values considered in the context of the good and the bad, verity and falsity, beauty and ugliness, fair and unfair" [1, page 29].

Pre-school children need preliminary preparation to percept aesthetic variety of nature. For this purpose a teacher can use conversations about nature as a kind of art activity, an associative array, the comparison of the general and the specific, what is well known to children. Let's examine classes on the topic "Autumn Leaves Carpet " (classes of this sort can be given in any time of the year, for example, in the winter it can be occupation on the subject "Birds Feeder", in the summer "The Belarusian reservoirs"). Educational problems of this art class are focused on the development in pre-

school children the ability to see beauty of the autumn nature, skills development in making harmonious color combinations, organizing the environment aesthetically. The result of this work is autumn leaves carpets made by children.

The class begins with the conversation devoted to nature in autumn. We draw children's attention to the variety of colors and natural forms, beauty of autumn and autumn leaves, how trees and the sky have changed, to the reddened mountain ash clusters – food for birds in autumn and winter. The teacher can offer pictures corresponding to the topic of the lesson. While examining them there is the opportunity to answer the questions, whether you like autumn or not and why, what color are autumn leaves, how many color hues can be distinguished on a leaf, how can we take care of nature? To conclude, it is important to emphasize the benefits that are brought by nature and the benefits we can bring to it.

Further the explanation how to create “an autumn leaves carpet” takes place. At the beginning we offer children different ways of “an autumn leaves carpet” creation, then they choose leaves of various forms and create “the carpet”.

**Conclusion.** Thus, ecological education in the context of art activity includes aesthetic perception of nature, practical art activity, development of moral and cultural values. During art classes children learn to notice and appreciate beauty in the world around us, and take care of nature.

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**THE GAME OF CHIAROSCURO IN THE WORKS  
OF BELARUSIAN ARTISTS OF THE XX – EARLY XXI CENTURIES  
ON THE THEME OF YULE AND AUGURY**

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The themes of Yule and augury are rather blessed, because human are experienced emotions at the same time. He was drawn always to the everything mysterious, he wanted to open the veil of the future. The theme of magic, witchcraft, augury are become especially attractive. It allows to go beyond the ordinary for artists. For the games of lighting should be understand, as one of the techniques in transmission of a specific theme in the painting with the help of a lit candle at night.



The purpose of the article is to research the paintings of Belarusian artists and trying to find painting made with the help of methods of lighting, namely the lit candle at night.

**Material and methods.** The material was used by various literature in the history of the fine arts of Belarus, magazines such as "Mastatstva" of different years, Internet-portals related to the arts of the 20th century and the beginning of the XXI st. century in Belarus. Deductive and inductive methods were used in the processing and interpretation of the material; also methods of analysis and synthesis of literature and illustrative materials.

**Results and their discussion.** The sacred life of different nations traced throughout the existence of arts, beginning with primitive times. It was displayed in different forms and types of arts. The sacral included scenes of magical rituals, rite, conducted by ancient civilizations. Such rituals as of a pagan nature can already be found in the rock painting of primitive people. For example, they displayed the hunting scene was already a ritual of successful hunting. In ancient Egypt, scenes of magic associated with priests and pharaohs, that were displayed in the wall iconography inscriptions in the sanctuaries of the pyramids or temples dedicated to their Gods. Ancient Greece adhered to the same display of magic, and the temple - a place where only priests, soothsayers, and oracles could penetrate. In ancient Rome in one of the rooms, the Villa of the Mysteries in Pompeii was preserved with very interesting, artistically significant frescos. The composition unfolded on the walls represents scenes of the sacraments associated with the cult of Dionysus.

With the development of oil painting and various genres of paintings, the theme of augury has found its place at the present stage of the development of arts.

The works of any Slavic people have themes that affect their culture, customs, rituals, holidays. Yule holidays are relevant to this category. The festivals and fortune-telling were in the traditions of our country. Adults and children carouse go to guests; people are guessing at the future, for example, girls guest for the future elect. All of them displayed mainly in decorative and applied art, but also in picturesque plans and graphics.

In the works of modern artists of the XXI century, such as A. Isoeitko, S. Timokhov, can be trace the tendency to create thematic compositions on the theme of Yule and augury, but they are negligible. With the help of analyzing, huge number of illustrative material, paintings created by native artists pay attention to the fact, that the exhibit of similar themes is rarely encountered with the game of lighting. In this regard, the number of such works of art is meager in quantity. Masters of Belarusian painting rarely addressed specifically to the topic of augury displaying with a candle in pitch darkness. This creates an unprecedented range of opportunities and new ideas for the master. The light is extremely attractive and tempting, and the research of color combinations, relationships, the definition of the general

tone and other with the task of such light, conjure up the idea of the novelty and freshness of the solution.

It should be said that the thinking of our native artists is embodied by means not only of realistic painting, but also of formal arts. Themes are transmitted through the color spots, shapes, signs, symbols. Artists trying to convey the action as a collection of images of people, the magical light of a candle or other objects.

The task of reviewing and identifying artistic works on the themes of Yule and augury can be justified objectively. The lit candle is one of the sources of the riddle, mystery and at the same time tension at night. One of the most difficult tasks – to paint at night the lit of the candle, the transfer of a special atmosphere of mystery, magic in the picture. Turning to the history of art, you can pay attention to the period when the artist began to experiment with light in his works. By this time, Western European Baroque is considered; in the style, in the ideology laid dynamism, riot and heat.

Also the attention was paid to the phenomena of the counter-shade. In the time of Baroque as a style, one of the achievements was the discovery of the expressiveness of the counter-shade, he created a special dramatic mood. It is also a more successful device for conveying an emotional attitude towards the struggle between good and evil. It is best to observe it when the only light source is behind the object. And such a struggle between "good and evil" just finds its place in the theme of paintings on the themes of Christmas and fortune-telling.

**Conclusion.** When analyzing a large number of illustrative material, when summarizing the literary heritage, it can be said that the theme of augury and the theme of Yule in works of Belarusian artists are few reflected in the work of painters. Also was revealed, that the rarity of the use of the game of light and shade on the art canvas is obvious.

## **SIGN-METAPHORICAL TRENDS OF NATURE IN THE BELARUSIAN PAINTING OF THE 1990s**

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In the Belarusian painting of the late XX century the importance of metaphor and symbols is great. Some believe that the visual image can not be considered metaphorical if it does not have the fusion of two different areas of experience, forming a new, spatially limited being. It turns out that the metaphor is formed by replacing the expected visual elements with unexpected ones. Modern Belarusian painting has a deep sign-metaphorical component in revealing the image of nature.

The purpose of the study was to identify the features of the artists' creativity of the symbolic-symbolic trend of the Modern Belarusian landscape painting.

**Material and methods.** The material was the art works of Belarusian artists (in the period 1990–2000 s.). In the work on the article, the following research methods were used: an art critic, a descriptive-analytical method, a comparative method.

**Results and their discussion.** There is such a thing as "Fine metaphor" and it will say deeply different from the verbal metaphor: "It does not generate new meanings or new semantic nuances, it does not go beyond its context and does not stabilize in the language of painting, it has no prospects for life beyond that work of art into which it enters.

By the mechanism of creation of the pictorial metaphor there are also sharp differences from the mechanism of the verbal metaphor, the indispensable condition of which is the belonging to different categories of its two subjects (denotates) – the main one (the one that is characterized by the metaphor) and the auxiliary one (the one that is implied by its direct meaning). Fine metaphor is devoid of two-subjectness. It is nothing more than an image that acquires a symbolic (key) significance in a particular artistic context, a broader, generalizing meaning. The metaphor in painting is the source of vivid ideas, it creates the imagery of the work.

Metaphor in painting can be created by changing the color, shape and function of the object. A characteristic example is the curved Dali watch, the flying figure of Chagall, the Kadishman's sheep. They are painted by the artist in all colors of the rainbow, which is not entirely true. So the Webster dictionary contains such an interpretation of the concept of "metaphor": the qualities attached to objects or events, as a rule, they are not peculiar.

Modern Belarusian painting is not conceived without certain metaphors and signs, as they reveal the deep essence of the work. In the Belarusian easel painting in the 1990s, the way out of the circle of traditional themes and plots, active evolution of the plastic interpretation of the image is quite clearly and consistently traced. This became noticeable on the background of a decrease in interest in the genre of the thematic picture (in its traditional sense). Already in the early 1990 s, the associative form of figurative interpretation became the main one in the creative practice of Belarusian painters. In the works, the perspective construction is increasingly absent, the plastic language of painting is becoming more complicated, the metaphorical and symbolic convention is growing, the appearance of sign forms is observed. There is a departure from the habitual realism of the image, the desire to express the deep, secret meaning of people and things by non-traditional means is growing. Painting loses social pathos, the authors began to look for sources.

Most Belarusian artists turn to the signs and symbols of national culture in their work while displaying the beauty of their native land. This is present in the works of E. Batalonka, V. Kozhukh, B. Kazakov, V. Markovets, G. Skripchenko, V. Udnich, V. Shkarubo, F. Yanushkevich and many others. Thus, "referring to the easel painting as a set of genres, the painters create a concrete, but simultaneously generalized image of nature, imbued with a deep lyric-poetic feeling" [5, p. 94].

For the creative work of V. Markovets, the synthesis of a realistic manner of performance with a certain romanticization of images and plots is characteristic. The technique of oil painting has a range from almost watercolor transparency, from pastel and even texture combinations of colors in realistic creativity to a balanced plane painting and simple linearity of the picture in conceptual compositions. In them the symbols of water (river, lake) and earth prevail. He created a series of paintings dedicated to the village of Vaishkuny such as "Bright Day" (1990), "The last inhabitant of the village Vaishkuny S. Kibitsky" (1991), "Lyntupka River", "Lake Balduchitsa", "Village" (all 1997).

G. Skripchenko is building his own real and at the same time theatrical and illusory world. The author enables the viewer to feel the feelings associated with deep attachment to the native land with the help of the symbols of the earth, the tree. This is characteristic of such paintings as "The Lovely Corner" (1994), "At Home" (1996).

In the painting "Po mushrooms" (1990) against the background of the usual rural landscape, the author places an iron monster with a bird's head. His body is made up of a heap of unidentified objects, details and forms. Everything foretells trouble. It is possible that the large friable mushroom compressed in the manipulator and stretched out by the monster is the last gift of the forest. The things reflected by the artist are symbols of human life. Good and evil, beautiful and terrible – all these categories attract and impress the artist. In his works the painter tries to comprehend not specific problems, but to co-organize associations born by them [5, p. 98].

V. Shkaruba landscapes have a traditional interpretation – a view with trees and houses, fast clouds and stagnant puddles. But these species miraculously coincide with the understanding of modernity and the universe. Great importance for the understanding of works has the form of natural open spaces (late spring or summer).

Dynamics in the works of V. Shkaruba does not arise from the plot changes in the compositions. Movement occurs because of the relationship between the dark and light, as in the works "Beginning" and "White Twilight". Comparison of the dark and light in the picture becomes the main, and therefore acquires a philosophical sound, without being attached to a specific motive.

**Conclusion.** In the Belarusian painting of the XXI century an important place is occupied by signs and symbols, as one of the main trends is the confirmation of the metaphor and concept that replaced the thematic component. Artists are increasingly interested in the facts of reality to a lesser extent, and more in their own associative perception. The master turns to the inner meaning of being, expressing his feelings through the reflection of the symbols of the earth, water, bird, world tree, through appeal to mythology and ancient archetypes.

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## **THE ROLE OF VIDEOADVERTISING IN CAREER GUIDANCE ACTIVITY**

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Educational services are considered in modern society as a product that needs effective promotion. Advertising plays an important role in this process. The need to promote their services in the market in a competitive environment encourages universities to seek and apply more effective ways of transferring information. The study of educational advertising and its perception by consumers will facilitate the choice of this way of presenting information to the audience. In addition, the study of this issue will make it possible to conduct advertising campaigns of the university more effectively.

The purpose of the work is to study the main activities for creating an animated career-oriented video for the art-graphic faculty of the Vitebsk State P.M. Masherov University.

**Material and methods.** In this article, electronic resources and personal experience of the researcher in the field of advertising production were used. As methods of research, the system-structural analysis and the method of comparative - competitive analysis of advertising products in the field of education were used.



**Results and their discussion.** In the modern world, a person receives a huge amount of information every day. It is becoming more and more difficult to absorb it qualitatively. Most people get information with the help of vision, so the problem of high-quality transmission of visual information is relevant for many areas of human activity, including for science and education.

In order for a person to quickly and efficiently assimilate information, it must be presented in an understandable, convenient for perception and memorization form. This can help visualize information. Graphic way of information, data and knowledge transfer is infographics.

Video advertising is an effective way to promote educational services. Information support in carrying out activities for career guidance on television, radio, via the Internet is the most important component. Social advertising is a powerful ideological tool for the implementation of state orders for professional staff.

For the promotion of universities most often used are types of traditional advertising, such as print advertising (placement of modular and text advertising in the media, advertising printing); outdoor advertising (advertising on the facades of buildings, advertising on transport, posters); sound advertisement (video).

Within the framework of our research, we can distinguish the following functions of advertising educational services:

- Information function helps to inform the public about the range of available educational services and how to obtain them.
- Value-orientation function promotes the creation of patterns that need to be followed if you want to receive higher education; the formation of choice, the recognition of universities and educational services that they offer.
- Communicative function leads to increased awareness of the institution; increase of recognizability, memorability of the university; formation of a positive attitude towards the university; desire to enter the university [1].

It should be noted that for success, advertising should be not only educational in nature, but also prompt to action.

The effectiveness of the advertising activities of educational institutions depends not only on the advertising itself, but also on a number of both controlled and uncontrolled factors, such as the economic situation in the region, the time of year, prices for educational services, the prestige of the institution, its location, and the qualifications of the teachers. It should also be taken into account that the effect of advertising can not come at once and be stretched in time [2].

Depending on the purposes of the advertising campaign, various indicators may serve as criteria for its effectiveness. As part of our study, we have identified commercial and communicative.



In the first case, the effectiveness indicators of the advertising campaign are the increase in the number of entrants, increase of prestige in the market of educational services.

Communicative indicators include increasing the recognition of the university, level of awareness of its units, loyalty of specific target groups [3].

For the role of measurable indicators of the effectiveness of advertising three values are suitable: the level of interest of the target audience to the offer of the university, the level of need for advertised services, desire to enter this university.

To develop an animated career-oriented video for the art-graphic faculty of the Vitebsk State P.M. Masherov University we defined the following conditions:

- creating a video in the form of sound advertising, as the most effective and affordable type of advertising;
- advertising video should be characterized by bright visual images, continuous change of sounds and colors;
- the transfer of information in the advertising video is presented in the form of infographics, as one of the forms of fast and accurate submission of complex information;
- the information in the video must be presented in an understandable, convenient for perception and memorization form;
- an advertising video should form a positive attitude and raise the recognizability of the art-graphic faculty of the Vitebsk State P.M. Masherov University, cause the desire of applicants to enter this university.

**Conclusion.** In the modern world, the role of video advertising is growing. Animation and videos in the style of infographics have become more popular. Thus, you can attract the attention of the viewer with the dynamics of what is happening, bright visual images, continuous change of sounds and colors. The target audience will again and again view the favorite frames. Namely, this is what is needed to successfully attract the attention of the subject of career guidance.

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**MODERN MODEL OF THE DESIGN OF THE SUBJECT ENVIRONMENT, TAKING INTO ACCOUNT THE INTERACTION OF MAN WITH THE OUTSIDE WORLD**

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One of the main functions of design initially is the adoption of the object environment for man. This allows us to talk about the need to take into account the design of all human needs: from ergonomic to spiritual-psychological. However, it is not easy to do this because the designer is also deformed to some extent by the environment in which it exists, reality affects him, sets subjective assessments and stereotypes, thereby leading away from really pressing design tasks [1, p. 12].

The existing design tools are quite diverse, many methods have been developed. Their effective use will strengthen the availability of a flexible framework that links all the design stages with the person for whom the design product is intended. Such a foundation has already been formed, but not always reflected by designers.

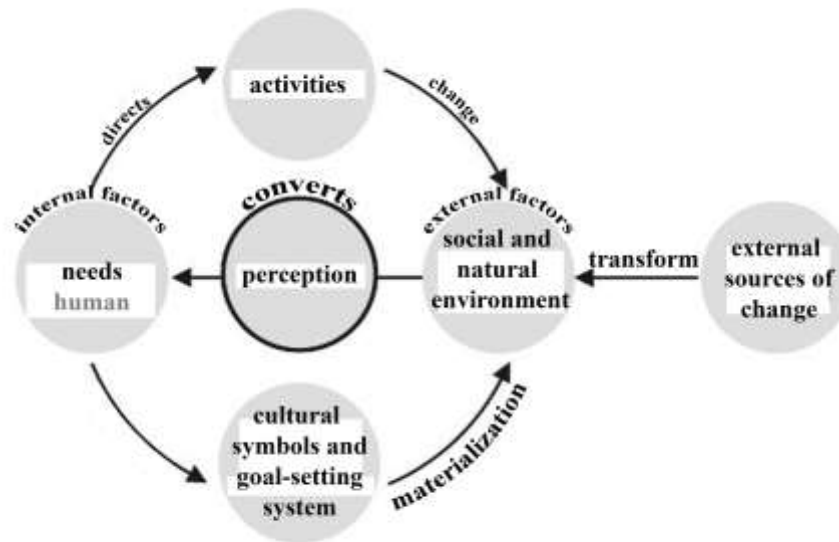
Thus, the purpose of our research was the development of a model for the design of the subject environment, taking into account modern conditions, methods and design tools.

**Material and methods.** In the work on the topic, analytical and systemic methods were used. The analytical method aims to describe the structural elements of design design, and to find out the reasons that lie at its basis and determine the nature, prevalence, severity and other characteristics inherent in it. The system method allows to consider the design and consumption of design products as interrelated elements of a unified system, the basis of which is the interaction of a person with the objective world.

**Results and their discussion.** Insufficient representation about a person, his preferences, at the level of design methods, in modern theory and practice of design-design leads to formalization and lack of individuality and functionality of projects.

The origins of the conflict between a person and the objective world are associated with a holistic perception of this world, on the one hand, and the differential impact on it, on the other. This allowed us to identify the areas of conflict between the person and the objective world in design, which are the result of insufficient consideration of design conditions, as well as the dynamics of changes in the surrounding world and people during design.

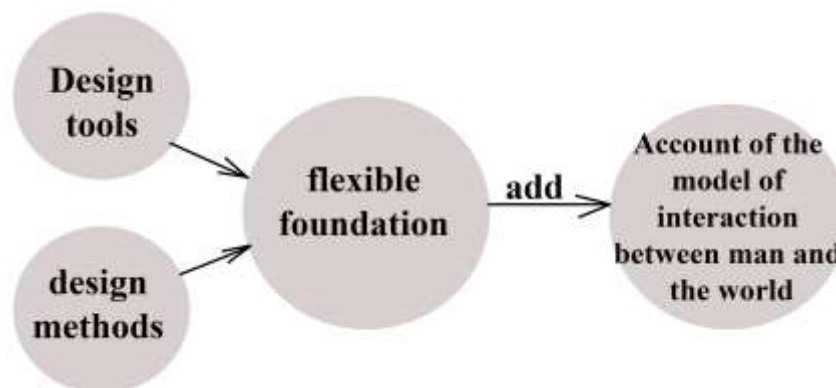
In the course of the study, we developed a model that systematizes interactions between man and the world (pic. 1).



Pic. 1 – Model of interaction between man and the world

Read this model follows: a person organizes his activities in accordance with the needs. Activities, in turn, lead to changes in the social, then the natural environment, then both at once. The change in the environment then affects the perception of reality and, accordingly, leads to a change in needs, etc. The system is not self-contained. It is open to external influences, which involves changing the environment and thus the whole system as a whole.

Taking into account the above, we have developed a model that allows the developer of the object environment to implement a harmonious and holistic project (pic. 2).



Pic. 2 – Model of the design of the subject environment, taking into account modern conditions, methods and design tools

The main criteria of the developed model are the degree of correspondence between *external* and *internal congruences* [2, p. 47]. *External* congruence is associated with cognitive activity and cognitive

abilities, i.e. with that part of the person who interacts with the outside world. The correspondence of the projected object with the requirement of *external congruence* is connected with the consideration of cognitive processes in relation to the integrity of the subject under consideration. It should also be noted that the approach to creating impressions can be: subjective – the designer's own view of project situations; and objective – the use of sociological data and research of psychologists. Each of these methods has advantages and disadvantages, but in any case, the final choice is made by the designer.

However, the most important criterion for the quality of the project is its correspondence to *internal congruence*, the nature of which arises before a person in the form of a reality with such a high degree of disunity that a person loses its integrity of perception in interaction with it because of the emerging contradictions between needs. Congruence is achieved through the absence of internal contradictions, which are composed of differently directed needs, and violate the integrity and consistency between its psychological and physical components, and as a result, lead to a weakening of the actions or a negative sense of the realization of the need.

**Conclusion.** The model of designing the object environment by means of design, from our point of view, is a logical step in the development of theory and practice of design-design. The developed model corresponds to the modern state of culture and the person in it, striving to achieve harmony with the objective environment. The main characteristic of such an environment is its integrity: the more diverse the environment, the more disharmonious a person becomes in it. This kind of reflection is extremely useful, because it allows more accurate conduct of project documentation, the lack of which at the moment creates significant problems for communication within the design system.

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## COLOR CORRECTION: WHITE BALANCE AND EXPOSURE

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Images are the most common and transmit a huge amount of information in the modern world. Part of these images are photos. Often there is a need to edit photos to achieve the best result. This is related to shooting features such as the type of lighting and its quality, as well as the camera

settings. Processing images individually is quite costly, so the algorithms for color correction can be helpful.

Purpose of the study – automate the improvement of white balance on the image using statistical analysis, implemented using the programming language R.

**Material and methods.** The material of the study are methods of processing of digital images and their implementation in the programming language R. The studies used system analysis and statistical methods.

**Results and their discussion.** The algorithm for white balance is necessary for correcting the colors of an object on image to those colors in which a person sees the object in natural conditions. The algorithm looks for truly white areas, they are offset by color, and then each pixel subtracts the resulting offset by color and eliminates the color shifts in the image [1]. To implement the algorithm, a multi-paradigm interpreted programming language R was chosen. The programming language R is intended for statistical processing of data and working with graphics, and is a free open source-computing environment within the framework of the GNU project [2]. R works on different operating systems, including Windows, Mac OS and Linux, which makes it one of the most popular modern software for data analysis and visualization [3].



**Conclusion.** The programming language R has been studied to work with a large amount of data, such as images. A statistical analysis of digital photos is carried out. The algorithm has been implemented that makes it possible to simplify the procedure for color correction of images.

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## GRAPHIC TRAINING OF PUPILS IN THE SYSTEM OF ADDITIONAL EDUCATION

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The problem of updating of the secondary education system results in a new regard of the place and role at modern school of additional education. Additional education is the variable sphere of education, which is intended for expansion and deepening basic education, development of children abilities, realization of educational requirements of society. Additional education owns the considerable educational potential, which can improve quality of school education. Such institutions has the huge educational sphere, which consists of a big variety of educational programs.

It is impossible to do without knowledge of graphic sciences in the present world of information technologies. Requirement of graphic literacy is dictated not only by modern requirements of production, also by role of graphic disciplines in development of technical and spatial thinking, informative abilities of pupils. Need for graphic study of pupils is perceptible in these conditions.

Now graphic studying of pupils in educational institutions is realized through the subject “Drawing”. In addition, graphic constructions are available at lessons of mathematics, geography, labor training. At the same time at revenues to some specialties in higher education institutions, for example, “Architecture”, entrants take examination in drawing. Entrants should use the help of tutors as tasks at examination significantly differ from those that are offered in school textbooks.

However, graphic training of pupils has certain problems today and it demands modern ways of decision. Reduction of time for studying of the subject “Drawing” in schools affected negatively the quality of graphic training of pupils and students of many specialties of higher education institutions. In this regard, there is a need of improvement of teaching technique both the subject “Drawing” in school, and many graphic disciplines in Institution of higher education. A certain decision in such situation is represented in introduction of graphic training of pupils in educational process of institutions of additional education.

Research objective is to define possibilities of introduction of graphic training of pupils in the system of additional education.

**Material and methods.** The study was conducted among students of the art Department of “Mogilev children's art school № 2”. The survey was conducted. 90 pupils of 9–15 years participated in questioning. Methods of



the comparative and analysis, generalization, systematization, methods of theoretical knowledge creation, analysis of scientific and methodical literature are realized there.

**Results and their discussion.** For the purpose of increase in level of graphic training of school students the structurally functional model of graphic training of pupils in the system of additional education, which will help the pupil to acquire some knowledge and skills of graphic disciplines and to develop spatial representations. The structurally functional model in this case is considered as the complete system of graphic training of pupils, which consists from target, substantial, procedural, control sections, which are interconnected. The set of natural, functionally connected components makes a certain complete system. Components of this model reveal the internal organization of process of graphic training formation of the pupils, who are responsible for interaction of elements of this process and have functional purpose. Each of the called components has details according to functions and specifics of research process. Institutions of additional education guide this model. It was defined, that education has necessary qualities for successful introduction of graphic training of pupils in educational process.

Today to be made an experiment on efficiency of structurally functional model of graphic preparation as a result of her introduction in public institution of education “Mogilev children's school of arts No. 2”.

The survey showed that 29% of students indicated the need of graphic preparation, 41% of students expressed a desire to try the training, the remaining 30% of the students do not see the need for graphic preparation.

Therefore, finishing a theme on the potential of introduction of pupils' graphic training in additional education, it is possible to note that the offered structurally functional model will help: to expand knowledge of pupils of graphic disciplines, to form high interest; to stimulate educational and research activity of pupils; to develop spatial and creative thinking of pupils; to bring closer the basic education to modern requirements of society and personality; to adapt children to certain aspects of life in modern conditions.

**Conclusions.** It is possible on the basis of foregoing to make a conclusion that introduction of graphic study, which is the integral factor of formation of graphic culture of pupils and at the same time development of abstract thinking, spatial imagination, creative potential of the personality in the system of additional education is excellent solution of the problem of quality of pupils graphic training.

## 3D DESIGN VISUALISATION USING TECHNOLOGY OF PHYSICALLY-BASED RENDERING

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Project visualization has always been an integral part of design process. It helps not only to present project to an audience or client, but also appears to be a part of thinking and error resolving process on different design stages. Raw renders help more fully understand the designed object from both aesthetical and structural points of view.

Lately concept modelling and visualization became one of the beloved designers' tools, giving even-more rapid and descriptive results than hand-drawing or sketching. For presentation purposes, designers began to use powerful real-time visualization systems that can handle free movement of the viewer's position and the interaction with objects and data.

The goal of the article is to analyze rendering systems features and 3D content rendering services, find the most successful solutions for use by designers in their workflow. The application of modern visualization systems in design process today is of a great importance. Therefore, the right choice of service can make a huge increment in design workflow optimization.

**Material and methods.** The article draws upon Technical specifications of visualization services, statistical research of design market published online by various professional design networks in the 2017th and personal experience of the author in the industry. The following methods were used in research: method of synthesis and generalizations, method of deduction, historical method.

**Results and their discussion.** Not much time ago the only way to produce artistic, product and environmental visualization in 3D was non real-time photo-realistic rendering. Photo-realistic rendering places emphasis on the appearance of its output rather than the techniques used to derive it. There is no attempt to use physically realistic values for the light sources or the surface reflectances. In fact, the light sources themselves often have physically impossible values [1].

In the last decade of the XXth century an alternative solution came to the market of visual technologies: physically-based rendering. "Physically based rendering or PBR is a model in computer graphics that seeks to render graphics in a way that more accurately represents the flow of light in the real world" [2]. PBR engine generates physically accurate, high-definition, photographic output with control of all light and camera settings (focal length, aperture, depth of field, ISO setting, exposure, etc.) in real-time. But much of what makes a physically-based shading system different from its predecessors is a more detailed reasoning about the behavior of light

and surfaces. Shading capabilities have advanced enough that some of the old approximations can now be safely discarded, and with them the old means of producing art and design visualizations.

Physically based rendering was born, in part, out of the requirements of the US Department of Energy, which provided funding in the early 80's to the Lawrence Berkeley National Laboratory (LBNL) for research into new ways to use computers to simulate the transport of energy within complex spaces.

PBR has become increasingly popular over the past few years. With the development of OpenGL technology and rapid growth of graphical hardware (GPU) production real-time 3D rendering began to actively spread in our life [3]. Special popularity PBR technology gained in game development; Unity, Unreal Engine, CryEngine, Frostbite, Fox Engine, and many more game engines use it. These engines include not only visualization functionality, but also offer physics, sound, network, and interactive user input and output [4]. A big improvement to the realism of virtual environments is the inclusion of vegetation. Tree libraries are now available that are successfully used in commercial game products, architecture, landscape visualization.

In addition to game engines there is also an increasing number of asset-authoring, modelling and texturing software tools on the market like: Marmoset Toolbag, Substance Painter, Coat3d, Quixel. Game designers have already beloved Toolbag for the ease of operation, quick and high-quality PBR engine (one of CryEngine's variations) and a relatively low price tag. For the late 2 years it's gaining popularity among industrial and interior designers for presentation purposes. That is the way to generate images of the highest quality and realism, long before the products themselves have been manufactured. Later the necessary 3D model detail can easily be derived from prototyping and production tooling files. Unfortunately, the rapid development in computer game technology is almost unnoticed by the users of professional CAD software and engineers [5].

The trend is also expanding to the web area; most of modern browsers support WebGL technology that can perform 2D and 3D rendering in an HTML canvas and therefore can handle PBR. The result is growing number of web services that use PBR in real-time to showcase 3D objects online. Sketchfab tends to be the most popular social platform today for sharing and rating one's 3D scenes in world wide web. It also became a source of inspiration to 3D artists, industrial designers and animators. Another option is to use sketchfab as an online portfolio presenting work to public and clients. One of the most vivid and remarkable features that makes sketchfab unique, and helps it to stand out from the majority of similar online services is virtual reality implementation.

PBR technology aims mostly for PC environments, so that the visualization of photo-realistic, textured landscapes and objects is now

available for almost everyone. Such applications are far more desirable than pre-generated movies that are still commonly used for presentation purposes and the demand for real-time systems steadily increases. Especially in application areas like product design, architecture, urban and landscape planning the freedom of movement that game engines offer are of great interest [6].

**Conclusion.** Thanks to the wide dissemination of 3D technologies and means of physical world simulation with a fairly high degree of accuracy, people engaged in designing of real life objects have received an excellent tool for virtual prototyping and visualization of their designs. In turn, the development of technologies in this area leads to an ever-increasing working process optimization and, consequently, to the improvement of final product's quality in shorter periods of time.

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## **PEDAGOGY OF CHILDHOOD IN THE MODERN CONTEXT: PROBLEMS AND PROSPECTS**

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### **PECULIARITIES OF MANIFESTATIONS OF ANXIETY AND FEAR IN AUTISM**

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Studies of various approaches to the study of the personality of pupils with infantile autism studied by authors such as I.I. Mamaychuk, I.E. Guseva, E.R. Baenskaya, S.D. Zabramnaya, M.Ratter, L.N. Dem'yanchuk, E.S. Ivanov, O.S. Nikol'skaya, I.I. Mamay, K.S. Lebedinskaya, L.M. Shipitsina, S.A. Rozenblyum, N.G. Manelis, L.S. Pechnikova, M.M. Libling, I.V. Kovalets, etc.

Children with autism have a high intensity of fears, and increased fixation on them. The fact of the fear of natural. Unusual is the severity of this reaction and its irresistible. Fears that appear in children with autism at an early age, distinguished by the vagueness, diffuseness and often do not have causes, arising on the background of General anxiety and anxiety, however objects of fear in children with autism very much. The fears of children with infantile autism can be confusing to others, being directly related to the special touch of the vulnerability of such children [1].

As shown by data from a special experimental psychological studies (V.V. Lebedinskiy, O.S. Olikheyko), the fears occupy one of leading places in formation of autistic behavior. But sometimes a child's fears still reflect the positive dynamics of psychological development. They indicate the emergence of a more adequate perception of others about the emergence of a sense of self-preservation [2].

The aim was to study the characteristics of fears and anxiety level in children with early infantile autism.

**Material and methods.** A focused study of the psychological characteristics of anxiety and fears in children with early infantile autism was held from February to may 2017 on the basis of the state educational "Vitebsk city center of correction and development training and rehabilitation". Each subject was studied the level of anxiety and the nature of fear. The study involved 10 children with early infantile autism. As of psychodiagnostic methods in the pilot study were used: "Test anxiety" (Temmpl R., Amen V., Dorki M.), "Methods of diagnostics of children's fears" (A. Zakharov), conversation with teachers and parents of children.

**Results and their discussion.** The study of level of anxiety in children with infantile autism showed that 88% of children in this category high level



of anxiety, 12% identified a medium level of anxiety. These results illustrate the following typical examples of the assignment. When you run the "Test anxiety" test. M. in 7 cases out of 14 chose a sad face. Demonstration and explanation of the drawing, in which the girl goes to sleep alone, chose a sad face, and explained his choice as follows: "the Girl without a mother". The demonstration pattern in which the mother scolds the girl, she picked the sad face, and explained his choice: "Mom's mad". The demonstration of the figure, which depicts a girl with parents M., chose a cheerful face, explaining: "Mom next door". This example suggests that the child's overall high level of anxiety, including in the dyad "child-adult" in situations simulating everyday activities.

Subject N., performing this technique, in 9 cases out of 14 chose a sad face. For example, when demonstrating drawing in which the boy aggressively attacked with a chair in hand, the child chose a cheerful face and explained, "I Love Spider – Man". When demonstrating drawing in which a boy plays with a small child, the subject covered her head with a jacket and began to cry. When demonstrating drawing in which two children run away from boys (insulation), he chose a cheerful face, and explained the choice as follows: "Afraid of me". This example suggests that the child's overall average level of anxiety and high level of anxiety in the dyad "child-child".

Using this technique it was possible to identify that children with early infantile autism, high level of anxiety in the dyad "child-adult" in situations simulating everyday actions – 70%, the average level of anxiety in the dyad "child-child" – 30%.

The study of fears in children with early infantile autism have shown that 80% of the students is dominated by social and spatial fears, 15% is dominated by fear of the animals and fairy-tale characters, and 5% is dominated by medical fear. Physical fear, fear of death, fear of nightmares and darkness was revealed.

Due to the fact that the subjects with infantile autism bad were to contact, were interviewed with their parents and teachers. For example, the subject's mother spoke about the fears N.: "He is afraid to stay alone in the room, but at the same time, not like when he starts playing or something to ask. If the yard is suitable unfamiliar children, N., begins to cry and asks to take him home. N., it is not like the process of dressing, new clothes can immediately break". This suggests that the child is dominated by social fears, and present spatial fears.

Teachers and parents of test E., spoke about the fears of the child: "E trying to play in that corner where the smaller children, if a child begins to touch that it can begin to shout. Afraid to be alone in a room with a closed door constantly opens all doors, the house was even broken glass in the door. The boy is afraid that he will be punished. New people contact, runs away. A new dress for a very long time gets used, not always wears. Also afraid to



sleep in the dark”. This example suggests that the test E. also dominated by social and spatial fears.

As mentioned above, have children, have dominated the fears animals and fairy tale characters. For example, from interviews with the teacher-defectologist, it was revealed that the subject W. at the sight of the images of the dog, the wolf tries to crush, to break. If you show a toy dog, wolf – throwing, can begin hysterical. All the stories with these characters U. is not listening, starts to throw surrounding objects.

Thus, we can conclude that most children with early infantile autism has high levels of anxiety and are characterized by social and spatial fears.

**Conclusion.** Fears and anxiety is one of the leading places in formation of autistic behavior. The problem of anxiety and fear is manifested differently with different variants of autism dysontogenesis. The specificity of the fears of a child with early infantile autism is not so much in their content as in their intensity and durable fixation. Hence, the child with early infantile autism needs constant, skilled medical – psychological-pedagogical support. Speaking about such a complex developmental disorder, children's autism, you need to understand that overcoming or reducing fears and anxiety may not constitute separate special task of psychological assistance to the child. This work is a necessary part of the holistic system of remedial actions aiming at the development of cooperation between the autistic child with the environment, increasing its activity, endurance, commitment, flexibility in contacts with the world.

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## **SKILLS OF SPEECH ETIQUETTE IN CHILDREN WITH SPEECH DISORDERS OF PRESCHOOL AGE**

**A. Bumazhenko**

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The preschool child is particularly sensitive to the assimilation of the speech, and if a certain level of proficiency in their native language is not achieved by 5–6 years, this way, as a rule, cannot be successfully completed at a later age stages. Children who have not learned the culture of communication are less successful in educational activities and thus experience further difficulty in adapting to school.

Learning etiquette vocabulary, the child “appropriates” part of the social experience of the speech of the people, seizes the cultural and speech patterns characteristic of the cultural environment in which it is located. The introduction of the verbal formulas of speech etiquette in the overall system of verbal interaction preschooler with surrounding adults and peers will contribute to the creation of a comfortable communicative field and provide an obvious influence on the spiritual world of the child.

Etiquette is an asset and an indicator of culture, the basis of educated person that help to understand how to behave in situations of modern society, to find a common language with other people.

According to N. Formasnovskaya, speech etiquette is the rules governing verbal behavior, the system of national specific stereotypical, stable formulas of communication, adopted and prescribed by the society to establish contact interlocutors, maintenance and interruption of contact in the chosen key [1].

The purpose of this study the specifics of formation of speech etiquette of children of senior preschool age, including those with speech disorders.

**Material and methods.** For the pilot program was developed of observation that determines the sequence of the experimental work and evaluation criteria.

1. What polite words children use in their speech during the day.

High level (3 points) – uses in speech more than 5 different forms of etiquette expressions.

The average level (2 points) – uses the 3 to 5 words of various forms of etiquette expressions.

Low level (1 point) – the child in his speech, uses up to 2 forms of etiquette or not use them at all.

2. Use children words of welcome this morning.

High level (3 points) – uses in speech more than 3 different forms of greetings with adults and with peers without prompting.

The average level (2 points) – uses the 2–3 different forms of greeting with adults without reminder and with reminder with peers.

Low level (1 point) – the child in his speech, uses 1 form of greeting only with an adult or not drink at all.

3. Use words of apology in conflict situations, words of gratitude in appropriate situations.

High level (3 points) – independently uses the 3 or more forms of apology.

The average level (2 points) – sometimes independently uses the 1–2 forms of apology. Apologizes with a reminder of the adult.

Low level (1 point) – the child in his speech does not use forms of apology at all.

Total score:

High level – 8–9 points

Middle level – 6–7 points

Low level 3–5 points

The data obtained were recorded in a diagnostic card.

**Results and their discussion.** Experimental work was conducted on the basis of SEE “pre-school child development centre No. 2 of Vitebsk”, SEE “Special kindergarten No. 18 for children with severe speech disorders of Vitebsk”. Analysis of the results of experimental work allow to draw the following conclusions.

Not all children use in their speech a polite word. Most often speech used greetings, farewells, requests. Basically, these are the most common words: Hello, thank you, please. The ratio of the use of the formulas of speech etiquette has been as follows: gentle words – 40%, word-apologies – 33,6%, words-welcome – to 26.4%.

In particular, the highest frequency of use of polite words with the following: Hello – 20%, thank you – 16% – 16%, good morning – 16%, goodbye – 10%, hi 6%, and Goodnight – 6%, other – 10%.

Among the words of welcome, the frequency of use had the following results: “Hello” – 39,4%, Hello – by 36.4%, a good day is 6.1, not etiquette 18.1 per cent.

From words of apology prevailed so 16.6% of it; sorry – 16,6%; I’m sorry – 14,2%; sorry – 9,5%; I would never – 7,1%; excuse me, please – 4,7%; excuse me, please – 4,7%; excuse me, please – 4,7%; apologize and 2.3%; never again – 2,3%; I’m so sorry – 2.3 percent; let's put up 2.3 PCT; I accidentally – 2,3%; I didn't mean to – 2.3 percent; excuse me, I will not do it anymore and 2.3%; the excuse is 2.3%; to forgive is 2.3%.

Thus, the observation showed that most of the children are not formed skill of speech etiquette. Preschoolers remember polite words only after a reminder by the teacher or parents. Sometimes children show rudeness, impoliteness. Also, there are situational adherence to the rules of speech etiquette.

In the group of subjects with a low level of available skills of speech etiquette was seven, accounting for 39% of the total number of children in this group, respondents with a medium level of available skills of speech etiquette - ten, which is 55.5%. Pupils with a high level of existing skills of speech etiquette – one that is 5.5%.

In accordance with the Educational standard of preschool education the content of educational areas "Socio-communicative development" and "Speech development" aimed at: learning the norms and values accepted in society, including moral and ethical values; communication and interaction of the child with adults and peers; the possession of speech as a means of communication and culture.

Based on the requirements of the Educational standard of preschool education, we have developed a system of work on formation of speech

etiquette in children of preschool age, including those with speech disorders, included three distinct phases with different objectives, forms, content of the work.

Direction – to determine the level of knowledge and understanding of children of senior preschool age on speech communication culture with subsequent expansion of knowledge and formation of skills to use etiquette formulas in everyday communication.

Forms of work performed: a cast of real-life situations; games and exercises; specially prepared classes; exhibitions of books about etiquette; reading of works in their spare time; reading poems; the analysis of Proverbs and sayings; taking into account individual characteristics of children in the group.

**Conclusion.** As a result of the ascertaining experiment has found that preschoolers with speech disorders characterized by a low level of formation of skills of speech etiquette. This confirms the need for more in-depth work on forming these skills.

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## **THE IMPACT OF SPEECH DISORDERS ON THE DEVELOPMENT OF IMAGINATION OF PRESCHOOL CHILDREN**

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Currently, the educational paradigm is focused on the development and implementation of creative potential of children, the formation of creatively active person. The basis of creativity, driving force of any creative process is imagination, which largely determines the development of the whole person (L.S. Vygotskiy, G.D. Kirillova, M.V. Kozubovskiy, J.L. Kolomenskiy, Y.A. Poluyanov, etc.).

The limited interaction with adults, peers deprives children with speech disorders necessary information and knowledge of the techniques of reconstruction of existing ideas. Therefore, the imaging process in this case is performed in addition to reflective, and even compensatory function. For this reason, the problem of studying features of development of imagination in children with impaired speech and definition of pedagogical conditions for shaping of mental functions in this category of children is particularly high. The development of a child's imagination is significantly associated with the development of speech. In the first third of the XX century L.S. Vygotskiy wrote about the fact that a violation of the verbal function there is a decrease

in activity of the imagination; the detainees in the speech development of children are retarded in the development of imagination [1].

Especially the imagination of children with speech disorders studied Popova L.G., Pasyukova N.A. Ovchinnikova T.S., Gluhov V.P., Kondrashov, S.P., Dyakov V., Dyachenko O.M., Kalyagin V.A., etc. Development and recreating, and creative imagination of children with speech disorders occurs in accordance with the same laws as the development of imagination of children with normal speech development. But despite this, the imagination of children with speech disorders are somewhat poorer than the normal-speaking peers, its products are less original and consistent, structured worse, his images are a little filled with emotions [2].

The aim of the investigation was to study the characteristics of recreating and creative imagination in preschool children with General underdevelopment of speech.

**Material and methods.** A pilot study was conducted on the basis of PIE "Special kindergarten № 18 for children with severe speech disorders of Vitebsk". The total number attracted to the study of individuals amounted to 20 people. As methods of experimental study of imagination has been selected: methodology "What is it like?" (Filicheva T.B., Chirkina G.V.) was used to diagnose the level of development of re-creative imagination and the definition of originality and flexibility of thinking; the method of "Good and bad" – with the aim of identifying the level of development of re-creative imagination and the emotional sphere; the technique of "Fiction" and "Think story" – to determine the level of development of creative imagination.

**Results and their discussion.** In interpreting the data of experimental study of the characteristics of recreating the imagination of preschoolers with speech disorders were obtained the following results. 60% of subjects fully completed the task "what's it like?", 35% in part (from three subjects called 2), 5% – lost technique. For example, Andrew (6 years old) carried out the task independently. The child showed interest in the job. Showed activity, diligence, high efficiency. The answer to the question proposed at once, called one figure two options. Vlad (6 years) needed assistance from the experimenter. Difficulties caused triangle, long thought of what items similar to it. To the rest of the figures could name objects.

The study recreates the imagination of children with speech disorders using the technique "good or Bad" showed that 80% of participants coped with the task, 15% partially and 5% failed.

For example, Edik (7 years) when performing this task, he sought the help of an adult. A small difficulty arose in the examination of images which are drawn there was a boy standing in a puddle. The child gave the answers with leading questions. Drawn objects are not caused trouble. Was an adequate assessment.

When interpreting data from experimental study of the creative



imagination of children with speech disorders were obtained the following results. The study of the creative imagination of preschoolers with speech disorders using techniques "Fiction" showed that only 20% of the subjects drew a non-existent object or phenomenon, 30% - non-existent, but used 40% of the existing facility and 10% of the subjects did not cope with the task. For example, Anastasia (6 years) the task was performed by the experimenter, explaining that he can't draw animals. However, the process of joint work fascinated her, she liked to dream. While drawing, she began to tell me what cartoons I watched, and characters seen in these cartoons.

The study of the creative imagination of preschoolers with speech disorders using techniques "create the story" showed that 60% of the subjects came up with a story based on the already existing objects and phenomena, 20% of subjects based on existing objects and phenomena, but already used 10% of subjects on the basis of existing objects and phenomena, and 10% of the subjects did not cope with the proposed assignment. Thus, most of the subjects were making up stories is simple, with the already known characters, the stories and these characters did not possess any non-existent abilities; a bunch of volunteers came up with stories based on books read or watched cartoons and only 2 preschoolers with speech disorders were able to some extent to come up with a story with elements not existing phenomena or objects. For example, Vlad (6 years) when composing the story used a non-existent animal in the story was used imaginative story. He dictated the story with interest, asked him to read it to him (the text of the story: "the Mouse-hare was on orbit. There he saw a huge jug. They got in there because I wanted to see if there is a Bear – toed"). The other subject, Thank (6 years) performed the task with interest, described the actions of his character, which drew in the previous assignment. The text on the basis of the scanned child cartoons and films ("the Super hero saving people, helping the helper, killing bad bandits").

**Conclusion.** Thus, on the basis of the obtained experimental data it can be concluded that children of senior preschool age with General underdevelopment of speech, ideas about the objects to be inaccurate and incomplete. Have trouble in selecting items that are similar to this or going after strange figure. The children in this category have trouble when working with the scene pictures, a brief description of their content is not detailed. In practice there is a violation of the ability to convert the finished images and creation on this basis new. The drawings of preschool children with General speech underdevelopment are poverty of content, they cannot figure in concept, difficult, if you want to come up with a new pattern. I must say that children have great difficulty in the creative tasks, relying when it is run on images of existing objects, thus recreating the imagination, the most well-preserved in speech-defect, rather than creative.

The children of senior preschool age with General speech underdevelopment have underdevelopment of the emotional sphere:



hampered differentiation of emotional States, as well as the understanding and expression of the emotions in cartoon characters and people. Their speech is inexpressive, meaningless, disrupted the structure of the phrase, connection between sentences, characterized by the presence of agrammatism. There is a trend to a more “delayed” entry into work and, in General, the slow pace of implementation of creative tasks.

Thus, preschool children with speech disorders, practical experience is not enough secured and is generalized in the word, consequently, delayed the formation of concepts. It should be noted that children have great difficulty when performing creative tasks, recreating the imagination the most well-preserved in speech-defect.

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## **STUDY OF THE FEATURES OF AN INCLUSIVE LITERACY OF HIGH SCHOOL GRADUATES AND STUDENTS OF PEDAGOGICAL SPECIALTIES**

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Today in the education system of the Republic of Belarus established a model of integrated education, that is a significant achievement compared to the previous model of separate education when a child with special educational needs had no chance to learn with their peers in kindergarten or school. But as the development and expansion of integrated classes and groups in kindergartens logical continuation of the system of integrated education is inclusive education. Under inclusive education is defined as the creation of equal opportunities for education for all, without exception, the inclusion in the educational process of all children regardless of origin, culture, gender, disabilities [1].

A great contribution to the development of inclusive education made the following teachers and researchers: V. Khitryuk, A.M., Zmushko, E.I. Ponomareva, S.V. Alyokhina, V.I. Lopatin, N.N. Malofeev, C.I. Kuptsov, V.Ph. Nikolenko [2].

In connection with the active development of inclusion in the Republic of Belarus, there is a need to educate people on this issue, since the development of inclusion depends on the awareness of its necessity.

The aim of the study was to determine the level of inclusive literacy of school students and students enrolled in the first year of VSU named after P.M. Masherov.

**Material and methods.** A pilot study was conducted on the basis of the state educational institution “Gymnasium № 6 in Vitebsk” and VSU named after P.M. Masherov in March 2017. The total number attracted to the study of individuals made up of 16 high school students and 17 students of 1 course of specialty “Primary education”. To conduct the study was composed of questionnaires for determining the level of inclusive literacy.

The study was carried out with two different social groups: students and graduates of the school for the purpose of comparison of awareness among young people on the topic of “Inclusion”.

**Results and their discussion.** Comparative analysis of the obtained results allowed to draw the following conclusions. The senior pupils have low level of formation of ideas about inclusion. The first-year students level of inclusive literacy above. So, 47% of students level of inclusive literacy high (high school graduates – only 25%), 53% of students level of inclusive literacy insufficient (a similar situation is observed in about 75% of senior students).

Qualitative interpretation of the obtained results showed that the greatest difficulties as students, and the students met the definition of “inclusion”. For example, Glory P. not differentiarum the concept of “inclusion” and “illusion”, Alla B. has defined inclusion as “a complex scientific term associated with the science”. Some subjects were able to accurately define this concept, but the questions that reveal qualitative characteristics of the concept of “inclusion” could not answer that demonstrates a lack of awareness of existing knowledge.

When answering the questions concerning a choice of tactics of behavior in situations of interaction with a person with special needs, high school graduates showed great tolerance for children of the named category. So, 55% of the subjects in this group would leave a cafe if next to them there was a child with special needs with inappropriate behavior (among the subjects were students, 20% of subjects).

The greatest willingness to cooperate with persons with special needs, the subjects showed when determining what types of educational institutions that are suitable in their opinion for children with special educational needs. So, 90% of the students called the educational institutions of education, as an explanation for their choice they have been called following criteria: the presence of educational institutions adequate learning conditions for children with special needs (25% of answers), possibility of communication of children with exceptionalities with peers (35% of respondents), the idea of commonality of human rights (30% of participants), readiness of teachers for inclusive education (10%). In the group of graduates 60% of respondents also called secondary education major in training of children with peculiarities of

psychophysical development. However, many of them (40% of the total number of high school graduates) called the "light" diagnosis of the child as a criterion of the ability of the organization to him inclusive education.

**Conclusion.** Thus, the inclusive level of literacy of school leavers and students of specialty "Primary education" shows the lack of completeness of their inclusive culture that is an obstacle to the implementation of the ideas of inclusive education. There is a need to develop and carry out a number of measures to improve inclusive literacy in different segments of the population, including using the results of experimental studies.

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## **FORMATION OF TOUCH STANDARDS AT PUPILS OF THE SECOND UNIT OF AUXILIARY SCHOOL**

**M. Kondrat'yeva**

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Numerous studies of the characteristics and patterns of perceptual development of children, conducted by Z.M. Boguslawska, L.S. Wenger, A.V. Zaporozhets, V.P. Zinchenko, A.A. Kataeva, N.N. Poddjakov, A.P. Usova put forward the problem of sensory – perceptual development of children as a priority.

The peculiarities of sensory-perceptual sphere of children with intellectual disabilities were explored in detail by domestic psychologists – I.M. Solovyov, K.I. Veresotskiy, M.M. Nudelman, E.M. Kudryavtsev, and others, including children with moderate intellectual disabilities – A.R. Maller, G.V. Tsikoto, M.V. Shoreway etc. The perception of children with intellectual disabilities is incomplete, chaotic, fragmented, highlighting the part they do not see the object itself, not isolated or poorly allocate an object from the background [1]. However, under moderate and heavy intellectual deficiency, the formation of perceptual processes. A study on the formation of this category of children visual-constructive operations showed the possibility of adoption assistance children in a situation when there is no requirement to speed and autonomy in the early stages of activity [2].

The goal is the study of sensory processes in primary school children with moderate intellectual disabilities.

**Material and methods.** Ascertain experiment was conducted on the basis of public institution of education "Auxiliary school № 26 of the city of

Vitebsk". In experiment took part 20 students of 1–5 classes at the age of 7–13 years enrolled in the program II office of auxiliary school. In the experiment used the following methodology: the methodology of studying perception of forms; methods of studying peculiarities of color perception; methods of studying the peculiarities of the perception of form, the methodology of studying perception of spatial relations.

**Results and their discussion.** After conducting with the students of the junior class enrolled in the program II of the department of assistive schools, methods of studying the features of perception of form were obtained the following results:

- lost job 55% of the subjects part of the younger students did not understand the instructions, even when repeating and simplifying it.

- partially coped with the task – 35% of students who made mistakes in the mapping. For example, Renata B. rhombus and rectangle were correlated with the square, Dima B. rhombus correlated with a triangle, and a rectangle with a square. Challenge was requested to name the shape.

- coped with the task – 10% of the subjects, however, the Andrew B. and Mary S. coped with the task, only after the technique was as simple as possible. They correlated the figures, found the figure following the instruction and correctly called geometric shapes.

Thus, the study of form perception in students with moderate intellectual disabilities had difficulties that are associated with insufficient and inaccurate representations of this category of children about geometrical shapes, with the inability to relate them. Due to the presence of speech defects, and in some cases ignorance is geometrically forms, there was a uniqueness in their naming. The most recognizable and identifiable form for this category of children is a circle, and the definition and naming of a rhombus and rectangle have caused the greatest difficulties.

The results of the methodology of studying the peculiarities of color perception showed that:

- do – 10% of the test, they correctly identified the colour correctly identified and applied the color, never made a mistake in naming colors, but due to the peculiarities of speech development, observed the originality of their naming.

- partially completed the task in 20% of subjects who made errors when mapping colors, for example, Nastya K. correlated color orange with red, while a given color error was not, because of speech defects was observed peculiarity in the naming of colors;

- lost job – 70% of the subjects, they did not understand the instructions, even after the simplification of the user, not trying to correct your wrong answer, some subjects refused to perform the job or pointless pointed to different objects on the methodical material, quickly distracted.

Thus, when studying the features of perception of color, students are

poorly focused in the task that demanded maximum simplification of the user, the students could not cope or partially cope with the job due to the fact that he did not know the names of flowers or confused color and correlated correctly. The greatest difficulties were caused by the definition of the color orange.

The study of the perception of spatial relations were obtained the following results:

- completed the task in only 5% of subjects. Nastya K. focused on the plane of the sheet, correctly pointed out the center, top and bottom sheet, the right and left sides, correctly established the correspondence between the image of the object and its spatial location on the sheet of paper.

- partially completed the task in 20% of subjects who correctly pointed out the center of the sheet; determining upper and the lower part of the leaf and, especially, the right and left sides was troubled; when you define an image and placing an object on the sheet made mistakes.

- lost job - 75% of subjects. They are unable to name pictured objects, in some cases there is onomatopoeia in the determination of the object position on the sheet answered either "don't know", or wantonly run her fingers along the sheet and pointed to a random object.

As a result, methods for studying the perception of spatial relations, we can conclude that students have difficulty determining the location of the object on the sheet, by naming the object word. The most defined part of the sheet was the center, the most difficult was to determine the right and left sides of the sheet.

**Conclusion.** Thus, younger students with moderate intellectual disabilities there are significant difficulties in the assimilation of sensory standards. So, they make mistakes in naming shapes, colors, name them correctly, the students could only the second or third attempt, poorly oriented in space. Because of the special needs students are easily distracted from the job, was tired, needed repetition of instructions.

The peculiarities of the development of sensory processes students with moderate intellectual disabilities require the organization of special correctional and developmental work that will become the Foundation to continue this research.

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**RESEARCH OF THE CHILD PARENTAL RELATIONS  
IN THE FAMILIES RAISING CHILDREN WITH FEATURES  
OF PSYCHOPHYSICAL DEVELOPMENT**

**O. Kornilova**

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The modern system of vocational education in Republic of Belarus endures the difficult period of the updating and modernization that staticizes problems of search of the new ideas, reconsiderations of the principles and approaches in training and education of children with deviations in development. The solution of these questions demands close cooperation of all experts of system of vocational education with families of children with features of psychophysical development. Every year in Republic of Belarus growth of number of the children with features of psychophysical development experiencing difficulties of social and psychological adaptation in the conditions of institutions of education is noted [4]. The important role in the course of training and adaptation to establishment of education is played by character of the child parental relations. The experts working with the families raising children with features of psychophysical development noted as the most hardly solvable the following problems: the negative relation close to children to features of psychophysical development, inadequate parental installations and models of education, the adverse interpersonal relations in families (A.G. Moskovkin, E.V. Pakhomov, A.V. Abramov) [3].

**Material and methods.** For the purpose of studying of features and character of the child parental relations in the families raising children with features of psychophysical development we have conducted an empirical research of the child parental relations with the help of the test of the parental relation (A.Ya. Varga, V.V. Stolin). 10 parents having the children with features of psychophysical development visiting GUO “Auxiliary School No. 26 of Vitebsk” participated in our research.

**Results and their discussion.** Scale “Acceptance / Rejection”. From ten studied families two parents have gained low point (from 0 to 8). It means that the adult feels in relation to the child generally only negative feelings: irritation, rage, disappointment, even sometimes hatred. Such adult considers the child the loser, doesn't trust in his future, low estimates his abilities and quite often relation slights the child.

Scale “Cooperation”. 30% investigated have gained high point (from 7 to 8). It is sign that the adult shows sincere interest that he interests the child, highly appreciates abilities of the child, encourages independence and the child's initiative, tries to be with him as equals.



Scale “Symbiosis”. 20% of examinees don't establish a psychological distance among themselves and the child, try to be closer always to him, to satisfy his basic reasonable needs, to protect from troubles. 30% (incomplete family) opposite, establish a considerable psychological distance among themselves and the child, care a little about is mute.

Scale “Control”. All 10 parents have shown GPA on this scale. It means that control of actions of the child is established moderately, there is no strict disciplinary framework.

Scale “Relation to failures of the child”. 20% of examinees consider that the child is a little loser and concern him as to an innocent being. The interests, hobbies, thoughts and feelings of children seem to them frivolous therefore the parent ignores them.

The most optimum is such level of the parental relations as cooperation is socially desirable image of parental behavior. The parent highly appreciates abilities of the child, takes pride for him, encourages an initiative and independence, tries to be with him as equals. It is possible to carry the relations on the “symbiosis” and “little loser” type to neutral level. We have carried such type of the parental relations as “rejection” and “authoritative hyper socialization” to the negative level of the parental relations. The parent perceives the child bad, unadapted, mostly feels rage, irritation, disappointment to the child.

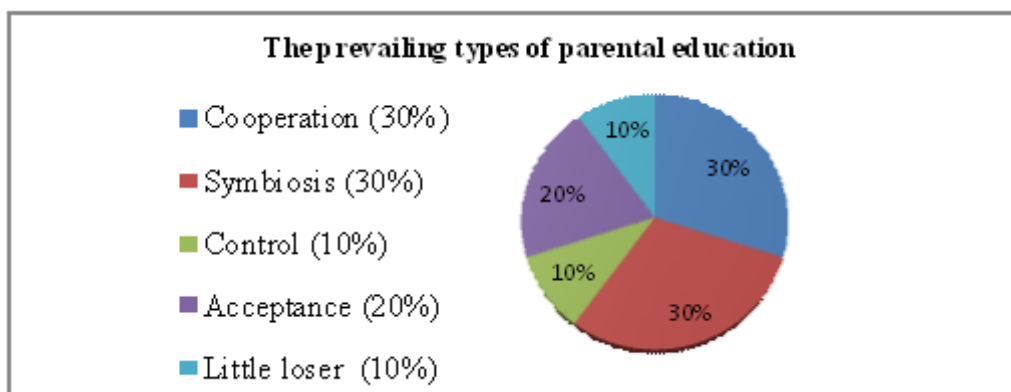
The questionnaire of the parental attitude towards children (A. Ya. Varga and V.V. Stolin) has revealed the following (table).

Table - Level of the parental relations

Family No.	Type of family education
1	symbiosis, acceptance
2	little loser, symbiosis
3	control, acceptance
4	cooperation
5	acceptance, symbiosis
6	symbiosis, cooperation
7	acceptance, little loser
8	cooperation
9	symbiosis, cooperation
10	acceptance

The prevailing types of parental education in families of the examined children are given in the drawing.

*Drawing – The prevailing types of parental education*



**Conclusion.** Thus, the optimum parental relations are observed in 3 families (30%); 5 families (50%) are carried to neutral level; the parental relations which have negative character are shown in 2 families (20%). The prevailing types of education is “cooperation”, the most favorable type of education in family and “symbiosis” which is neutral. However guards that rather large number of parents have defined the style of education as “acceptance rejection”, i.e., on the one hand, parents love the child, and, on the other hand, he irritates them with the behavior. It means that many families use the inefficient relations with the child that leads to emergence in children of uneasiness. During the research it has been revealed that the neutral (average) level of the child parental relations which is characterized by insufficient relationship of parents with children prevails.

The analysis of results of relationship in family shows that need psychological correction both children, and their parents: they need to help to seize skills which would contribute to the development of the positive child parental relations.

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## THE FORMATION OF SKILLS IN READING AND WRITING IN PRESCHOOL CHILDREN WITH INTELLECTUAL INSUFFICIENCY

**E. Ladik**

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For successful acquisition of literacy in children of preschool age should be formed the main background for the formation of skills of reading and writing [1, p.16]. So, to complete the formation processes of reading and writing required integrity and quality of the activities of the Central and peripheral parts of the analyzer systems, their coherence (B.G. Anan'yev, A.R. Luriya, L.S. Tsvetkova, etc.); excellent location of the visual and motor functions (E.V. Guryanov, M.M. Lame, S.P. Efimova, E.V. Novikov, etc.); understanding his speech (L.S. Vygotsky, M.E. Katzev, R.E. Levina, D.B. Elkonin, R.I. lalaeva, etc.); degree of development of attention, memory, thinking and various cognitive actions (L.S. Vygotsky, R.E. Levina, L.I. aidarova, N.N. The Algazin, I.V. Prischepova, etc.), sensory and personal maturity of children (L.S. Vygotsky, V.V. Kholmovskaya, I.A. Domashenko, S.V. Mukhin, M.I. Lisin, etc.). Data mental and physical components are essential to readiness for mastering the written language, and disruption in their education can be a factor in the emergence of difficulties in mastering reading and writing [2, p. 68].

Visual perception of preschool children with intellectual insufficiency is characterized by deficiency, which prevents sufficiently fast and high-quality memorizing the graphic form of the letter, its differentiation with similar graphemes, the establishment of correlation of the printed and written, uppercase and lower case alternatives each letter.

One of the obstacles in the formation of writing skills is the lack in preschool children with intellectual insufficiency of a single motor coordination operations, which are most clearly traced in the movements of the small muscles of the hand [3].

The aim of the study was to identify features of formation of prerequisites of mastering the written speech at younger school students with intellectual disabilities.

**Material and methods.** With the purpose of studying the condition of formation of prerequisites of written language in children with intellectual disabilities, we conducted a pilot study. The experiment involved 10 children with intellectual disabilities. Were studied the following prerequisites for the formation of writing skills:

- Phonemic hearing (the method of M.F. fomichevoy);
- Pronunciation (methodology G.V. Chirkina);

- Visual perception and spatial orientation (method of A.P. Voronova);

- As the motor skills of the hand and fingers.

**Results and their discussion.** When interpreting the results of the pronunciation skills revealed that only 10% of the subjects can not be traced to defects *zvukoproiznoshenija*. 27% of pupils there is a violation of pronunciation the two sounds. 27% of subjects demonstrated a violation of the pronunciation of three sounds. 36% of children with disturbed pronunciation of four or more sounds. For example, Daniel S. the following utters the words proposed in the diagnostic procedure: "koska" (the cat); "isit beetle" (the beetle buzzes); Alexander T. said sentences like "Sisi Alat UBA" (my teeth hurt), "see seit and Zeke zizit" (the Snake hisses, a beetle buzzes).

100% of subjects revealed the presence of violations of syllabic structure of words and *zvukavapano*. So, Alexander T., says: "the jelly of cuka" (kissel from cranberries), "elezioni" (policeman). 10% of students with intellectual disabilities was observed in the introduction the acoustic structure of the word. For example, Maxim D. said: "Corber" instead of "ship".

The analysis of a condition of phonemic hearing showed the presence of abnormalities in 100% of subjects. Thus, when performing tasks where the children had to raise their hand if the word has the sound [W], 20% of younger schoolboys with intellectual insufficiency are unable to distinguish a single word; two words with the sound [W] was able to allocate 20% of children; three words – 30% of subjects 20% of students – 5 words; only 10% of the subjects were able to identify all the words.

The state of visual-spatial orientation of younger schoolboys with intellectual insufficiency were analyzed according to the following criteria:

1) Availability of all structural components. When performing tasks drawing on sample 80% of children have all the structural components. 20% of children when drawing the shape on the model is missing one component: a line that connects the triangle with a rectangle.

2) Compliance of the structural components of the sample while drawing the shape on the model: 70% of the test picture matches the sample. 30% of students with intellectual disabilities figure does not match the pattern.

3) the character of the lines when drawing the pattern on the model and presentation: 20% of children lines in figures solid; 10% of subjects straight lines in the figures; 20% of students draw straight and curved lines; 20% of children in the figures is dominated by straight and curved lines; 20% of subjects dominated by a broken line; 10% of first-graders - lines on the drawings straight and broken lines.

4) Size, location on the sheet size of the drawings and their location in 100% of subjects did not conform to the sample.

When running the job on a remodel of letters, all proposed as part of the diagnostic methods of the letter was not able to alter any one subject. 10% of

younger students correctly reconstructed four letters. 30% of children are incorrectly reconstructed all the letters. 50% of children correctly reconstructed one letter. 10% of the subjects correctly remade 2 letters.

Analysis of the status of the motor skills of the hand and fingers of students with intellectual disabilities revealed a deficiency of fine motor skills 70% of younger schoolboys with intellectual insufficiency in 30% of subjects noted engine failure.

**Conclusion.** Thus, the lack of formation of preconditions of formation of skills of reading and writing observed in preschoolers with intellectual disabilities, continues to affect the formation of these skills in the early school years. So important is the implementation of individual approach in the formation of the prerequisites of writing in dubuquey period literacy of younger schoolboys with intellectual insufficiency, and in the training and education of preschool children with intellectual insufficiency. The obtained experimental data will be the basis for the development of the content of correctional – developing programme for the implementation of individual approach in the development of the preconditions of formation of skills of reading and writing in children with intellectual disabilities of different age groups.

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## **PSYCHO-PEDAGOGICAL FEATURES OF MATHEMATICAL COMPETENCIES IN HIGH SCHOOL STUDENTS WITH INTELLECTUAL DISABILITIES**

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Research studies on social development of children with intellectual disabilities, conducted by E.L. Goncharovoy, O.I. Kukushkinoy, T.K. Korolevskoy, E.A. Strebelevoy, A.V. Zakrepinoy confirm that such a violation of mental development as an intellectual failure reduces the ability of the child acquisition of life experience, his preparation for independent living. The study of the formation of life-practical ideas students with intellectual disabilities in mathematics lessons engaged in by such researchers as L.V. Kuznetsova, I.M. Bgazhnokova, A.A. Kataeva,

M.G. Strebeleva. The relevance of this question in math class is determined V.P. Grikhanov, S.G. Abassova and E.E. Kolosova. The main goal of mathematics education should be the development of skills mathematically, and therefore logically and consciously explore real world phenomena. The realization of this goal can and should contribute to the solution of math problem with life orientation [1].

The purpose is to identify the level of formation of key component of practical mathematical competencies in high school students with intellectual disabilities.

**Material and methods.** Targeted study of the level of formation of key components of practical math competence of students with intellectual disabilities was conducted in February - March 2017 on the basis of public institution of education "Auxiliary school № 26 of the city of Vitebsk". The total number attracted to the study of persons made up of 10 high school students. Studying the level of formation of key component of practical mathematical competence of students with intellectual disabilities was carried out in the following areas: knowledge of money and money concepts; perceptions about the economy; the level of formation of skills to solve math problems of a social nature.

To conduct the study, we developed a diagnostic complex tasks, which consisted of jobs and tasks of a social nature, based on the requirements of the program to basic, practical and functional components of the mathematical competence of students with intellectual disabilities.

**Results and their discussion.** A practical study of mathematical competencies in the framework of the base component pupils of the senior classes of auxiliary school showed that most students know and call the correct denominations of coins and bills: 70% of students coped with this task without mistakes, 30% of the subjects made a slight error. In a situation when it was necessary not only to determine the denomination banknotes, and call the mathematical translations of some units of money in other, older students with intellectual disabilities coped with the task only in 50% of cases. The subjects included in this group know that 1 ruble – 100 kopecks and 3 roubles – 300 cents. In the remaining 50% of the cases students with intellectual disabilities demonstrated a lack of minimum basic competence in this matter.

Learning skills to exchange coins for notes and Vice versa high school students with intellectual disabilities showed that 40% of the subjects cope with this task without errors, 50% can perform only one of the proposed transactions (the job part), 10% are unable to perform this task. For example, the subject Egor K., with the exchange of notes of 5 rubles, used two coins of 2 rubles.

The study of the practical component of mathematical competence was presented to the family practice – oriented mathematical tasks. Quantitative



analysis of the obtained results showed that only 10% of students in the senior classes of auxiliary schools coped true with all jobs and 20% were unable to correctly solve one to four tasks for 70% of the subjects was not available the decision of five to seven tasks. Qualitative analysis of the results showed that high school students with intellectual disabilities experience significant difficulties both at the stage of understanding a mathematical problem, finding a solution to the problem, and in the process of performing calculations. The presence in the proposed arithmetic tasks describe everyday situations related to financial literacy and the need to perform mathematical operations with money, has become an objective of significant difficulty for students in the study categories. So, with the task where it was necessary to determine how many bars can be bought for 5 USD, if one cheese is 53 kopecks. to have managed only 20% of high school students with intellectual disabilities.

With the solution of arithmetic problems on the definition of a more economical option, making a purchase, handled only 20% of high school students with intellectual disabilities. Other students are unable to qualitatively understand the problem, apply the household economic performance and take into account the fact of taking into account the cost of travel to the store and back.

Learning skills to calculate the remainder from a sum of money showed that 70% of the subjects make mistakes as related to the correctness of the calculations and the necessity of translation proposed monetary amounts in single units, only 30% of students completed the calculation without error, but needed a reminder on the transfer of components of arithmetic operations in a single unit

The study of the state of the functional component of practical mathematical competencies in high school students with intellectual disabilities revealed that only 10% of senior students of the 1st branch of the true coped with all the tasks, 20% of subjects made mistakes in one to four tasks, 70% of high school students with intellectual disabilities made mistakes in five to eight tasks.

Qualitative analysis of the results of the study the ability to calculate the cost of goods students with intellectual disabilities revealed that only 10% of subjects managed without errors with this task. 90% of students with intellectual disabilities have not coped with the task, and all of them refused to start solving the math problems. Significant difficulties caused tasks and assignments by students with intellectual disabilities to explore their abilities to save and make more profitable purchases, and determine unnecessary expenses. The majority of students with intellectual disabilities (from 60% to 100%) do not know what the savings are, which means committing more profitable purchases and don't realize the basic need of saving.

**Conclusion.** Thus, by results of research of level of formation of key components of the mathematical competence of students with intellectual disabilities can be concluded nesformirovannost all its components. Therefore, there is an objective need for correction and developing work with high school students with intellectual insufficiency in the formation of their practical mathematical competence as in mathematics lessons and in real-life situations.

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**THE EDUCATION OF HUMANITY IN CHILDREN OF THE SENIOR PRESCHOOL AGE IN THE PROCESS OF ACQUAINTANCE WITH THE WORKS OF FINE ARTS**

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Sociocultural transformations carried out in our country on the basis of humanization and democratization presuppose significant changes in the system of raising children of preschool age. There is a reassessment of former values, the content of public consciousness changes, which leads to a new understanding of the tasks of raising children to school from the standpoint of universal human values.

Humanity, according to K.V. Gavrilovets, is one of the most important universal norms of morality, without the formation of which there can be no question of elaborating more complex moral and civic qualities [2, p. 5].

The analysis of literary sources showed that most of the researchers examined this problem from different perspectives: the attitude of the child to adults, peers, children of different ages (RS. Bure, LN. Paramonova, RB. Styorkina, etc.); sympathy as the earliest form of manifestation of humanity in preschool children (VI. Kulchitskaya, GI Lyamina, Ya.Z. Neverovich, etc.) [1].

Education of humanity, as shown in the studies of VS. Mukhina, it is impossible without visual art, thanks to which the emotional-value, humanistic attitude to people develops, because "in the process of creativity the child feels pleasure from self-realization and at the same time realizes the need to evaluate other people who need him to feel even more joy from his work" [3, p. 23].

In the studies of NA. Vetlugina, TN. Doronova, T.S. Komarova, B.M. Nemenensky, E.A. Flerina, R.M. Chumichevoy and others proved that communication with works of fine art has cognitive value, helps development and perfection of feelings, actively contributes to the formation of aesthetic consciousness of the individual.

At the same time, in these studies, the problem of educating humanity in children of older preschool age is viewed to a greater extent against the background of a general review of the moral upbringing of the younger generation, and not as an independent object of research. Also in most studies, emphasis is placed on the education of humanity in children of primary school age and adolescence.

In this regard, pre-school education institutions have an acute need for scientifically based methodological recommendations for organizing the education of humanity in children of senior preschool age in the process of visual activity, as one of the leading activities of children.

Proceeding from the foregoing, the purpose of the research is the scientific and theoretical justification and methodological support of the process of educating the humanity of children of the senior preschool age when acquainted with works of fine art.

**Material and methods.** Material of our research is humanity, as the quality of the personality of children of the senior preschool age. The following research methods are distinguished: analysis of psychological, pedagogical, methodological literature on the research topic; observation; conversation; questioning; pedagogical experiment.

Experimental and experimental work was carried out on the basis of the Children's Child Development Center "Neposedy" No. 544 in Minsk ". It was attended by two groups of senior preschool children, parents and teachers of pre-school education.

**Results and their discussion.** In the course of experimental work, a method was tested that was based on the organization of pedagogical activity by the pedagogical worker, which is aimed at forming an intellectual component in children of the senior preschool age, as well as emotional susceptibility in the course of acquaintance with works of fine art. This work was carried out in two directions: the development of intellectual-cognitive and behavioral-volitional components of humanity. The presented directions contributed to the formation of a system of knowledge about the humane qualities of the individual, norms and rules of humane behavior; stimulating interest and forming a humane attitude to moral standards, etc.

Work with children of senior preschool age was planned taking into account: various forms (frontal work, individual work, teamwork); different types of children's visual activity and their combination (drawing, modeling, applique); non-traditional techniques, based on the already existing

knowledge and skills of children (leaf imprint, monotype, drawing with clay, kleksografiya, tearing paper, drawing with cotton buds, etc.).



In the course of the analysis it was found that the majority of children in the experimental group increased their rates according to the following criteria: representations and attitudes toward moral norms, the humanistic nature of empathy.

As a result of experimental work, it was possible to reduce the number of children with a low level of education of humanity.

**Conclusion.** The developed and tested methodology aimed at fostering humanity in children of the senior preschool age in the process of acquaintance with works of fine art has shown its effectiveness and effectiveness.

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## **THE STUDY OF PECULIARITIES OF DEVELOPMENT OF ORIENTATION IN TIME STUDENTS WITH INTELLECTUAL DISABILITIES**

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The establishment of a provisional orientation is one of the most complex and urgent problems, because the ability to perceive time is a unique property of the human psyche, playing a pivotal role in the processes of biological and social interaction with the outside world. The problem of time perception of children with intellectual disabilities engaged: L.V. Zankov,

I. Finkelstein, N.F. Kuz'mina-Syromyatnikova, M.N. Perova, U. Pumputis, B.I. Tsukanov, V.V. Ek etc. So, in numerous publications the Perova M.N. it is noted that the orientation in time and time representations in children with intellectual disabilities formed much later than normally developing children [1].

The purpose – studying of features of formation of temporary representations of the senior pupils with intellectual disabilities in math class.

**Material and methods.** A pilot study was conducted on the basis of public institution of education “Auxiliary school № 26 of Vitebsk” in October 2016. The total number attracted to the study of persons made up of 10 pupils with easy degree of intellectual insufficiency. Study of peculiarities of formation of temporary representations included the following areas: knowledge of mathematical terminology, measures the time correlation of the mathematical term with the appropriate numerical equivalent; performing arithmetic operations with different measures of time; the solution of practice – oriented tasks with measures of time; determining time by the clock, displaying and setting the clock time via verbal instructions; comparison of various measures of time.

To conduct the study was composed of a scan job based on the requirements of the curriculum in mathematics knowledge time concepts [2].

**Results and their discussion.** The senior pupils with easy degree of intellectual insufficiency marked by a low level of formation of ideas within the mathematical time. Many children do not take the conditions of the job without assistance, confuse "second", "minute", "hour", "day", which indicates a "blurring" time concepts, the lack of a clear structure, so do not know how to adequately show the time on the clock, confusing the hour and minute hands. Only 10% of students were able to correlate the names of the measures of time with their numeric expression. 60% of students correctly performed this task, and 30% partially fulfilled, because of inability to relate mathematical terms denoting measures of time with their numerical expression, significant difficulties have prompted the use of the relevant term by naming the designated number of measures of time. The greatest difficulty has caused the mathematical definition of "age" because it is associated with a greater degree of historical time, is rarely used in everyday life.

Analysis results of solving text math problems with practice – oriented content (the determination of the age of family members) showed the presence of certain difficulties in subjects with the age determination of the mathematical method. It should be noted that 20% of students with intellectual disabilities have coped with this job, 30% were partially completed, and 50% are unable to solve the problem. Qualitative analysis of the results of executing a given diagnostic task revealed that older students with intellectual disabilities do not understand the chronology of the age, many of the subjects not generated or "blurry" idea of the age.

Definition the ability to perform arithmetic operations on measures of time and skill, exhibiting a specified time on an analog clock. showed that 60% of subjects are unable to cope with the task. 40% of high school students performed a part of it. The majority of students with intellectual disabilities have experienced significant difficulties already at the stage of perception of user tasks. To identify typical difficulties when performing arithmetic operations with measures of time include: calculation errors, nedifferentsirovannost of the terms "hour" and "minute", performing addition and subtraction of different measures of time (e.g., hours to add minutes, the resulting arithmetic manner the amount of call hours). When displaying the correct time on the clock, the children confuse the hour and minute hands, or use only one of them; do not relate the concept of "hour" with the hour hand, the concept of "moment" – the minute hand sometimes set the time at random.

Significant difficulties have caused the setting on the dial of the time the second half of the day, the objective complexity of the task made the lack of dial numbers the time of day after 12 hours, the correct execution of this task is possible with the understanding of the Convention of labeling the data clock measures time.

It should be noted, only 20% of students were able to correctly compare the values, expressed in hours, minutes, day; transfer day in hours, the hours into minutes, etc. for adequate comparison of the proposed values. 40% of the subjects performed the task partially. A typical error was to compare mathematically comparable measures of time, for example, compared the days and hours, hours and minutes, paying attention only to the specified numeric value, made errors when comparing numeric values themselves could not determine which number is larger.

Given that in the modern world, in most cases, the use of electronic watches, we have offered high school students with intellectual disabilities the mission aimed to determine the ability to correlate the time shown on an analog clock with the corresponding analogue time on a digital clock. Analysis of the results showed that the students of auxiliary schools are also poorly oriented in time on a digital clock and an analog clock. Revealed typical features of this assignment were: the desire to do the job mechanically, search the numeric similarity of the readings on the clock.

**Conclusion.** Thus, high school students with intellectual disabilities there is an inadequate level of development of temporal representations according to the training program. Characterized by the formation of temporary representations include:

- mixing, not differentiation measures time;
- the complexity of the matching mathematical terms with the corresponding value of measures of time;
- the difficulty to solve practice – oriented tasks related to the definition of different time intervals;



- sugurnost of problems of formation of temporary representations of unformed skills for qualitative performance of mathematical operations;
- the difficulty of identifying time by the hour arrow, electronic clock, incompleteness of relevant practical skills;
- ignorance of the mathematical laws related to the measures of time.

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## **FORMATION OF MANUAL SKILLS IN CHILDREN WITH MODERATE INTELLECTUAL DISABILITIES**

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Based on works A.R. Luriya, O.S. Vinogradova's, A.R. Mahler and G.V. Tsikoto note that children with moderate intellectual insufficiency begin to seize the simplest skills of self-service much later. Even at the age of 8–10 years most of pupils of this category experience the expressed difficulties in undressing, clothing, washing of hands, toothbrushing, etc. [1].

Difficulties of children with moderate intellectual insufficiency when mastering labor skills speak not only violation of motor development. It is known that these children with great difficulty comprehend a task, can't often perform operation according to the simplest instruction and for imitation. N.P. Wiseman emphasizes that children of the considered category start performance of a task, without having understood his purpose, find it difficult to formulate the program of a task, reason of failures at his performance, to look for suitable words for the characteristic of elements of the set program; in the majority a case the trajectory of movements is carried out by them incorrectly. Insufficiency of self-checking is sharply expressed, even the help when performing a task not always leads to correction of a mistake [2].

Studying of opportunities of training in skills of manual skills of pupils with moderate intellectual insufficiency on a diagnostic basis was the purpose of our research.

**Material and methods.** Experimental study was carried out in November 2016 at the state educational institution "Auxiliary school № 26 of the city of Vitebsk". The subjects were students in Junior classes of the second Department of the school. In total, the experiment involved 10 students with a diagnosis of "mild intellectual disabilities". As methods of research used the methodology of the study of manual skills with the use of a special diagnostic card

(V.A. Shinkarenko). we studied the condition of the skill of paper folding, tearing thin paper along the fold, circle stencils, circle templates, cutting paper with scissors in a straight line and an arc, performing a running suture punctures on thin cardboard, gluing application details using tassels.

**Results and their discussion.** The results of the study demonstrated varying degrees of success mastering subjects from basic labour operations. Much less succeeded with scissors cutting paper along the arc (10% of self-performed tasks), the bending and folding of paper, the thin paper tearing along the fold, sewing the punctures (10% of self-performed tasks), while 50–60% of cases had been ineffective and the proposed children help.

The data, however, are not evidence of the objective difficulties of certain tasks for children with moderate intellectual disabilities. It is possible that the lessons of labor miscellaneous labor operations have been paid different attention. It is therefore important to analyze what were the specific difficulties faced by the subjects when performing the proposed tasks. So, when folding a sheet of paper the most difficult for children was a preliminary alignment of the parts. Not controlling their coincidence, the disciples were in a hurry to start Ironing the fold: 50% of children do not combined the corners or sides of the workpiece, even with assistance from the experimenter. Specific difficulties arise in children and when Ironing the crease line, only 50% of the students fulfilled it by yourself, 40% of pupils were not ironed a fold line and the nearest portion of the sheet, which led to the loss of the procurement of the required quality.

Unlike folding paper when it is tearing on the lines of the previously made bend the majority of children experienced difficulties that caused the need for assistance in the implementation are not separate, but all the major techniques and activities. Difficult subjects were the regulation of power and speed tearing of the sheet.

There were significant differences in the independence of the fulfillments of basic techniques and actions when you trace the stencil. The biggest challenge for them provided the location of the sheet of paper on the table colored side down (only 20% of subjects were able to complete this step independently). Common mistakes when contouring in a rational sequence was circled several times with a strong pressure of the pencil, resulting in tearing of the blank stencil; irrational contouring, which led to the presence of gaps in the resulting contour lines.

Much higher were the children when you trace the template. Thus, only 40% of subjects placed the sheet of paper colored side up, if you trace the stencil is 80%.

The greatest difficulty for children, when cutting the workpiece in a straight line called the technique of cutting: requirements for coordinated action is right (pinch shear blades) and the left (direction of the workpiece) with the active participation of self-control. Finding it difficult in meeting

operational techniques, many children didn't even pay attention to the marked line of cut. As a result, 40% of students did not fulfill the cut even with the provided assistance (deviation from intended line exceeded 3 cm).

Even more difficult for the subjects were cut along the arc (cutting circle). The greatest difficulties in performing this task caused the pinch with shear blades (bred widely, and cuts are a part adjacent to the axis of the hinge). None of the students could not perform this action independently, and only 40% of children are carried out with the help of the experimenter. Difficult was and turning the blank: 40% of children carried out this activity with the help of the experimenter, and 20% - independently.

The most successful students coped with the sticking applicative parts. All the children carried out this task: either by yourself or with help. For example, the adherence details of the left hand was performed in all children. More difficult was wiping the excess glue on the edges of the jars, spreading the adhesive composition and the pressing and Ironing the details.

Objectively difficult became the task of performing a running suture punctures on thin cardboard (100% of the subjects lost job), due to a number of factors: the multistage and the necessity of using accurate and differentiated movements and actions (for example, when threading a needle).

**Conclusion.** Thus, the results of the study showed that pupils in the second branch of the auxiliary school manual skills can be optimized on the basis of thorough diagnosis. The use of the diagnostic card allows you to measure the work methods and actions as relatively simple to specific children with moderate intellectual disabilities and more challenging. The resulting diagnostic data allow for differentiated and individual approach in the formation of manual skills in children of this category.

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**THE STUDY OF FEATURES OF DEVELOPMENT OF THINKING |  
IN CHILDREN OF PRESCHOOL AGE WITH INTELLECTUAL  
INSUFFICIENCY**

**A. Sorokina**

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In studies of Vekker L.M., Lyublinskoy A.A., Shif Zh.I. and others have accumulated considerable material for the study of the way of thinking of children with intellectual disabilities and normally developing children.

The solution of the mental problems of children with intellectual disabilities at an early stage causes considerable difficulties. These preschoolers visual-active thinking is characterized by lag at rate of development [1]. They have no active search for a solution, they often remain indifferent to the problem-solving process, even in cases where task - gaming. However, children of preschool age with intellectual insufficiency, which decided to complete the task, there is no representation neither about terms, nor about the means to achieve this problem, but only some orientation to the purpose [2].

The goal is the study of visual forms of thinking in preschool children with intellectual insufficiency.

**Material and methods.** A pilot study was conducted in October – November 2016 SEE "Special kindergarten № 1 of Vitebsk", SEE "Sanatorium nursery – garden № 72 city of Vitebsk." The experiment involved 10 preschoolers with intellectual disabilities in the age of 5-8 years (EG). The control group consisted of 10 normally developing preschoolers aged 4-5 years (KG). For ascertaining experiment we have selected a range of methodologies through which we identified the level of development of visual-figurative thinking: "Help to get the toy", "What's missing?", "Broken Cup", "Split picture", "Narrative pictures".

**Results and their discussion.** On the basis of the ascertaining experiment we have shown that preschoolers EGO is underdeveloped visual-figurative thinking. So, it was found that only 34% of the examined children formed visual creative thinking (perform tasks on spatial visualization level by the method of visual mapping), 13% of preschool children with intellectual disabilities formed by the visual - active thinking (perform tasks on visually-effective level by trial and error that not corresponds to the age standard indicators) and in 53% of the subjects not developed even visual - active thinking (can't do the job), leading to inappropriate actions with the diagnostic task and its fulfillment. KG was not identified preschoolers with a low level run diagnostic tasks. 63% of normally developing preschoolers the level of development of visual thinking fits the standard indicators, 37% of children in the control group completed the tasks on visually-effective level.

The most successful for preschoolers with intellectual disabilities was the implementation of the method "Split images", which allows executing tasks and on spatial visualization and visual-motor level (60%). However, the experiment revealed that some preschoolers with intellectual disabilities (30%) formed only visual-active thinking, as the fulfillment of methods "What is missing" and "Raven Test" proved impossible for them. Implementation of 30% of the test tasks "Split image" for visually-effective level also had specific features. The presentation of the split images in 2 pieces (vertical and horizontal incisions) have not caused trouble in drawing them up through trial and error, but the difficulties were caused by the picture of 3 parts. And, only after providing organizational support, the

job was done right. The greatest difficulties caused addition pictures, split on 2 diagonals. These examples demonstrates the difficulty of transfer by preschool children with intellectual insufficiency of a way to do the job on the new conditionality.

Qualitative analysis of the implementation of the children EG the diagnostic tasks showed significant difficulties in the formulation of cognitive objectives (violation of goal setting), planning its activities and implementing the current and final control.

In the process of conducting diagnostic techniques revealed that preschoolers with intellectual disabilities of different levels of development of evident forms of thinking, made specific to each group of errors when performing tasks. So, when you run jobs from the technique of "Split images" and "What's missing" 30% of preschoolers with intellectual disabilities executed tasks on visual-figurative level, however, the execution time of tasks of different subjects had a wide range. Typical mistakes when performing tasks from the test Ravena include: not accounting for subjects of the width and length of the stripes on the sample, the lack of analysis of the color of the background picture and images on it (their correlation), no correlation of the vertical and horizontal lines.

Thus, quantitative and qualitative analysis of the obtained results has allowed to identify 3 groups of preschoolers with intellectual disabilities:

1. High level (34% of subjects) – at this level were classified as children who have completed the job on spatial visualization level (by visual mapping). Almost all children assigned to this level, there was a period of orientation in the task. Based on elementwise comparison they immediately without unnecessary movements performed the task. Subjects this level was characterized by the ability to control their actions.

2. The average level (13% of the test) – performing tasks in the visual-motor level (trial and error). Stage orientation in children of this subgroup were virtually absent. The pre-school children with intellectual disabilities have been characterized by impulsiveness and a negative attitude to the diagnostic task. In children of the examined subgroups had low development of the analytic-synthetic activities of visual thinking. The success of the mental analysis of tasks visually perceive the subjects of this category depended on their complexity and the sequence of presentation.

3. Low level (53%) – inability to perform the job, significant underdevelopment even clearly – effective thinking. Preschoolers in this group did not solve the diagnostic tasks, even with the use of all envisaged types of assistance, and sometimes even refused to solve them. For the data characteristic of the subjects was the lack of cognitive interest to the required tasks, gross underdevelopment of the analytic-synthetic activities, active and dynamic side of thinking.



**Conclusion.** Thus, the level of development of evident forms of thinking of preschool children with intellectual insufficiency is significantly different from the level of development of this kind of thinking normally developing preschoolers, and is characterized by a qualitative originality: a violation of the analytic-synthetic activities, the specifics of the rate characteristics of mental activity, difficulties in setting mental goals of non-verbal tasks, inadequate development of the ability to plan their cognitive activities, exercise and routine monitoring of mental activity.

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**STUDY OF THE FORMATION OF ENVIRONMENTAL  
KNOWLEDGE IN JUNIOR SCHOOLCHILDREN WITH  
INTELLECTUAL DISABILITIES**

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The problem of environmental education for junior schoolchildren with intellectual disability was studied by scientists as B. P. Puzanov, S. V. Alexeev, L. V. Simonova, T. A. Babanova, Y. A. Barysheva, E. M. Kalinina, T.S. Zykova, E.N. Hoteeva, V. G. Krysko, T. V. Varenova, O.H. Seredinskaya, L. B. Baryaeva, O.P. Gavrilushkina, G.P. Samorukova, etc. The environmental education of auxiliary school students should be understood as a continuing process of education, training and correction of a schoolchild directed to formation of his ecological culture that will manifest itself in an emotional positive attitude to the nature, to the world around, to the responsible attitude to the health and the state of the environment (starting with everyday life), in observance of certain norms of behaviour, in a system of values.

O.H. Seredinskaya classifies as the main objectives of the environmental education of schoolchildren in this category the following:

1. Mastering systemic knowledge about the unity of nature and about the interaction of man and nature.
2. Acquaintance with environmental problems and ways of their solution.
3. Formation of a responsible attitude to the environment and human health on the basis of education of environmental consciousness, thinking and environmentally sound behaviour.
4. Development of the skills of different types of activities in nature and



development of the environmentally oriented interaction with nature.

5. Knowledge of ways to solve environmental problems that have arisen in the process of everyday life.

6. Accumulation of emotionally positive experience with nature by children with intellectual disability.

7. Development of cognitive interest to the world of nature [1].

The purpose is to reveal the features of the formation of ecological knowledge among younger schoolchildren with intellectual insufficiency.

**Material and methods.** The experimental research was conducted in March – April 2016 in the State Educational Institution “Auxiliary School No. 26 in Vitebsk”. 20 junior schoolchildren of the 1st department of the school took part in the research. A diagnostic interview consisting of 17 open-and-closed-type questionnaires was offered to each examinee individually. The questions consist sections: “perceptions of plants”; “perceptions of animals”; “perceptions of mushrooms”; “perceptions of nature protection”. The questions of the discussion were based on the content of the program “Man and the World” [2] and also were focused on the local history approach in the formation of environmental knowledge (V.V. Gladkaya, D.G. Levites, L.V. Mikhailovskaya, N.A. Vershinin, I.D. Zverev, T.G. Kalesnikova, O.H. Seredinskaya).

**Results and their discussion.** A qualitative analysis of the results showed that, in the “perceptions of plants” section, the greatest difficulty for schoolchildren with intellectual disability was the question of recognition painted plants. Not all of the plants children were able to find and remember the names (no one could fully cope with this task). It is easier for children to cope with closed-type tasks, when the right answers should be chosen from the proposed answers (45% of the total number of respondents answered correctly).

Only 5% of the schoolchildren coped with tasks of the “perceptions of animals” section. Only 10% of children could recognize animals on the picture and only one child could name migratory birds. Children with intellectual disability have a poor understanding of what animals live in our country. For example, Elena K., Yevgeny Z. and Sasha S., together with representatives of animals of our fauna, called a giraffe. Nastya B. named the elephant as animals of the Belarusian forests. Significant difficulties in schoolchildren with intellectual disability were caused by definition of an animal according to the description of the type of food. Only 10% of the test subjects coped with this task and were able to explain their choice. It should be noted that children incorrectly name animals. For example Nastya B. named a wild boar a sheep, a swan - a duck, a woodpecker – “knock-knock”.

The task to define in what places in the wood honey agarics appear and to choose the right option from the offered options was the most difficult for children in the “perceptions of mushrooms” section. Only 15% of junior school age children with intellectual disability were able to cope with the

task. The definition of poisonous mushrooms had also caused difficulties. In most cases, children find out a poisonous mushroom among edible mushrooms, but cannot remember what it's called, confuse the name, or describe its external characteristics. For example Anya S. describes a toadstool: "a little white ..."; Alexander P. pointing at the russula, says that it is a pale toadstool. An explanations of why poisonous mushrooms are so called causes difficulties. For example, Vitaly L. explains that "on the toadstool there are round such ... - they are poisonous", Katya L. explains that "the stomach can get sick".

Under the section "perceptions of nature protection" the test subjects' knowledge is more developed. 50% of schoolchildren with intellectual disability were able to cope with the tasks.

We also conducted a quantitative analysis of the environmental knowledge of junior school age children with intellectual disability in terms of degree of training (according to V.P. Simonov). The results are presented in the Table 1.

Table 1.  
Levels of environmental knowledge  
of junior schoolchildren with intellectual disability (%)

Level name	Section name			
	Perceptions of plants	Perceptions of animals	Perceptions of mushrooms	Perceptions of nature protection
“Distinction”	60%	90%	65%	40%
“Memorization”	25%	5%	20%	35%
“Comprehension”	10%	5%	10%	15%
“Use”	5%	0%	5%	10%
“Shift”	0%	0%	0%	0%

**Conclusion.** Thus, the results of the experimental research showed insufficient level of formation of environmental knowledge of junior schoolchildren with intellectual disability and a number of specific features of their formation. The obtained data will help to organize more effective correctional-developing work with junior school age children with intellectual disability in their environmental education.

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## **THEORETICAL AND APPLIED ASPECTS OF PHYSICAL CULTURE, SPORT AND TOURISM**

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### **THE ROLE OF PHYSICAL EDUCATION IN DEVELOPMENT, FORMATION AND IMPROVEMENT OF STUDENT PERSONALITY**

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Last century science has been developing very rapidly. Currently the amount of scientific knowledge doubles every 10 to 15 years. The production of knowledge in society is not self-sufficient, it is necessary for the maintenance and development of human life. It interacts with other types of cognitive activity, builds an unbreakable bond between them. Discoveries in one field lead to the formation of new knowledge in another, i.e. the main quality of science is to constantly generate the growth of new knowledge [1].

At the present stage of development of society, science affects all spheres of life. Of course, scientific discoveries do not bypass physical culture and sports. Development in this area arises from practical needs and regulates it in a special way. Intensive research is determined, first of all, by increased value of its public functions – educational, health, integrative, ideological. Physical conditions of the body plays a huge role in the implementation of industrial, social and cultural activities. Their implementation is directly dependent on motional capabilities of a human being.

Many scientific disciplines have become part of the system of special knowledge in the field of physical culture and sports: sports psychology, biochemistry, physiology. This gave impetus to the development of such separate disciplines like sports physiology, sports medicine, valeology, functional anatomy, biomechanics, biochemistry, etc. [2].

It must be noted that scientific discoveries in the field of technology has allowed everyone to become engaged in physical culture and sports regardless of geographic location, climate and body's physical condition. Medical research and development in physical culture and sports allow getting readings of functioning of individual organs or systems and the whole organism faster and more precise.

Nowadays, science is becoming more and more important and essential part of reality. Science has made a breakthrough in the field of physical culture and sports. However, we have to keep in mind that physical and mental health are the basis for everything.

The goal of the research is to study the role of physical education in formation of personality of a student.

**Material and methods.** The research involved 38 students of the Belarusian Trade and Economic University. During the research, a survey of female students was conducted, scientific- and methodological literature and internet sources on the research problem were studied. Survey results were analyzed and processed by mathematical statistics.

**Results and their discussion.** The educational process of health-improving orientation contributes to the gradual and consistent strengthening of health, strengthening of body's adaptive mechanisms, providing social, biological and psychological adaptation and as a consequence increased level of students' physical capacity.

The survey was conducted among students to determine the students' attitude to health, its functionality and the functioning of the organism in general.

Questions were open-ended to encourage elaboration. Students' survey showed that 14.1% of the students define their health as "excellent", 47.8% of the students identified their health as "good", 34.9% of the students believe that they have satisfactory health and 3.2% of the students identified their health as "bad". The largest share of responses accounts for the option "good". However, it is necessary to take into account the fact that self-assessment of one's own health is a subjective indicator.

In this reach, the respondents were asked to identify the most relevant risk factors contributing to the deterioration of health. The most popular answers were: "bad habits", "eating disorders", "violation of work and rest regime" and "insufficient physical activity".

According to students, the obstacle to an active lifestyle is: "laziness", "lack of time", "prevailing way of life in the family", "lifestyle of the immediate environment".

Human body is designed in a way that physical exertion makes it stronger, more enduring and able to resist external environmental influences. This is not always the case for psychological workload.

**Conclusion.** In the process of learning, undergraduate students must form a health-oriented mindset. Their preparation for future professional activities requires a lot of mental and physical efforts. Therefore, formation of a conscious attitude of students to their health, confidence in their abilities is an integral part of it. Practical experience is also acquired therein.

Science moves forward, however, only the preservation of health is more dependent on us.

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## ATTITUDE OF PEOPLE WITH MENTAL AND BEHAVIOURAL DISORDERS TO ENGAGING IN NORDIC WALKING

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A growing number of individuals with mental disabilities is marked all over the world. Psychiatric disorders are the second in order of importance cause of illness burden after cardiovascular diseases. According to the WHO projections mental disorders will have been inside the top five of diseases leading to director disability by 2020 [1, p 3]. Nowadays about 400 Clubhouses providing support to 50 000 mentally ill people are working in 34 countries of the world. A Clubhouse is a social service for people with mental disabilities. The model of it is described in the International Clubhouse standards and based on a well-ordered business day management, respect for the rights of the individual and the dignity of every person, observance of the principles of equality and mutual responsibility of members and staff the Clubhouse for the effectiveness of the rehabilitation process [2, p 9].

On February 1, 2017 a Clubhouses «Wings of Hope» began his activity in Vitebsk (Belarus). He united people with various mental and behavioural disorders (confusional insanity, depressive disorders). Among the activities carried out by this organization was planned a special program of systematic employment of Nordic walking, which we developed. We considered the potentialities of this form of physical activity as an effective means of solving problems of rehabilitation as well as strengthening physical and mental health. Special importance was attached to the correction of the psychoemotional state of those engaged.

Purpose – determine, with the help of questionnaires, the level of effectiveness of the introduction of Scandinavian walking for people with mental and behavioral disorders within the framework of the Clubhouse project.

**Material and methods.** Group involved in Nordic walking, consisted of 8 people ranging in age from 30 to 50 years. The classes were held on the plan which we have worked. After a month the sessions were conducted questionnaire. Quantitative data processing was performed using mathematical-statistical methods.

**Results and their discussion.** The absolute majority of the group members (seven of eight or 87,5%) answered that they liked the training.

In answer to the question “Whether you easily like sustain walking?” 62,5% of the participants answered “Yes”, 25% - “No” and 1 person (12,5%) - “Don’t know”.

At the same time all but participants (he remained indifferent) go to classes with pleasure and 75% of them feel “a surge of strength and energy” after them. All the members of the group (100%) say about improving their



mood. The effect of the positive psychoemotional attitude to the occupation of Nordic walking is confirmed by the desire 87,5% of them to purchase walking poles for Nordic walking for the purpose of further self-trainings, training and their friends and acquaintances to go in for this kind of activity.

Preliminary research results allow to consider the possibility of using Nordic walking in clubhouse conditions as a potential means for psychoemotional state correction for individuals with mental illness and for physical and mental health promotion as well.

**Conclusion.** The survey results showed a positive attitude of all the members of the clubhouse to Nordic walking classes. Walking are followed by mood improvement and a wish to continue training. Together with a group form classes effect and a physiological endorphins impact an mental state during physical exercise the conditions for conducting, classes play a certain role as well. The trainings were held in the open air on the route along the river bank in a picturesque area with a view of water, trees, stones. And it surely made a framework of factors calming the group members mind reflexively at a subconscious level.

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## **ASSESSMENT OF LEVEL OF PHYSICAL HEALTH OF THE STUDENTS DOING GYMNASTICS TAE BO**

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Despite continuous improvement of system of physical training in UVO, indicators of the state of health of students if to survey them as one of the most important criteria of quality of pedagogical process, remain still unresolved problem. In a number of researches it is shown that to the end of training in UVO indicators of health of students authentically decrease. These changes indicate the need of improvement of traditional system of physical training. In this regard the purpose of work is studying the influence of fitness training Tae bo on the level of physical health of medical students.

**Material and methods.** 90 students (girls) of the Vitebsk state Order of Friendship of the people of the medical university participated in a research. Middle age was 17,4 years. The research was conducted two times, at the beginning of academic year and at the end. Examinees were divided into two groups (control and experimental) 45 people in each group. Girls of the control



group (CG) were engaged in physical culture according to the training program on physical training of institutions of higher education (the training program "Physical culture" of UO "VGMU" No. UD 068/uch.). Students of the experimental group (EG) studied within the Applied Physical Culture module, at the rate of fitness training on the basis of exercises Tae bo ("Fitness training (Ty Bo)"No.UD-054/uch.).G.L. Apanasenko's technique was used for assessment of level of physical health of students [1]. Body weight, growth, vital capacity of lungs, brush dynamometry, frequency of cordial reduction, arterial blood pressure and time of restoration of pulse were defined by this technique.

**Results and their discussion.** At the beginning of academic year most of students in control group had the average level of health. By the end of academic year in this group the number of first-year students with the average level of health decreased, and it was enlarged with level below an average. In experimental group at the beginning of the first semester levels of physical health had the greatest number of students low (12,4%) and below an average (50%). It is necessary to notice that to the end of academic year in this group the percent of students with an average (from 18,8% to 50%) level was enlarged. At the end of the academic year in control group the indicator of body weight was enlarged by 4,5%, the indicator of vital capacity of lungs decreased by 3,1%, the level of a dynamometry of a brush decreased by 6,8%, the frequency of cordial reduction was enlarged by 6%, indicators time of restoration of pulse was enlarged by 20,5% (tab. 1).

Tab. 1 – assessment of the level of health by the end of the school year

Indicator	Control group n=45		Experimental group n=45	
	1 semester	2semester	1 semester	2 csemester
Body weight (kg)	55,4±5,3 ◀◀◀	57±8,1	58,5±8,5	59,3±9,9
Growth (sm)	164±0,05 ◀◀◀	165±5,4***	1,6±0,06○○○	1,6±6,5
DMK (kg)	29,3±3,1 ◀◀◀	27,3±4,1***	28,8±4,3○○○	26,9±4,3
FCR	78,7±4,3 ◀◀◀	83,96±12,3***	83,1±8,4○○○	86,5±12,8
ABP	115,47±6,7 ◀◀◀	114,3±9,4***	109,06±6,4○○○	109,8±8,1
TRP (sec.)	87,4±20,1 ◀◀◀	110,36±3,7***	112±36,7○○○	108±3,5

The note when comparing KG2 and EG2: ◀ - differences between groups are statistically significant at p<0,05; ◀◀ - differences between groups are statistically significant at p<0,01; ◀◀◀ - differences between groups are statistically significant at p< 0,001. The note when comparing KG1 and KG2: • - differences between groups are statistically significant at p<0,05; •• - differences between groups are statistically significant at p<0,01; ••• - differences between groups are statistically significant at p<lt;0,001. The note when comparing EG1 and EG2: ○ - differences between groups are statistically significant at p<0,05; ○○-differences between groups are statistically significant at p<0,01; ○○○ - differences between groups are statistically significant at p<0,001.

In experimental group an indicator of body weight was enlarged by 1,4%, the indicator of vital capacity of lungs decreased by 13,2%, the level of a dynamometry of a brush decreased by 6,8%, the frequency of cordial

reduction 4,6% were enlarged, indicators time of restoration of pulse decreased by 3,6%. Indicators of body height, arterial blood pressure in control and experimental groups didn't change. Thus, in both groups to the extremity of academic year deterioration practically in all indicators except for indicators of arterial blood pressure and a dynamometry of a brush is observed, but much more depression of indicators happens in control group.

**Conclusion.** The fitness training on the basis of exercises Tae bo is an effective remedy of rising on level of physical health of students and as a result of their adaptedness to training conditions in higher education institution.

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## **ANALYSIS OF SPORT AS A SOCIAL PHENOMENON IN MACROSOCIOLOGICAL PARADIGMS**

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Sociology as a science has a variety of theoretical-methodological approaches and methods of empirical research of its subject – social reality. Such a variety of approaches and methods makes it possible for researchers to completely examine and analyse objects of sociological study, in addition, such a variability substantially increases the general heuristic potential of sociological knowledge.

The aim was to represent possible variants of analysis of sport within macrosociology.

**Material and methods.** The diversity of sociological theories and approaches has a distinct line of demarcation based on the level of study of social phenomena. Proceeding from this point of view, macrosociology and microsociology are distinguished. Macrosociological theories emphasize the analysis of the functioning of the entire society, its structural elements, social institutions, social phenomena, and are associated with social realism. Microsociological approaches are used in the study of social interaction, small groups, and meanings that individuals give to their daily activities, which corresponds to social nominalism.

Sociology is a multiparadigm scientific discipline. The concept of “paradigm” was introduced in sociological discourse by the American researcher, sociologist T. Kuhn, in his book “The Structure of Scientific Revolutions” (1962). Macrosociological paradigms include structural-functional, Marxist, neo-Marxist, conflictological paradigms.

**Results and their discussion.** Structural functionalism is a paradigm, “based on the consideration of society as a system – an internally differentiated and ordered integrity, parts of which are structural elements that contribute to the maintenance of the system, to its reproduction” [1, p. 6]. Structural functionalism, it seems, has the greatest heuristic potential in the study of sport and physical culture. Complex analysis of this social phenomenon is possible within the framework of this approach by defining its structural elements and determining the inherent functions that they perform in society and thereby satisfy certain social needs.

The immediate predecessors of structural functionalism are the structural and functionalist approaches. The structural approach in social knowledge was formed in the 1920s and 1930s, such scientists and philosophers as K. Levi-Strauss, R. Bart, J. Lacan worked in its framework, its essence consists in revealing the structure as a set of relatively stable relations. Functionalist (functional) approach concentrates on considering the researched object as a whole with subsequent decomposition into elements. In the course of such analysis, the structural parts of social institutions are identified and their functions are determined. Among the researchers-functionalists it is worth noting U. Ogborn, H. Spencer, E. Durkheim, T. Parsons. In the context of the structural approach, sport can be considered as a definite structure with a number of constituent elements in it. In turn, the functionalist approach concentrates on considering the functions inherent in sport and physical culture.

A significant contribution to the development of the conflictological approach was made by L. Cozer, R. Darendorf, C. Boulding. The essential idea of the modern conflictological paradigm lies in the rejection of unambiguously negative interpretation of the conflict, social contradiction. This paradigm can treat sport as a specific type of social contradiction, as a conflict between participants based on their rivalry and struggle, often such a conflict has far greater consequences than simple sports struggle, healthy competition, because the competitive conflict of athletes or teams can be more deep conflict between sports schools or even countries.

The Marxist paradigm (historical materialism) regards modern society as “a system of relations based on the unequal distribution of economically significant resources among people whose life activity the given system organises and regulates. All relations in the system – economic, legal, political, religious, family and others are considered as forms of securing of inequality, domination of privileged categories of people and exploitation of the disadvantaged and discriminated” [1, p. 11]. In this paradigm, it is possible to consider the work activity of athletes, their performances, usually associated with maximum tension of physical and spiritual forces, as their exploitation by authoritative elites, by companies, which produce equipment, food for athletes, companies-advertisers, bookmakers (as well as bidders), etc. For instance, the authoritative elites always require better results both for maintaining the image of the state, this type of social structure, and as an

argument in relations with other states. Therefore, in this case, sport goes beyond the borders of competition and acts as an instrument of policy,

Critical theory of society (neo-Marxist paradigm) is an alternative to classical Marxism. This approach is “based on the concept of society as a system of total, all-pervasive control. Unlike classical Marxism, in neo-Marxism, control is not associated with direct coercion and exploitation by the ruling class, but with imperceptible transformation of natural human inclinations into “false” needs, the satisfaction of which does not lead to the free development of the individual, but to strengthening of the existing social order” [1, p. 16].

One of the variants for analysing sport and physical culture within the critical theory of society can be the consideration of the “false needs” that arise in athletes and people engaged in physical culture, such as buying special sports nutrition, equipment (various simulators), visiting gyms, paying specialized instructors / trainers. This is especially noticeable when considering physical culture and mass sport, since most of the exercises, which are necessary for the average individual, can be performed qualitatively even without specialized equipment, nutrition, instructors / trainers. A vivid example of the construction of a false need by manufacturers of sports nutrition is the now widespread image of a sporty, smart human (male or female). This image corresponds to certain standards of physical beauty and attractiveness that practically does not occur in the natural life of people, but for the creation of which it is necessary to buy special food, adhere to a certain diet. People seeking to match the ideal image, have different kinds of false needs for sports nutrition, simulators, equipment, trainers, etc.

**Conclusion.** Among the paradigms of macrosociological knowledge, the structural functionalism has the greatest heuristic potential in the study of sport and physical culture.

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## **PHYSICAL DEVELOPMENT AND FUNCTIONAL CONDITION OF STUDENTS WITH INTELLECTUAL DISABILITIES**

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Recent years, the impact of negative socio-economic, environmental, and genetic factors increases the number of children born with deviations in

development [1]. The influence of adverse factors is able to trigger symptoms of mental retardation.

Thus, it becomes relevant the study of the causes and conditions of mental retardation, methods of early diagnosis and correction. Special importance should be attached not only to the development of intellectual skills of a retarded child, but also the development of the psychoemotional sphere of the person and their physical health.

The degree of development of emotional sphere and physical health determine the child's readiness to come into contact with people, gain some experience, skills of self-control in behavior and communication. All of the above determines the relevance of diagnostics and correction of emotional disorders in mentally retarded children, physical fitness evaluation with a view to their more effective adaptation in society.

Research objective: theoretically to prove and experimentally to check up efficiency of method of development of physical health and mental processes of children with mental retardation by means of adaptive physical culture.

**Material and methods.** Researches were conducted to the children of faculty of physical culture (in an amount of 20 persons) in 2017 year on the base of GUO "Vspomogatelnaya school No. 26" of the city of Vitebsk. Children engaged in the lessons of physical culture according to the approved basic education curriculum in physical education in the gym and at the small stadium near the school. Children 11–17 years is determined by the medical commission in the basic and preparatory group to the extent of their mental deficiency.

Using techniques quantitative rapid assessment of physical health of children and adolescents, developed by G. L. Apanasenko, (2002), you can define the amount of physical reserves and the economization of functions of the growing organism. The basis of the proposed methodology is based on indicators anthropometry (height, body mass, vital capacity (VC), the compression force of the brush) as well as indicators of the function of the cardiovascular system (systolic and diastolic blood pressure heart rate reduction).

To assess the reserves of the body uses the indexes that are calculated using the aforementioned indicators. Criterion reserves and economization of functions of the cardiovascular system is the "double work" alone ( $HR * SD / 100\%$ ).

**Results and their discussion.** A basic method of diagnostic is the study and evaluation of their physical development and functional state of children and adolescents, and the extent of their mental deficiency. All indicators are ranked. They rated the score separately for boys and girls.

After receipt of each indicator is determined by the total amount of points the level of physical health:

- 5 points or less - the lowest level;



- 6-10 points – the middle level;
- 11-15 points - the high level.

We obtained the data availability in 60% of cases low level of physical health, with no significant differences in the groups of boys and girls. The middle level was diagnosed in 38% of investigated children and adolescents, and only 2% from high level of physical health, and only in boys older.

The proposed method allows one to identify "at risk" (average level) and in relation to them undertake complex health activities.

With regard to children and adolescents referred to the low level of health, we are more likely to talk about their chronic diseases. Students with medium and low levels of physical health need to deepen medicines complete.

When conducting training sessions, we conducted the selection of the optimal physical activity, gradually and systematically developing the physical qualities and positive effect on mental function.

In particular, the physical training was focused on the development of children, spower, which showed poor results. Strength exercises are an effective means of repair disadvantages such as stooped posture, sunken chest, underdeveloped muscles.

At children with the expressed forms of disturbances mental and motor spheres connected with them, and their consequences, disturbances of their mobility, pathological irradiation of excitatory and inhibitory processes, infringement of interaction of the first and second alarm systems.

These violations entail difficulties in the formation of new complex conditioned-reflex connections, inertia, lethargy, absent-mindedness, easy distraction and fatigue, a low level of working capacity of the organism, etc.

Violations of the functions of the musculoskeletal system can be both congenital and acquired character. Pathologies are noted in the form:

- disorders of muscle tone (spasticity, rigidity, hypotension, dystonia);
- restrictions or impossibility of arbitrary movements (paresis, paralysis);
- disorders of tonic and statokinetic reflexes;
- disorders of balance and coordination of movements (ataxia);
- disorders of the musculo-articular sensations (kinesthesia);
- deformations, asymmetries and curvatures of various parts of the skeleton with restriction or lack of movements in the joints, etc.

We have proposed exercise of the power of nature, namely: put the bar for children, flexions traightening the arms in the emphasis lying. In this set of exercises starred indicators of carpal dynamometry before the pedagogical experiment, which is planned to be held during the school year and the results to draw conclusions and to develop the best complexes of General developmental and special physical activity for pupels with intellectual insufficiency depending on its degree.

Significant changes are happening to the musculoskeletal system.



**Conclusion.** We considered the theoretical aspects of the development of physical health and mental function of children with mental retardation in conditions of special (correctional) educational institution and try to identify the level of development of physical health, mental processes and their relationship in children with mild mental retardation.

To develop and experimentally prove the effectiveness of methods of development of physical health and mental function of children with mental retardation by means of adaptive physical culture.

As we know from the scientific definition, the term "physical development" means the combination of morphological and functional properties of the organism, characterizing the process of growth and maturation. For the characteristics of the physical development used basic anthropometric characteristics, summarily reflect the plastic processes in the growing organism.

That's why physical development is one of the most important indicators of living conditions and upbringing of the younger generation and serves as an objective method of monitoring the effectiveness of its physical and even mental health. A basic method of diagnostics is the study and evaluation of their physical development and functional state of children, and the extent of their mental deficiency.

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## **ANALYSIS OF THE CONDITION OF MAIN INDICATORS OF HEALTHY LIFESTYLE OF STUDENTS**

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The life of modern man, and especially the student, is connected with big psychological and physical strain. The huge flow of information, negative emotions, stressful situations like in the classroom and in everyday life, lead to regular overfatigue, unbalance of the normal condition, disruption of metabolic processes, decrease general immunity.

Health is the main value of any person. Good rude health allows us to achieve many serious goals. A healthy lifestyle creates for a person such a sociocultural microenvironment, in the conditions of which real prerequisites arise for high creative self-giving, efficiency, labor and social activity, psychological comfort. Unfortunately the content of the lifestyle of the

majority of modern students, from the standpoint of healthy is unsolved pedagogical problem to solve which, as in Belarus and abroad, constantly going research [1, 2].

The purpose of the investigation is to conduct a quantitative and qualitative assessment of the component composition of the healthy lifestyle of students.

**Material and methods.** In investigation involved 45 first-year students (25 girls and 20 boys aged 17 to 18 years) studying at the Vitebsk State University named by P.M. Masherov. Observed for three months (September-November) kept a diary of self-monitoring of health [3], the content of which included a map of monthly registration of the dynamics of 15 basic indicators of a healthy lifestyle. Quantitative and qualitative assessment of the data was carried out using mathematical statistics.

**Results and their discussions.** The main indicators of a healthy lifestyle of students during the observed period (September-November) are presented in Table 1. The table (in %) presents the average values of the studied indicators, according to the data of three sections conducted at the end of each month.

Table 1 – The main indicators of a healthy lifestyle of students (September-November)

Indicators	Boys			Girls		
	+	±	–	+	±	–
1. Implementation morning exercises (physical exercises, running, etc.)	21,7%	31,7%	46,6%	28,5%	37,5%	40%
2. Doing Exercise in your free time for about an hour or more (all alone; in groups OFP, fitness; in sports sections; on simulators, etc.)	30%	18,3%	57,7%	14,7%	16%	69,3%
3. The use of alcoholic beverages	5%	10%	%	2,7%	9,3%	88%
4. Smoking	5%	10%	%	5,4%	8%	86,6%
5. Reading or watching programs about health	5%	18,4%	76,6%	14,7%	26,6%	58,7%
6. Holding the Internet in your free time, continuously for up to two hours or more	31,7	26,7%	41,6%	36%	30,7%	33,3%
7. A visit to the steam room, sauna	35%	0%	65%	9,3%	18,7%	72%
8. Taking a shower before going to sleep	70%	15%	15%	80%	18,7%	1,3%
9. Sleeping no more than 5-6 hours	43,3%	33,4%	23,3%	29,3%	48%	22,7%
10. Eating 1-2 times per day, feeling of hunger	20%	21,7%	58,3%	17,5%	40%	42,7%
11. The predominance of meals of fatty and (or) confectionery products	33,3%	26,7%	40%	40%	41,3%	18,7%
12. Receiving clean water at least 1.5 liters per day	70%	10%	20%	53,4%	28%	17,7%
13. Stay in the open air for at least 2 hours	51,6%	13,4%	35%	61,4%	18,6%	20%
14. The use of hallucinogenic, psychotropic, toxic and other similar substances	5%	0%	95%	0%	0%	100%
15. Bad mood, stress, depression, aggression	10%	36,7%	53,3%	10,7%	37,3%	52%

Designation: + constantly, almost daily, very often  
± sometimes, occasionally, rarely  
– no, absent, did not have

The Table 1 shows that many of the indicators considered by the absolute majority of students meet the criteria of a healthy lifestyle. В тоже время целый ряд из них, в том числе характеризующих отношение студентов к физической активности подтвердили наличие имеющих место здесь проблем. So, during the observed period only 21.7% of boys and 28.5% of girls were constantly attached to morning exercises. More than half of the students did not have physical exercises in their spare time. At 30% of boys and 14.7% of girls this indicator was constant in the component composition of their lifestyle during the observed period. Not fully available in the free time of the students turned out to be staying in the open air for a time corresponding to the criteria of a healthy lifestyle. Daily stay in the open air for more than two hours was absent in almost half of the students of both sexes. Approximately the same number of boys and girls had a nighttime sleep of no more than 5-6 hours (table 1).

**Conclusion.** Thus, the investigation showed that the most problematic indicators (out of 15 studied) in the life of most of the observed students, from the standpoint of a healthy lifestyle are associated with the attitude toward independent physical activity. Qualitative and quantitative characteristics of these indicators in the male and female in most cases are significantly different. Further investigation of negative indicators in the way of life of students, the establishment of cause and effect relations of their occurrence, will allow to determine the main ways and measures of their prevention, correction and elimination.

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**EVALUATION OF THE FUNCTIONAL STATE OF STUDENTS  
OF THE FACULTY OF PHYSICAL CULTURE AND SPORTS,  
RECEIVING ADDITIONAL MILITARY ACCOUNTING SPECIALTY**

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The functional state of the students is directly related to the training load. The pace of today's youth life and socio-economic conditions motivate young students to additional training at the military department in one of the military specialties. There is an increase in the total training load. The workload of a university student should be 36 hours per week. Receiving a military specialty increases this time, especially in the exam and pre-examination periods, when, in addition to preparing for the current classes, students have to prepare for the next test or examination. Self-preparation for the next exam increases the time for mental work up to 8–10 hours a day or more [1]. In the conditions of psychoemotional tension associated with the performance of educational activities, which requires special stress, responsibility and attention in conducting classes at the military department, there is the possibility of developing a state of fatigue and reduced efficiency [2]. It is shown that mental capacity is inseparable from the general functional state of the organism, in the normal state of which the maximum results of mental activity are possible [1].

The purpose of the study was to assess the functional state and reserves of the body of students receiving an additional military registration specialty with the help of the Omega-M software and hardware system.

**Material and methods.** 28 young men, students of the faculty of physical culture and sports, aged 18–20 years, were examined. Surveys were conducted after the main training sessions, during the military training session at 15–16 hours in an isolated room in the absence of extraneous stimuli in the sitting position. Registration of 300 cardiocycles was performed in the second standard electrocardiogram lead. The surveys were conducted with the assistance of the laboratory assistant of the department of TMFK and SM Petrovich Yu.A.

**Results and their discussion.** At rest, the average pulse rate in the students surveyed is  $68.6 \pm 8.4$  beats per minute.

When analyzing the histogram, the following data were obtained: the mode (Mo) –  $0.86 \pm 0.11$ , the mode amplitude (AMo) –  $27.1 \pm 5.6$ , the variation range (BP) –  $0.29 \pm 0.05$ , HRV – index –  $14.2 \pm 3.3$ .

Interesting indicators of the index of vegetative balance (IVR) are represented. IWR indicates the relationship between the activity of the sympathetic and parasympathetic parts of the autonomic nervous system. The increase in IWR indicates the prevalent influence of the sympathetic

department of the autonomic nervous system. In our case, it is  $98.4 \pm 33.6$ , which corresponds to the norm.

The indicator of the adequacy of regulatory processes (PAPD) reflects the correspondence between the activity of the parasympathetic part of the autonomic nervous system and the leading level of functioning of the sinus node, is  $32.4 \pm 9.4$ .

The vegetative index of rhythm allows to judge the vegetative balance, in our case –  $0.3 \pm 0.1$ .

The psychoemotional state of students is in the range of 61-80%, which is interpreted as good, activity is normal.

**Conclusion.** Thus, the initial functional state of the students of the Faculty of Physical Culture and Sports receiving additional military specialty, according to the data of the "Omega-M" PA, is within the bounds of "good" and corresponds to the normal values of indices of autonomic and central regulation, functional reserves of the organism, good psychoemotional state and the activity of regulatory systems.

Analysis of the survey data of students of the Faculty of Physical Culture and Sports, who receive additional military specialization, during the lesson allows us to draw conclusions:

1. Initial functional state of students according to PAK "Omega-M" corresponds to the evaluation "good", which indicates the normal state of regulatory systems and the absence of stress load.

2. The psychoemotional state of students is in the range of 61-80%, which is interpreted as good, activity is normal.

3. Students of the Faculty of Physical Culture and Sports, have a good functional state and level of adaptation, which allows them to receive additional military specialty without harming their health.

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Scientific publication

**THE YOUTH OF THE 21st CENTURY:  
EDUCATION, SCIENCE, INNOVATIONS**

Proceedings of IV International Conference  
for Students, Postgraduates and Young Scientists

Vitebsk, December 6, 2017

Technical editor	<i>G.V. Razboeva</i>
Computer design	<i>L.R. Zhigunova</i>

Signed to print .11.2017. Format 60x84 1/8. Offset paper.  
Conventional printed sheets 24,76. Published sheets 13,44. Circulation copies. Order .

Publisher and polygraphic processing – Educational Establishment  
“Vitebsk State P.M. Masherov University”.

State Registration Certificate as publisher, printer and distributor of editions  
№ 1/255 d/d 31.03.2014.

Printed by risograph of Educational Establishment  
“Vitebsk State P.M. Masherov University”.  
210038, Vitebsk, Moskovsky Prospekt, 33.