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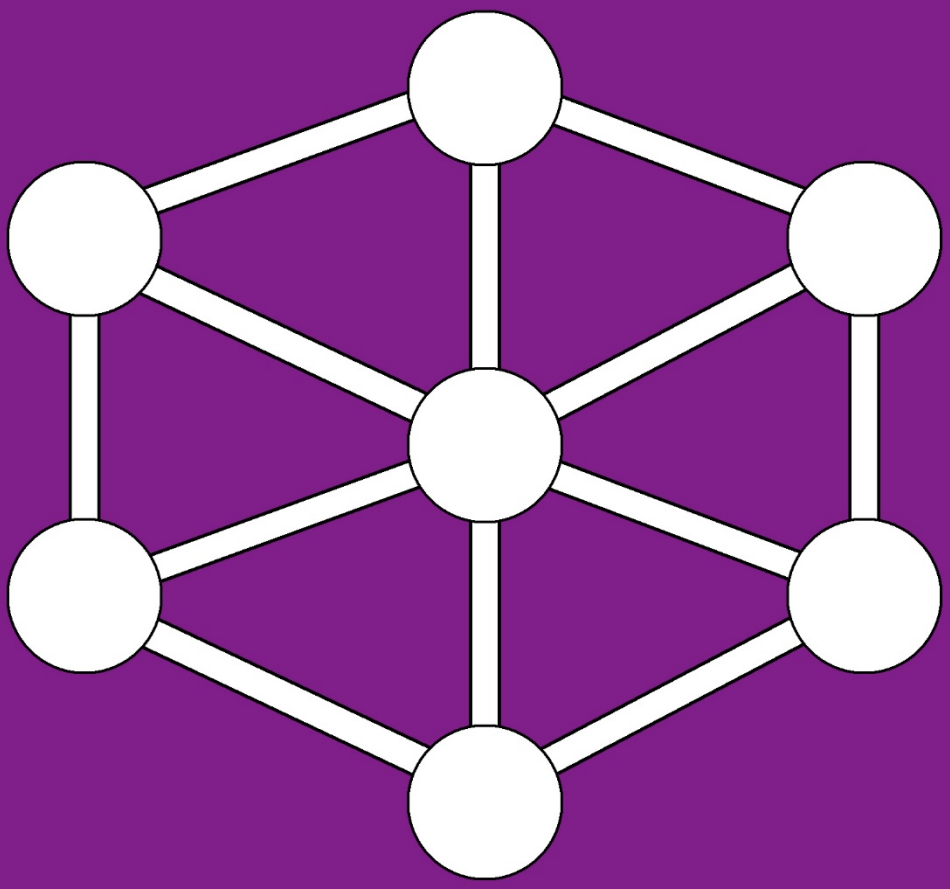

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Engineering of Bacterial Strain-Producer of Chimeric Protein Containing Human Annexin A5 and *Escherichia coli* Adenosine Deaminase

Keywords*: fusion protein, human annexin A5, adenosine deaminase, Escherichia coli, promising antitumor agent.*

Annotation. *Malignant tumors possess mechanisms allowing to evade degradation by immune system of the host organism. One of the mechanisms switches on in the tumor ummunosuppressing microenvironment triggered by extracellular adenosine. Earlier we proposed the idea to eliminate cancer protection barrier from host cell immunity using bacterial adenosine deaminase fused with human annexin A5. The conducted study resulted in the first development of strain Escherichia coli producing chimeric protein structurally composed of human annexin A5 and homologous adenosine deaminase. Generating capacity of the derived microbial strain with respect to chimeric protein was 18 mg/l cultural liquid. The protein content determined by polyacrylamide gel electrophoresis was about 7% of the total cellular proteins. The fusion protein is planned to be further studied as a promising antitumor agent.*

Introduction. In most countries of the world cancer diseases are regarded as the second worst reason of human mortality, lagging behind only cardiovascular pathologies (1). Current cancer therapy protocols envisage application of ray, chemical treatment and surgical intervention – separately or in combination. Radiation and surgery methods provide limited opportunities since they fail to cure metastases detected sometimes even at early stages of tumor development. Chemical drugs as a rule are unable to differentiate damaged and healthy cells, resulting in grave side effects.

A major latest breakthrough in oncological studies is detection of unique molecular targets specific for cancer cells. It spurred up development of target therapy – one of the most promising trends of tumor treatment. Such therapeutic strategy envisages application of preparations aimed at molecules synthesized exclusively by tumor cells (2).

Yet, clinical practice tends to reveal the failure of molecular target therapy as the means to combat cancer. The reason lies in extreme genetic heterogeneity of tumors. It seems there are no two identical cells in one tumor, to say nothing of the same cells in different tumors (3). It appears that neoplastic tissue is unique in each patient (4) so that appropriate targets for well-known therapeutic agents are not available in the majority of patients.

Thus, unsatisfactory results of current cancer treatment strategy evidence that conventional therapy protocols have reached the upper limit of efficiency and it is essential to seek new approaches to counter this disease (5).

In the updated version of hallmarks of cancer D. Hanahan and R.A. Weinberg (6) indicate that malignant tissues are encircled by specific ecological niche termed tumor microenvironment playing a vital role both in evolution of primary tumor and in metastasis process. It is generally recognized that such microenvironment serves as the barrier protecting neoplasm from antitumor attack by generating immunosuppressive phenotype in immunocytes (7).

Sufficient experimental findings collected to date allow to state that one of the key factors responsible for the formation of tumor microenvironment repressing cancerostatic immune response is accumulation of extracellular adenosine (8). Especially representative in this respect were the experiments of A. Ohta et al. (9), demonstrating the spontaneous rejection of grafted tumors in mice lacking adenosine receptors in contrast to wild-type mice showing no tumor regression.

We suggest to eliminate cancer shield from host immunity using adenosine deaminase fused with annexin A5 (termed otherwise annexin V) – human protein binding specifically with phosphatidylserine on the surface of tumor cells. In our opinion, the resulting chimeric protein introduced into the body of patients suffering from cancer diseases will bind with tumor cells and decompose adenosine protecting these cells from immune response.

This study was aimed at engineering of *Escherichia coli* strain producing protein made up by human annexin A5 and homologous adenosine deaminase (ADase).

Materials and methods. ADase gene *add* was derived from DNA of *E. coli* strain BL21(DE3) (Novagen, USA) by polymerase chain reaction (PCR). Annexin A5 gene *anxA5* was also isolated from plasmid pET12-PAPI (Addgene, USA) using PCR technique.

The structure of oligonucleotide primers (Primetech, Belarus) is presented below. Linker nucleotide sequence consisting of 18 base pairs was inserted into forward (*anx*-F) and reverse (*add*-R) primers (underlined).

Primers for annexin-A5 gene:
forward: 5'-GGCTCCGGTTCTGGATCCGCACAGGTTCTCAGAGGCA-3′;
reverse: 5'-GGTGATGGTGATGCTCGTCATCTTCTCCACAGAGCAG-3′.
Primers for ADase gene:
forward: 5'-GTGGTGGTCCACAACATGATTGATACCACCCTGC-3′;
reverse: 5'-GGATCCAGAACCGGAGCCCTTCGCGGCGACTTT-3′.

Plasmid pET42a (Invitrogen, USA) was linearized for further insertion of genes *add* and *anxA5*. Primers for linearization of plasmid pET42a:
forward (F) 5′-GAGCATCACCATCACCACCACCACTAATTG-3′;
reverse (R) 5′-GTTGTGGACCACCACCATATGTATATCTCCTTCTT-3′.

The plasmid and both genes were separately amplified by PCR technique and purified with the aid of commercial purification kit (Jena Bioscience, Germany). The obtained amplified fragments were annealed and amplified by circular polymerase extension cloning (CPEC) procedure (10). The method is based on elongation of overlapping vector and insert sequences, resulting in ring molecule comprising the required gene in plasmid structure.

To initiate CPEC 30 femtomoles of linearized vector pET42a and 30 femtomole aliquots of genes *add* and *anxA5* were supplied into reaction mixture. Amplification proceeded according to the following scheme: pre-denaturation stage (30 s at 98ºC) – 16 amplification cycles (10 s at 98ºC; 10 s at 55ºC; 4 min at 72ºC) – final 8 min elongation at 72ºC.

Integration of complementary regions to linearized plasmid pET42a into 5′ end of gene *add* and into 3′-end of gene *anxA5* provided conditions for assembly in the reaction mixture of genetic structure based on plasmid pET42a incorporating nucleotide sequence encoding chimeric protein designated as ADase-annexin.

The product of CPEC was used for transformation of competent cells of strain *E. coli* BL21(DE3), and as a result novel recombinant strain *E. coli* AA17 – the source of chimeric protein ADase-annexin was designed.

The transformed cells were cultured in Luria-Bertany liquid nutrient medium at 37°C to OD value 0.6 (λ=600 nm), then enzyme synthesis was induced by adding isopropyl β-D-thiogalactopyranoside (IPTG) (0.2 mM) into the medium, and the cultivation continued for 4 h. Upon sedimentation of bacterial cells by centrifugation the pellet was treated to recover chimeric protein ADase-annexin. Cell biomass was resuspended in buffer containing 300 mM NaCl, 10 mM imidazole, 50 mM NaH_2PO_4 (pH 8.0). Ultrasonic cell disintegration was conducted at Sonifier-450 unit (Branson, USA). Cell lysate was clarified by centrifuging and supernatant was applied on chromatographic column with Ni^{2+}-NTA-agarose (Qiagen, USA). Fractions containing the target chimeric protein were pooled and ADase activity was measured.

ADase activity was evaluated *via* adenosine deamination rate (11). Enzyme activity was assayed at the initial stage of the reaction when product yield did not exceed 10–15% of the maximum. Amount of enzyme sufficient for generation of inosine at the rate 1 μmol/min was defined as the unit of ADase activity.

Analysis of cell lysate protein composition and of purified chimeric protein was performed by electrophoresis in polyacrylamide gel with sodium dodecyl sulfate (SDS-PAGE). Protein molecular weights and expression of cloned genes were estimated using «ImageLab» software (BioRad, USA).

Protein content in the samples was determined by M. Bradford method. Bovine serum albumin served as the standard.

Results and discussion. At the first research stage gene *add* encoding ADase of *E. coli*, and gene *anxA5* responsible for synthesis of human annexin A5 were isolated by PCR technique from genomic bacterial DNA and plasmid pET12-PAPI, respectively, and then inserted into plasmid pET42a using the method of ligase-independent cloning, also known as circular polymerase extension cloning (CPEC). To restrain steric obstacles hindering normal functions of fused proteins they were linked by oligopeptide bridge consisting of 6 amino acids. Transformation of *E. coli* BL21(DE3) cells by CPEC product resulted in novel recombinant strain *E. coli* AA17 synthesizing chimeric protein ADase-annexin under control of strong phage T7 promoter.

Visualization of target protein production was achieved by SDS-polyacrylamide gel electrophoresis (Fig. 1).

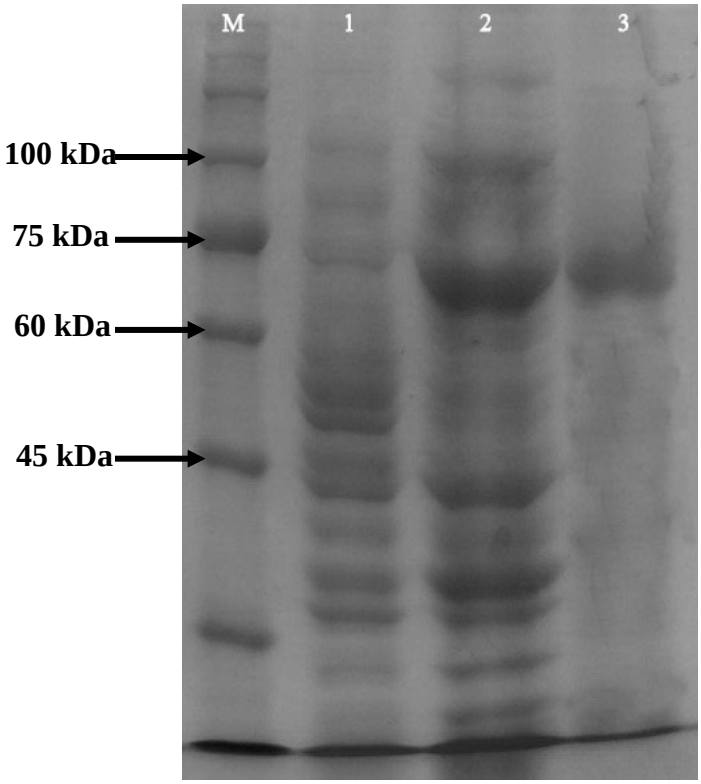

Fig. 1. SDS-PAGE image of fusion protein. (1) *E. coli* AA17 cell lysate before induction. (2) – Lysate after induction. (3) Purified fusion protein. M – protein molecular weight markers.

It may be seen from phoregram that the cells of engineered bacterial strain are able to generate protein product with molecular weight 73.8 kDa, accounting for about 7% of total soluble cellular protein. Such molecular mass is equivalent to the theoretical value calculated for chimeric structure composed of ADase (36.4 kDa), annexin A5 (35.9 kDa) and linker + histidine oligopeptides (1.5 kDa).

It was established in a series of experiments that the top level of chimeric protein accumulation in cells of strain *E. coli* AA17 was reached in 4 h following initiation of synthesis induction by 0.2 mM IPTG. Protein production capacity of the strain constituted approximately 18 mg/l of cultural liquid.

The following research stage was devoted to production of bacterial biomass and recovery of chimeric protein using metal-affinity chromatography. Analysis of gel electrophoresis data stated minimum 95% purity of biopreparation (Fig. 1).

ADase activity of chimeric protein was assayed via transformation rate of adenosine to inosine (11) in the course of the reaction schematically presented below:

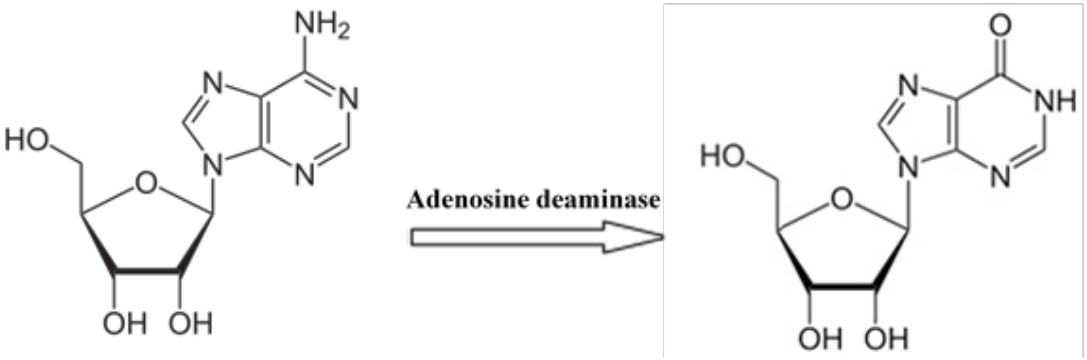

Fig. 2 reflects time-course of adenosine decay and inosine accumulation in the reaction mixture. Specific ADase activity evaluated from the experimental results equaled 458 units/mg protein. Enzyme-generating capacity of the strain constituted 7.1 units/ml cultural liquid.

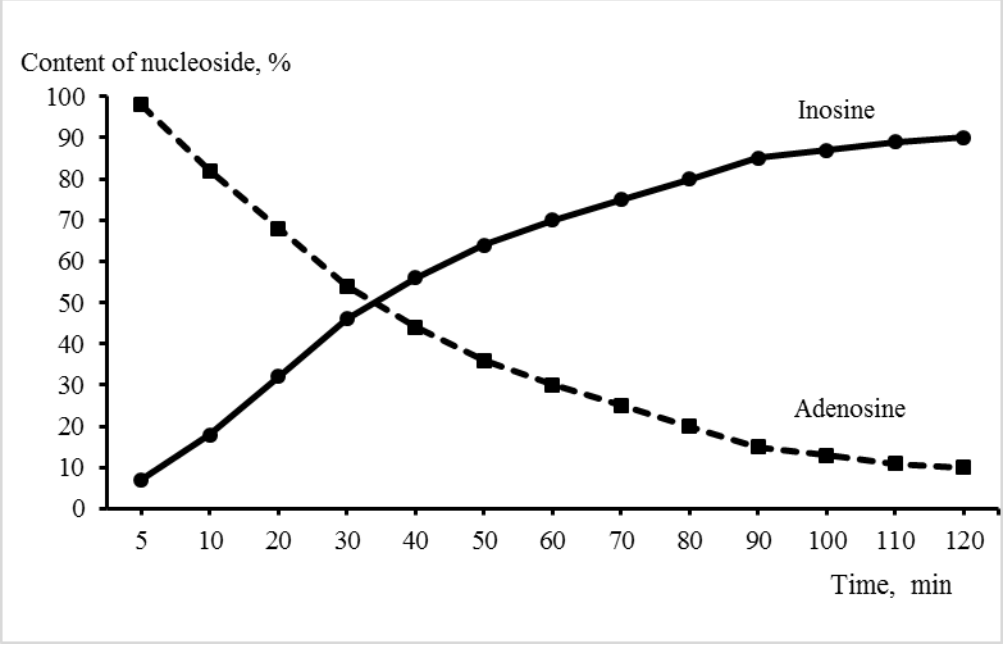

Fig. 2. Dynamics of adenosine decline and inosine accumulation in the reaction mixture.

While discussing the obtained findings it should be noted that several researchers specializing in the so-called enzymatic pro-drug cancer therapy have successfully synthesized a number of fusion proteins, namely human annexin A5 cross-linked with such enzymes as L-methioninase of *Pseudomonas putida* (12), cytosine deaminase of baker's yeast (13), purine nucleoside phosphorylase of *E. coli* (14), human β-glucuronidase (15) and cystathionase (16). It was shown that these chimeric annexin-based proteins (unlike carcinogenic) are not able to bind with normal cells.

Conclusion. Majority of nations worldwide, including Belarus are plagued by cancer holding the second place in disease incidence list, conceding the notorious championship only to cardiovascular pathologies. Unsatisfactory contemporary methods of cancer treatment substantiate the necessity to seek novel therapy approaches. The argument was postulated in literature that the emphasis in antitumor combat strategy must be focused on immune resources of the patient. However, the tumors possess protective mechanisms allowing them to avoid immune attack. One of the mechanisms sets up immunosuppressing microenvironment constructing a special molecular barrier between the tumor and immunity system of host organism. It is well known that the crucial role in formation of immunosuppressing microenvironment around solid tumors is played by extracellular adenosine massively produced in carcinomatous tissue. It binds with numerous adenosine receptors on immunocytes and blocks cellular antitumor response.

We propose the idea to overcome cancer defense against host immunity by means of adenosine-degrading enzyme fused with annexin A5 – protein showing affinity to phosphatidylserine localized on the surface of tumor cells.

Once introduced into the body of oncological patient, this chimeric protein is likely to adhere exclusively to cancer cells and decompose adenosine saving them from host immune control. In our opinion such drug distinguished by a broad spectrum of action and safety will not provoke selection of resistant tumor cells.

The performed investigation resulted in new recombinant strain *E. coli* AA17, producing the chimeric protein of afore-mentioned structure with molecular weight 73.8 kDa (equivalent to theoretically calculated value). The processed 1 liter of cultural liquid yielded 19 mg of purified protein capable to transform actively adenosine into inosine.

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Mathematics and engineering sciences

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Investigation into the Stape Gate without the inverted Sprue

Key words: *pouring basin, sprue, collector, feeder, head, resistance coefficient, expence coefficient, stream speed, consumption of liquid.*

Annotation: *The description of laboratory stape gate is provided. Results of theoretical and experimental determination by discharge fluid out of feeders from above and during filling under the flooding level. By calculation in the sprue forms vacuum which measures with piesometer-vacuometer. By work three feeders by discharge fluid out of feeders from above the water from third underneath not flows on calculation and experiment although level water in pouring basin higher upon 499.5 mm of center opening this feeder but the sprue is completely fluid. Calculation of filling under the flooding level uses individuality for each volume between feeders. Uses conception "extimated head" and relatins of the stream speed considers the method of successive approaching. Is installs what part volume of form fills from each feeder. A good agreement between the calculated and experimental data is presented.*

Introduction

Earlier, a longline *stape gate* (SG) with a back riser was investigated (1-4). However, in the foundry industry, longline medicines without a reverse riser are widely used (5-7). Calculation of such systems is not amenable, and there is very little experimental research. The present work is devoted to the development of a methodology for calculating such systems and its experimental verification.

Research Methodology

The longline stape gate is shown in Fig. 1 and 2. The system consists of a gating bowl 1, a nozzle 2, a riser 3, four feeders 4, a piezometer-vacuum gauge 5, a casting mold 6. To observe the process in the riser 3, there is a through hole that is sealed with transparent tape 7. The diameter of the sprue bowl Is 272 mm. The liquid level H - the vertical distance from the section *1-1* in the bowl to the horizontal axis of the feeder I - was maintained by a constant way of continuously pouring water into the bowl and draining its excess through a special gap in the bowl: $H = 0{,}7375\,\text{m}$. The work of the drug was investigated for casting without shape (Figure 1.) and with the form (Figure 2.) The time of the liquid outflow from each feeder was 50-250 s - depending on the number of simultaneously operating feeders, and the volume of water pouring from the feeder - about 8 liters. These time and weight limitations provided a deviation from the mean velocity value $\pm 0{,}005\,\text{m/s}$. The flow rate from each feeder was determined at least 6 times.

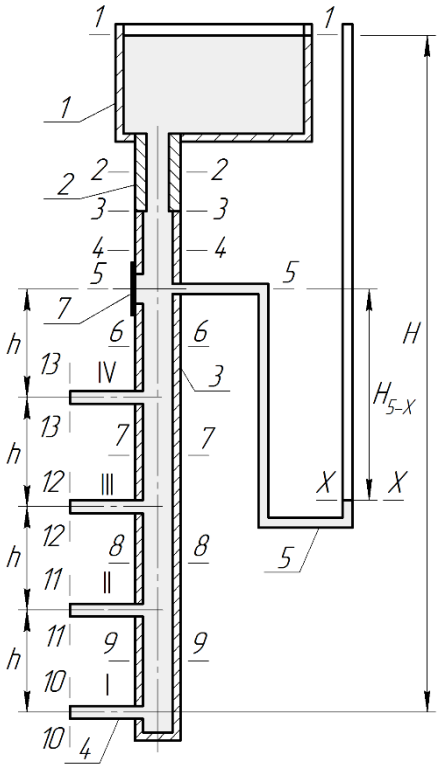

Fig. 1. A longline stape gate with moldless filling

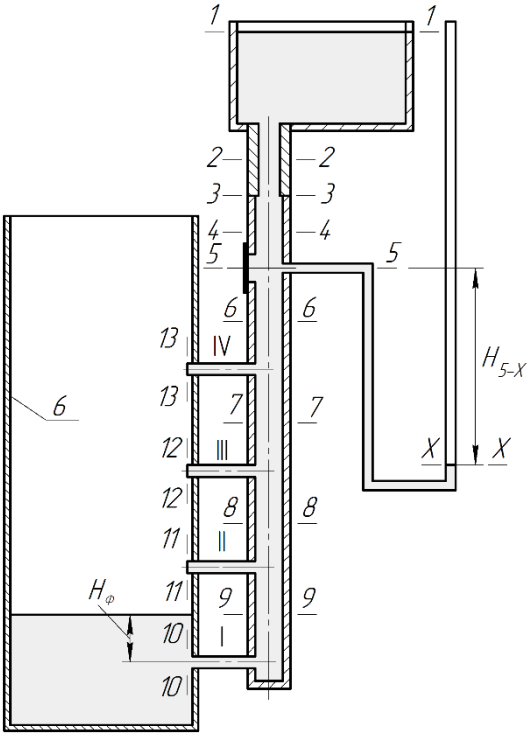

Fig. 2. A longline stape gate with a form

Main Body

We calculate the outflow of liquid from only one feeder I in the absence of a mold. We formulate the Bernoulli equation (BE) for sections *1-1* and *10-10*:

$$H = \alpha \frac{v_{10}^2}{2g} + h_{1-10},$$

(1)

where α - is the coefficient of unevenness of the velocity distribution over the flow cross-section (Coriolis coefficient); we accept α =1,1 *(8, p. 108)*; g - is acceleration of gravity; $g = 9{,}81$ м/s^2; v_{10} – is speed of metal in section *10-10*, m/s; h_{1-10} – is loss of head when the fluid moves from section 1-*1* to section *10-10*, m. These head losses

$$h_{1-10} = \left(\zeta_н + \lambda \frac{l_н}{d_н}\right)\alpha \frac{v_2^2}{2g} + \left(\zeta_p + \lambda \frac{l_{cm}}{d_{cm}}\right)\alpha \frac{v_4^2}{2g} + \left(\zeta_n + \lambda \frac{l_n}{d_n}\right)\alpha \frac{v_{10}^2}{2g},$$

(2)

where $\zeta_н$, ζ_p and ζ_n – are coefficients of local resistance of the entrance of metal from the bowl to the nozzles, to a sharp expansion of the flow when passing from section *2-2* to section *4-4* and to turn from riser to feeder I; v_2 and v_4 – fluid velocities in sections *2-2* and *4-4*, m/s; $v_4 = v_5 = v_6 = v_7 = v_8 = v_9$; $l_н$ – length of nozzle, m; l_{cm} – length (height) of the riser, m; $d_н$, d_{cm} and d_n – hydraulic diameters of nozzle, riser and feeder I, m; λ – coefficient of friction loss; l_n – feeder length I, m.

The flow rate in SG liquids during discharge from above is determined by the speed of the metal in the outlet section of *10-10* feeders I and its S_n cross-sectional area: $Q = v_{10}S_n$. The remaining fluid velocities in the SG channels are determined from the equation of continuity of the flow:

$$Q = v_2 S_н = v_4 S_{cm} = v_9 S_{cm} = v_{10} S_n, \qquad (3)$$

where $S_н$, S_{cm} – are areas of sections of the nozzle and riser, m2. We express all the velocities of the metal in (2) in terms of the velocity v_{10}, using the equation of continuity of the flow (3):

$$h_{1-10(10)} = \alpha \frac{v_{10}^2}{2g}\left[\left(\zeta_н + \lambda \frac{l_н}{d_н}\right)\left(\frac{S_n}{S_н}\right)^2 + \left(\zeta_p + \lambda \frac{l_{cm}}{d_{cm}}\right)\left(\frac{S_n}{S_{cm}}\right)^2 + \zeta_n + \lambda \frac{l_n}{d_n}\right].$$

(4)

The expression in square brackets is denoted as $\zeta_{1-10(10)}$ – coefficient of resistance of the system from section *1-1* to section *10-10*, reduced to the fluid velocity in the section *10-10*:

$$\zeta_{1-10(10)} = \left[\left(\zeta_н + \lambda \frac{l_н}{d_н} \right) \left(\frac{S_n}{S_н} \right)^2 + \left(\zeta_p + \lambda \frac{l_{cm}}{d_{cm}} \right) \left(\frac{S_n}{S_{cm}} \right)^2 + \zeta_n + \lambda \frac{l_n}{d_n} \right]. \quad (5)$$

Now (1) can be written as:

$$H = \alpha v_{10}^2 (1 + \zeta_{1-10(10)}) / 2g. \quad (6)$$

A coefficient of flow of the system from section *1-1* to section *10-10*, reduced to the speed v_{10} ,

$$\mu_{1-10(10)} = \left(1 + \zeta_{1-10(10)}\right)^{-1/2}. \quad (7)$$

Speed

$$v_{10} = \mu_{1-10(10)} \sqrt{2gH / \alpha}. \quad (8)$$

We find the consumption *Q* by expression (3). Diameters of nozzle, riser and feeder (mm): $d_н = 9{,}03$, $d_{cm} = 20{,}08$, $d_n = 9{,}03$. The ratio of areas $S_н : S_{cm} : S_n = 1 : 4{,}945 : 1$. Feeder length is $l_n = 0{,}0495$ m. We assume, as in *(9, 10)*, that the friction loss coefficient $\lambda = 0{,}03$. The coefficient of local resistance of the entrance from the bowl to the nozzles, depending on the radius of the rounding of the entrance edge, is determined by reference *(11, p. 126)*: $\zeta_н = 0{,}12$. The coefficient of resistance to a sharp expansion of the flux ζ_p is found from the following relation *(8, p. 187)*: $\zeta_p = \left(S_{cm} / S_н - 1\right)^2$. $\zeta_p = 15{,}562$. Coefficient of local resistance of turning on 90˚ from standing in the feeder (with change of the areas of sections before and after turn) $\zeta_n = 0{,}303$ *(12)*. The results of calculations using the relations (5), (7), (8) and (3): $\zeta_{1-10(10)} = 1{,}429006$, $\mu_{1-10(10)} = 0{,}641631$, $v_{10} = 2{,}327126$ m/s, $Q_{10} = 149{,}033979 \cdot 10^{-6}$ m^3/s.

Characteristics of II-IV feeders are calculated similarly with the following amendments. When the feeder II, III or IV operates in the expression (8), instead of H, there should be $H - h$, $H - 2h$ and $H - 3h$, where h –is vertical distance between the feeders $h = 0{,}119$ м. The results of calculations and experiments (in the denominator) are given in Table. 1. $Q^* = 100\left(Q - Q_э\right) / Q_э$, %. As can be seen, the theoretical values of expenditures are less than the experimental ones by the value from -1.8% to -1.2%.

Table 1. The characteristics of the gating system when a single feeder or nozzle.

Indicators	Working feeders				
	I	II	III	IV	N^{**}
ζ	1,429	1,422	1,414	1,407	0,289

μ	0,642	0,643	0,644	0,645	0,881
v, м/с	2,327 / 2,37	2,134 / 2,17	1,921 / 1,95	1,679 / 1,70	1,457 / 1,48
Q, см^3/с	149,03 / 151,78	136,69 / 138,97	123,02 / 124,88	107,53 / 108,87	93,32 / 94,78
Q^*, %	–1,8	–1,6	–1,5	–1,2	–1,5
H_5, мм	−39,0 / −30,5	8,0 / 14,5	55,2 / 60,5	102,7 / 104,5	

**) Characteristics of the system consisting of a sprue bowl and nozzle

We find the consumption of metal in the LS during the operation of feeders I and II. We compile the UB for sections *1-1* and *11-11* of the feeder II($v_4 = v_5 = v_6 = v_7 = v_8 > v_9$):

$$H - h = \left(\zeta_н + \lambda\frac{l_н}{d_н}\right)\alpha\frac{v_2^2}{2g} + \left(\zeta_p + \lambda\frac{l_{cm}-h}{d_{cm}}\right)\alpha\frac{v_4^2}{2g} + \left(\zeta_{11} + \lambda\frac{l_n}{d_n}+1\right)\alpha\frac{v_{11}^2}{2g}, \quad (9)$$

and for sections *1-1* and *10-10* of feeder I:

$$H = \left(\zeta_н + \lambda\frac{l_н}{d_н}\right)\alpha\frac{v_2^2}{2g} + \left(\zeta_p + \lambda\frac{l_{cm}-h}{d_{cm}}\right)\alpha\frac{v_4^2}{2g} + \left(\zeta_9 + \lambda\frac{h}{d_{cm}}\right)\alpha\frac{v_9^2}{2g} + \left(\zeta_n + \lambda\frac{l_n}{d_n}+1\right)\alpha\frac{v_{10}^2}{2g}, \quad (10)$$

where ζ_{11} – is coefficient of resistance to the branching of part of the flow from the riser section *8-8* to the feeder II with the output section *11-11*; ζ_9 – coefficient of resistance to the passage of fluid from section *8-8* to section *9-9* when a part of the flow branches into the feeder II. The coefficients of resistance due to the separation of the flow from the riser will be calculated from the formulas for tees *(13, p. 112-11)*. Coefficient of resistance to the passage in the riser when a part of the flow branches into the feeder

$$\zeta_{np} = 0{,}4\left(1 - v_{np}/v\right)^2 / \left(v_{np}/v\right)^2, \quad (11)$$

and the coefficient of resistance to the branching of part of the flow into the feeder

$$\zeta_{отв} = \left[1 + \tau\left(v_n/v\right)^2\right] / \left(v_n/v\right)^2, \quad (12)$$

where v and v_{np} – are speed of metal in the riser before and after branching part of the flow into the feeder, m/s; v_n – fluid velocity in the feeder, m/s; τ – coefficient. For our case $\tau = 0{,}15$ *(14)*. The coefficient ζ_{np} is obtained reduced to the speed of the passing flow v_{np}, and $\zeta_{отв}$ – to the speed in the feeder v_n. As can be seen, the coefficients ζ_{np} and $\zeta_{отв}$ depend on the ratio of velocities v_{np}/v and v_n/v (more precisely, on v_9/v_8 and v_{11}/v_8), which are also unknown.

We introduce the following notation: $x = v_{11} / v_{10}$. Consumption in the system $Q = v_8 S_{cm} = (v_{11} + v_{10}) S_n = (x \cdot v_{10} + v_{10}) S_n = v_{10}(x+1) S_n = v_{10} S_{np(10)}$, where $S_{np(10)} = (x+1) S_n$ – reduced to the speed v_{10} – the area of feeders.

$Q = v_8 S_{cm} = (v_{10} + v_{11}) S_n = (v_{11} / x + v_{11}) S_n = v_{11}(1/x+1) S_n = v_{11} S_n$. Here $S_{np(11)} = (1/x+1) S_n$ — reduced to the speed v_{11} – the area of feeders.

Then $v_2 = v_{10} S_{np(10)} / S_н = v_{11} S_{np(11)} / S_н$, $v_4 = v_8 = v_{10} S_{np(10)} / S_{cm} = v_{11} S_{np(11)} / S_{cm}$, a $v_9 = v_{10} S_n / S_{cm}$.

We should set the value *x*. To begin with, let's take $x = 1$. . In this case $S_{np(10)} = S_{np(11)} = 2S_n$.

We should also find v_{11} / v_8 and v_9 / v_8. $\frac{v_{11} S_n}{v_8 S_{cm}} = \frac{v_{11} S_n}{v_{11}(1/x+1) S_n}$, $\frac{v_{11}}{v_8} = \frac{S_{cm}}{(1/x+1) S_n}$ – is relation v_n / v according to (12). We find that $v_{11} / v_8 = 2{,}472418$, and $\zeta_{11} = 0{,}313590$.

$\frac{v_9 S_{cm}}{v_8 S_{cm}} = \frac{v_{10} S_n}{v_{10}(x+1) S_n} = \frac{1}{x+1}$, $\frac{v_9}{v_8} = \frac{1}{x+1}$ – is v_{np} / v in formula (11). We define: $v_9 / v_8 = 0{,}5$, $\zeta_9 = 0{,}4$.

Now equations (9) and (10) can be written as follows:

$$H - h = \alpha \frac{v_{11}^2}{2g} \left[\left(\zeta_н + \lambda \frac{l_н}{d_н} \right) \left(\frac{S_{np(11)}}{S_н} \right)^2 + \left(\zeta_p + \lambda \frac{l_{cm} - h}{d_{cm}} \right) \left(\frac{S_{np(11)}}{S_{cm}} \right)^2 + \zeta_{11} + \lambda \frac{l_n}{d_n} + 1 \right],$$

$$H = \alpha \frac{v_{10}^2}{2g} \left[\left(\zeta_н + \lambda \frac{l_н}{d_н} \right) \left(\frac{S_{np(10)}}{S_н} \right)^2 + \left(\zeta_p + \lambda \frac{l_{cm} - h}{d_{cm}} \right) \left(\frac{S_{np(10)}}{S_{cm}} \right)^2 + \left(\zeta_9 + \lambda \frac{h}{d_{cm}} \right) \left(\frac{S_n}{S_{cm}} \right)^2 + \zeta_n + \lambda \frac{l_n}{d_n} + 1 \right]$$

Expressions in square brackets are the coefficients of resistance $\zeta_{1-11(11)}$ and $\zeta_{1-10(10)}$. Define: $\zeta_{1-10(10)} = 4{,}308213$, $\mu_{1-10(10)} = 0{,}434036$, $\zeta_{1-11(11)} = 4{,}295172$, $\mu_{1-11(11)} = 0{,}434570$. By (8) we find that $v_{10} = 1{,}574200$ m/s, $v_{11} = 1{,}443388$ m/s (for $H - h$). The ratio of velocities $x = v_{11} / v_{10} = 0{,}916902$. And we defined $x = 1$. We make the following approximation - $x = 0{,}916902$, repeat the calculation and get: $x = 0{,}859984$. By means of similar approximations for given $x = 0{,}859984$ we find: $x = 0{,}7144567$. On this, the calculation of the value can be completed, since the resulting value differs from the given value by only 0.0000003. We accept $v_{11} = 0{,}714457 v_{10}$. The reduced area of feeders: $S_{np(10)} = 1{,}714457 S_n$, $S_{np(11)} = 2{,}399664 S_n$. The remaining results are shown in Table 2. We calculate the operation of feeders I and III, I and IV, II and III, II and IV, III and IV in the same way, see Table. 2. It can be seen that the theoretical values of expenditures are less than the experimental ones by the value from -2.8% to -2.1%.

With the operation of feeders I, II and III with output cross-sections *10-10, 11-11* and *12-12*, the Bernoulli equations will be written in the following form:

$$H = \left(\zeta_н + \lambda\frac{l_н}{d_н}\right)\alpha\frac{v_2^2}{2g} + \left(\zeta_p + \lambda\frac{l_{cm}-2h}{d_{cm}}\right)\alpha\frac{v_4^2}{2g} + \left(\zeta_8 + \lambda\frac{h}{d_{cm}}\right)\alpha\frac{v_8^2}{2g} +$$

$$\left(\zeta_9 + \lambda\frac{h}{d_{cm}}\right)\alpha\frac{v_9^2}{2g} + \left(\zeta_n + \lambda\frac{l_n}{d_n} + 1\right)\alpha\frac{v_{10}^2}{2g},$$

(13)

$$H - h = \left(\zeta_н + \lambda\frac{l_н}{d_н}\right)\alpha\frac{v_2^2}{2g} + \left(\zeta_p + \lambda\frac{l_{cm}-2h}{d_{cm}}\right)\alpha\frac{v_4^2}{2g} + \left(\zeta_8 + \lambda\frac{h}{d_{cm}}\right)\alpha\frac{v_8^2}{2g} + \left(\zeta_{11} + \lambda\frac{l_n}{d_n} + 1\right)\alpha\frac{v_{11}^2}{2g},$$

(14)

$$H - 2h = \left(\zeta_н + \lambda\frac{l_н}{d_н}\right)\alpha\frac{v_2^2}{2g} + \left(\zeta_p + \lambda\frac{l_{cm}-2h}{d_{cm}}\right)\alpha\frac{v_4^2}{2g} + \left(\zeta_{12} + \lambda\frac{l_n}{d_n} + 1\right)\alpha\frac{v_{12}^2}{2g},$$

(15)

Table 2. The characteristics of the gating system for the operation of two feeders.

Working feeders	I, II	I, III	I, IV	II, III	II, IV	III, IV
$\zeta_{1-10(10)}$	3,288	2,491	1,846			
$\mu_{1-10(10)}$	0,483	0,535	0,593			
v_{10}, м/с	1,751 / 1,81	1,941 / 1,99	2,150 / 2,19			
$\zeta_{1-11(11)}$	6,045			3,104	2,220	
$\mu_{1-11(11)}$	0,377			0,494	0,557	
v_{11}, м/с	1,251 / 1,28			1,640 / 1,70	1,851 / 1,89	
$\zeta_{1-12(12)}$		10,412		6,521		2,893
$\mu_{1-12(12)}$		0,296		0,365		0,507
v_{12}, м/с		0,884 / 0,91		1,088 / 1,10		1,513 / 1,56
$\zeta_{1-13(13)}$			35,247		14,361	7,343
$\mu_{1-13(13)}$			0,166		0,255	0,346
v_{13}, м/с			0,433 / 0,45		0,665 / 0,68	0,902 / 0,91
Q, см^3/с	192,31 / 197,89	180,91 / 185,72	165,39 / 169,07	174,71 / 179,32	161,11 / 164,59	154,64 / 158,18
Q^*, %	–2,8	–2,6	–2,2	–2,6	–2,1	–2,2
H_5, мм	−235,47 / −217,5	−178,87 / −165,5	−107,40 / −99,5	−149,54 / −138,5	−88,78 / −77,5	−61,61 / −54,5
$\frac{v_{x+1}}{v_x}$	0,714	0,455	0,201	0,664	0,359	0,596

We introduce the following notation: $x_1 = v_{11}/v_{10}$, $x_2 = v_{12}/v_{10}$. Consumption in the system $Q = (v_{10} + v_{11} + v_{12})S_n = (v_{10} + x_1 \cdot v_{10} + x_2 \cdot v_{10})S_n = v_{10}(1 + x_1 + x_2)S_n = v_{10}S_{np(10)}$, where $S_{np(10)} = (1 + x_1 + x_2)S_n$ – reduced to the speed v_{10} – the area of feeders.

$Q = v_{10}(1 + x_1 + x_2)S_n = \frac{v_{11}}{x_1}(1 + x_1 + x_2)S_n = v_{11}S_{np(11)}$. $S_{np(11)} = S_n(1 + x_1 + x_2)/x_1$ – reduced to the speed v_{11} – the area of feeders.

$Q = v_{10}(1 + x_1 + x_2)S_n = \frac{v_{12}}{x_2}(1 + x_1 + x_2)S_n = v_{12}S_{np(12)}$. Here $S_{np(12)} = S_n(1 + x_1 + x_2)/x_2$, where $S_{np(12)} = S_n(1 + x_1 + x_2)/x_2$ – reduced to the speed v_{12} – the area of feeders.

Then $v_2 = v_{10}S_{np(10)}/S_н = v_{11}S_{np(11)}/S_н = v_{12}S_{np(12)}/S_н$, and

$v_4 = v_5 = v_6 = v_7 = v_{10}S_{np(10)}/S_{cm} = v_{11}S_{np(11)}/S_{cm} = v_{12}S_{np(12)}/S_{cm}$.

We must specify the quantities x_1 and x_2. To begin with, let's take $x_1 = x_2 = 1$. In this case $S_{np(10)} = S_{np(11)} = S_{np(12)} = 3$.

Flow rate in section *8-8*

$v_8S_{cm} = (v_{10} + v_{11})S_n = (v_{10} + x_1v_{10})S_n = v_{10}(1 + x_1)S_n$.

Or $v_8S_{cm} = (v_{10} + v_{11})S_n = (v_{11}/x_1 + v_{11})S_n = v_{11}(1/x_1 + 1)S_n$.

Then speed $v_8 = v_{10}(1 + x_1)S_n/S_{cm} = v_{11}(1/x_1 + 1)S_n/S_{cm}$.

We should also find relations v_{12}/v_7 and v_8/v_7, v_{11}/v_8 and v_9/v_8.

$\frac{v_{12}S_n}{v_7S_{cm}} = \frac{v_{12}S_n}{v_{12}S_n(1 + x_1 + x_2)/x_2}$, $\frac{v_{12}}{v_7} = \frac{S_{cm}}{S_n(1 + x_1 + x_2)/x_2}$ – is relation v_n/v in equation (12).

We find that $v_{12}/v_7 = 1{,}648279$, and $\zeta_{12} = 0{,}518077$.

$\frac{v_8S_{cm}}{v_7S_{cm}} = \frac{v_{10}S_n(1 + x_1)}{v_{10}S_n(1 + x_1 + x_2)}$, $\frac{v_8}{v_7} = \frac{1 + x_1}{1 + x_1 + x_2}$ – is relation v_{np}/v in equation (11). We define:

$v_8/v_7 = 0{,}666667$, $\zeta_8 = 0{,}1$.

$\frac{v_{11}S_n}{v_8S_{cm}} = \frac{v_{11}S_n}{v_{11}S_n(1/x_1 + 1)}$, $\frac{v_{11}}{v_8} = \frac{S_{cm}}{(1/x_1 + 1)S_n}$, $v_{11}/v_8 = 2{,}472418$, $\zeta_{11} = 0{,}313590$.

$\frac{v_9S_{cm}}{v_8S_{cm}} = \frac{v_{10}S_n}{v_{10}S_n(1 + x_1)}$, $\frac{v_9}{v_8} = \frac{1}{1 + x_1}$, $v_9/v_8 = 0{,}5$, $\zeta_9 = 0{,}4$.

Now the expressions (13) - (15) can be written as:

$$H = \alpha\frac{v_{10}^2}{2g}\left[\left(\zeta_н + \lambda\frac{l_н}{d_н}\right)\left(\frac{S_{np(10)}}{S_н}\right)^2 + \left(\zeta_p + \lambda\frac{l_{cm} - 2h}{d_{cm}}\right)\left(\frac{S_{np(10)}}{S_{cm}}\right)^2 + \left(\zeta_8 + \lambda\frac{h}{d_{cm}}\right)\left(\frac{(1 + x_1)S_n}{S_{cm}}\right)^2 + \left(\zeta_9 + \lambda\frac{h}{d_{cm}}\right)\left(\frac{S_n}{S_{cm}}\right)^2 + \zeta_n + \lambda\frac{l_n}{d_n} + 1\right]$$

,

$$H-h=\alpha\frac{v_{11}^2}{2g}\left[\begin{array}{l}\left(\zeta_н+\lambda\frac{l_н}{d_н}\right)\left(\frac{S_{np(11)}}{S_н}\right)^2+\left(\zeta_p+\lambda\frac{l_{cm}-2h}{d_{cm}}\right)\left(\frac{S_{np(11)}}{S_{cm}}\right)^2+\left(\zeta_8+\lambda\frac{h}{d_{cm}}\right)\left(\frac{(1+x_1)S_n}{x_1S_{cm}}\right)^2+\\ \zeta_{11}+\lambda\frac{l_n}{d_n}+1\end{array}\right]$$

,

$$H-2h=\alpha\frac{v_{12}^2}{2g}\left[\left(\zeta_н+\lambda\frac{l_н}{d_н}\right)\left(\frac{S_{np(12)}}{S_н}\right)^2+\left(\zeta_p+\lambda\frac{l_{cm}-2h}{d_{cm}}\right)\left(\frac{S_{np(12)}}{S_{cm}}\right)^2+\zeta_{12}+\lambda\frac{l_n}{d_n}+1\right].$$

Expressions in square brackets are the coefficients of resistance $\zeta_{1-10(10)}$, $\zeta_{1-11(11)}$ and $\zeta_{1-12(12)}$ .We define: $\zeta_{1-10(10)}=9{,}059629$, $\mu_{1-10(10)}=0{,}315289$, $\zeta_{1-11(11)}=9{,}046589$, $\mu_{1-11(11)}=0{,}315494$, $\zeta_{1-12(12)}=9{,}205633$, $\mu_{1-12(12)}=0{,}313026$. By (8) we find that $v_{10}=1{,}143518$ m/s, $v_{11}=1{,}047885$ m/s (for $H-h$), $v_{12}=0{,}934331$ m/s (for $H-2l$). Speed relations: $x_1=v_{11}/v_{10}=0{,}916369$, $x_2=v_{12}/v_{10}=0{,}817067$. And we gave $x_1=x_2=1$. We repeat the calculation with $x_1=0{,}916369$ and $x_2=0{,}817067$ and get: $x_1=0{,}850865$, $x_2=0{,}686247$. For the last values x_1 and x_2 we have by calculation: $x_1=0{,}800223$ and $x_2=0{,}589975$. With further calculations, we do not obtain a convergence of the given and calculated values of the ratio $x_2=v_{12}/v_{10}$. On the contrary, $x_2=v_{12}/v_{10}\to 0$, and $x_1=v_{11}/v_{10}=0{,}714457$ - as in the work of GS from feeders I and II. Surprisingly not this, but the fact that in the experiment from the feeder III water does not really flow, i.e. $v_{12}=0$. Although the liquid level in the bowl is above the feeder III axis by 499.5 mm.

Calculation of drugs from feeders I-IV is similar. From feeders III and IV, water does not flow either by calculation or by experiment, but $x_1=v_{11}/v_{10}=0{,}714457$ –by the use GS from feeders I and II.

Determine the speed and flow rate in a system consisting only of a bowl and nozzle, without a riser

and feeders. Having made BE for sections *1-1* and *3-3* and making the necessary transformations, we get: $\zeta_{1-3(3)}=\zeta_н+\lambda l_н/d_н$, $\mu_{1-3(3)}=\left(1+\zeta_{1-3(3)}\right)^{-1/2}$, $v_3=\mu_{1-3(3)}\sqrt{2gH_{1-3}/\alpha}$, $Q_3=v_3S_н$, where H_{1-3} – is vertical distance between sections *1-1* and *3-3*. $H_{1-3}=0{,}1535$ m. Calculation results are: $\zeta_{1-3(3)}=0{,}289435$, $\mu_{1-3(3)}=0{,}880644$, $v_3=1{,}457161$ m/s, $Q_3=93{,}319621\cdot10^{-6}$ m^3/s.

When flowing from the bowl through the nozzles into the atmosphere, the flow rate is $93{,}32\cdot10^{-6}$ m^3/s, while the feeder I operates, the flow rate is $149{,}03\cdot10^{-6}$ m^3/s, for feeders I and II -$192{,}31\cdot10^{-6}$ m^3/s, 2 times more than the nozzle. This is possible if, in sections below *3-3*, the pressure is below the atomospheric pressure, or, as they say, a vacuum is formed.

Calculation of the vacuum in the gating system is described in detail in *(15)*. The pressure below the atmospheric pressure in the liquid is determined by the value H_{5-X}, measured (with the sign "-") from section *X-X* to section *5-5*, in which a piezometer-vacuum meter is installed (Fig. This head is calculated by the following formula: $H_{X-5} = \left(1+\zeta_{1-5(5)}\right)\alpha v_5^2/2g - H_{1-5}$, where $\zeta_{1-5(5)}$ - the coefficient of resistance of the system from section *1-1* to section *5-5*, reduced to the fluid velocity in section 5-5; H_{1-5} - is vertical distance between sections *1-1* and *5-5*. $H_{1-5} = 0{,}2615$ m. Coefficient of resistance $\zeta_{1-5(5)} = \left(\zeta_н + \lambda\frac{l_н}{d_н}\right)\left(\frac{S_{cm}}{S_н}\right)^2 + \zeta_p + \lambda\frac{l_{3-5}}{d_{cm}}$. Here l_{3-5} – is distance between sections *3-3* and *5-5*. $l_{3-5} = 0{,}1080$ m.

When filling under the flooded level (Figure 2) over the feeder I, the level of the liquid in the mold $H_ф$, increases all the time, and the pressure in the system decreases from the maximum, equal H, to the minimum when the liquid level in the form of the level of the cross section of *5-5* in the riser is reached $H-4h$. As is well known (see, for example, *(16)*), in this case the calculated head is calculated according to the following relationship: $\sqrt{H_p} = \left(\sqrt{H} + \sqrt{H-H_ф}\right)/2$, where $H_ф$ – is the metal level in the form, m.

This is the exact formula for determining the design head when filling a mold with a constant cross-sectional area. The speed of the liquid in the feeder I when this feeder is operating $v_{10} = \mu_{1-10(10)}\sqrt{2g/\alpha}\sqrt{H_p}$.

When filling the form from the feeder I to the feeder II $\sqrt{H_p^{I-II}} = \left(\sqrt{H-0{,}005} + \sqrt{H-h-0{,}005}\right)/2 = 0{,}820$ m$^{1/2}$, and the design head $H_p^{I-II} = 0{,}672$ m. On the section between feeders II and III $\sqrt{H_p^{II-III}} = \left(\sqrt{H-h-0{,}005} + \sqrt{H-2h-0{,}005}\right)/2 = 0{,}743$ m$^{1/2}$, head is $H_p^{II-III} = 0{,}552$ m. Between feeders III and IV $\sqrt{H_p^{III-IV}} = \left(\sqrt{H-2h-0{,}005} + \sqrt{H-3h-0{,}005}\right)/2 = 0{,}658$ m$^{1/2}$, head is $H_p^{III-IV} = 0{,}433$ m. On the section between the feeder IV and the section level *5-5* $\sqrt{H_p^{IV-5}} = \left(\sqrt{H-3h-0{,}005} + \sqrt{H-4h-0{,}005}\right)/2 = 0{,}560$ m$^{1/2}$, head is $H_p^{IV-5} = 0{,}314$ m. The marks of the levels in the form are shifted upwards by 5 mm from the longitudinal axes of the feeders, therefore in the formulas there is a value of 0.005 m.

The volume of fluid between feeders $W = 0{,}252 \cdot 0{,}253 \cdot 0{,}119 = 7{,}587 \cdot 10^{-6}$ m^3. Time for filling this volume with liquid $\tau = W/Q$.

In the calculations, the flow coefficients from Table 1 were used. Theoretical and experimental (in the denominator) data - in Table. 3. $\tau^* = 100\left(\tau - \tau_э\right)/\tau_э$, %.

Table 3. Characteristics of the gating system with one feeder filling the mold for a flooded level

Working feeders	Filling volumes	Indicators		
		H_p, м	τ, с	τ^*, %
I	I–II	0,672	53,34/51,6	+3,4
	II–III	0,552	58,82/59,1	–0,5
	III–IV	0,433	66,44/67,8	–2,0
	IV–5	0,314	78,12/75,8	+3,1
	I–5		256,72/254,3	+1,0
II	I–II	0,619	55,47/56,0	–0,9
	II–III	0,552	58,72/57,4	+2,3
	III–IV	0,433	66,30/68,0	–2,5
	IV–5	0,314	77,90/80,8	–3,6
	I–5		258,39/262,2	–1,5
III	I–II	0,500	61,63/60,8	+1,4
	II–III	0,500	61,63/60,4	+2,0
	III–IV	0,433	66,20/68,5	–3,4
	IV–5	0,314	77,78/80,1	–2,9
	I–5		267,24/269,8	–0,9
IV	I–II	0,381	70,50/72,5	–2,8
	II–III	0,381	70,50/72,3	–2,5
	III–IV	0,381	70,50/72,6	–2,9
	IV–5	0,314	77,66/80,2	–3,2
	I–5		289,16/297,6	–2,8

To calculate the filling of the form for the flooded level (Fig. 2), when feeders I and II operate in the area between feeders I and II, proceed as follows. Let us take the ratio of velocities $x = v_{11}/v_{10} = 0{,}714457$ for the case when the drain comes from the feeders (without the form) - to start the calculation. Expiration from the feeder II occurs at a constant head $H - h$; we use the formula (8). Expiration from the feeder I occurs with a variable head varying from $H - 0{,}005$ to $H - h - 0{,}005$, and the design head is $H_p^{\text{I–II}} = 0{,}672$ m, as was shown above. We replace in the expression (10) H by $H_p^{\text{I-II}}$, we calculate and get: $x = 0{,}748643$.. By successive approximations, we find that $x = 0{,}857764$. The given areas of feeders: $S_{np(10)} = 1{,}857764 S_n$, $S_{np(11)} = 2{,}165822 S_n$. $\zeta_{1–10(10)} = 3{,}780263$, $\mu_{1–10(10)} = 0{,}457377$, $\zeta_{1–11(11)} = 4{,}982627$, $\mu_{1–11(11)} = 0{,}408841$. $v_{10} = 1{,}583103$ m/s (for $H_p^{\text{I–II}}$), $v_{11} = 1{,}357929$ m/s (for $H - h$). Consumption in the system $Q = Q_{10} + Q_{11} = 188{,}349800 \cdot 10^{-6}$ m^3/s.

The time for filling the mold volume between the feeders I and II $\tau_{\text{I–II}} = 40{,}28$ s. In the experiment was obtained $\tau^э_{\text{I-II}} = 42{,}4$ s. Ratio of $\tau^* = 100\left(\tau_{\text{I–II}} - \tau^э_{\text{I–II}}\right)/\tau^э_{\text{I–II}} = -5{,}0$ %. A very good result for such a complex process, when there is a rise in the level of metal in the mold

and the pressure from H up $H-h$ is constantly decreasing, the coefficients change ζ_9 and ζ_{11}, the flow coefficients $\mu_{1-10(10)}$ and $\mu_{1-11(11)}$, the rates and flow rates of the fluid change.

Filling the form on the section between feeders II and III is calculated in a similar way. For starters, we take $x = 0{,}857764$ – as on the site intermittent feeders I and II. The design head is $H_p^{\text{II–III}} = 0{,}552$ m and is the same for both feeders. By successive approximations we find that $x = 1{,}004714$, while the filling time of this section of the form $\tau_{\text{II–III}} = 43{,}45$ s. In the experiment $\tau_{\text{II–III}}^{э} = 45{,}0$ s. Ratio is $\tau^* = -3{,}4$ %. When filling the sections between feeders III and IV, between feeder IV and section *5-5*, the coefficients of resistance $\zeta_{1-10(10)}$, $\zeta_{1-11(11)}$, and flow $\mu_{1-10(10)}$, $\mu_{1-11(11)}$ are the same as for the volume between feeders II and III. Only the design heads change.

Calculation of the filling of the form under the flooded level for the operation of feeders I and III, I and IV, I-III, I-IV is carried out in a similar manner. Calculated and experimental results - in Table. 4-8.

Table 4. Characteristics of the gating system with feeders I and II

Indicators	Filling volumes			
	I–II	II–III	III–IV	IV–5
$\zeta_{1-10(10)}$	3,780	4,326	4,326	4,326
$\mu_{1-10(10)}$	0,457	0,433	0,433	0,433
v_{10}, m/s	1,583	1,360	1,204	1,024
$\zeta_{1-11(11)}$	4,983	4,277	4,277	4,277
$\mu_{1-11(11)}$	0,409	0,435	0,435	0,435
v_{11}, m/s	1,358	1,366	1,210	1,029
v_{11}/v_{10}	0,858	1,005	1,005	1,005
τ, s	40,28 / 42,4	43,45 / 45,0	49,08 / 50,1	57,71 / 60,2
τ^*	–5,0	–3,4	–2,0	–4,1

Filling time: $\tau = 190{,}52$ s, $\tau_э = 197{,}7$ s, $\tau^* = -3{,}6\,\%$

Table 5. Characteristics of the gating system with feeders I and III

Indicators	Filling volumes			
	I–II	II–III	III–IV	IV–5
$\zeta_{1-10(10)}$	2,796	3,670	4,314	4,314
$\mu_{1-10(10)}$	0,513	0,463	0,434	0,434
v_{10}, m/s	1,777	1,452	1,205	1,025
$\zeta_{1-12(12)}$	7,956	5,107	4,237	4,237
$\mu_{1-12(12)}$	0,334	0,405	0,437	0,437
v_{12}, m/s	0,997	1,208	1,214	1,033
v_{12} / v_{10}	0,561	0,832	1,007	1,007
τ, s	42,71 / 42,6	44,53 / 44,5	48,96 / 50,3	57,57 / 59,5
τ^*	+0,3	+0,1	–2,7	–3,2

Filling time: $\tau = 193{,}77$ s, $\tau_э = 196{,}9$ s, $\tau^* = -1{,}6\,\%$

Table 6. Characteristics of the gating system with feeders I and IV

Indicators	Filling volumes			
	I–II	II–III	III–IV	IV–5
$\zeta_{1-10(10)}$	2,039	2,546	3,513	4,302
$\mu_{1-10(10)}$	0,574	0,531	0,471	0,434
v_{10}, m/s	1,986	1,667	1,308	1,026

$\zeta_{1-13(13)}$	20,40	9,691	5,345	4,198
$\mu_{1-13(13)}$	0,216	0,306	0,397	0,439
v_{13}, m/s	0,563	0,797	1,034	1,037
v_{13}/v_{10}	0,284	0,478	0,791	1,010
τ, s	46,48 / 46,2	48,09 / 49,4	50,58 / 51,7	57,43 / 59,3
τ^*	+0,6	–2,7	–2,2	–3,2

Filling time: $\tau = 202{,}58$ s, $\tau_э = 206{,}6$ s, $\tau^* = -1{,}9\,\%$

Table 7. Characteristics of the gating system with feeders I, II and III

Indicators	Filling volumes			
	I–II	II–III	III–IV	IV–5
$\zeta_{1-10(10)}$	4,294	6,983	8,786	8,786
$\mu_{1-10(10)}$	0,435	0,354	0,320	0,320
v_{10}, m/s	1,504	1,111	0,888	0,756
$\zeta_{1-11(11)}$	5,874	6,908	8,694	8,694
$\mu_{1-11(11)}$	0,381	0,356	0,321	0,321
v_{11}, m/s	1,267	1,116	0,893	0,759
$\zeta_{1-12(12)}$	162,4	18,64	9,912	9,912
$\mu_{1-12(12)}$	0,078	0,226	0,303	0,303
v_{12}, m/s	0,233	0,674	0,841	0,715
v_{12}/v_{10}	0,156	0,606	0,947	0,947
v_{11}/v_{10}				

τ, s	0,843	1,005	1,005	1,005
τ^*	39,43 40,2 –2,1	40,84 42.4 –3,7	45,18 45,8 –1,4,	53,12 55,5 –4,3

Filling time: $\tau = 178{,}57$ s, $\tau_э = 183{,}9$ s, $\tau^* = -2{,}9\,\%$

Table 8. Characteristics of the gating system with feeders I, II, III and IV

Indicators	Filling volumes			
	I–II	II–III	III–IV	IV–5
$\zeta_{1-10(10)}$	4,249	6,983	9,828	14,25
$\mu_{1-10(10)}$	0,436	0,354	0,304	0,256
v_{10}, m/s	1,511	1,111	0,845	0,605
$\zeta_{1-11(11)}$	5,822	6,908	9,726	14,11
$\mu_{1-11(11)}$	0,383	0,356	0,305	0,257
v_{11}, m/s	1,272	1,116	0,848	0,608
$\zeta_{1-12(12)}$	185,8	18,63	11,07	16,01
$\mu_{1-12(12)}$	0,073	0,226	0,288	0,242
v_{12}, m/s	0,218	0,674	0,800	0,573
$\zeta_{1-13(13)}$	∞	∞	291,0	19,63
$\mu_{1-13(13)}$	0	0	0,059	0,220
v_{13}, m/s	0	0	0,152	0,520
v_{13}/v_{10}	0	0	0,182	0,859
v_{12}/v_{10}	0,145	0,606	0,947	0,947

v_{11}/v_{10}	0,842	1,005	1,005	1,005
τ , s	39,48 / 38,5	40,84 / 41,0	44,79 / 46,7	51,38 / 52,8
τ^*	+2,4	–0,4	–4,2	–2,7

Filling time: $\tau = 176{,}49$ s, $\tau_э = 179{,}0$ s, $\tau^* = -1{,}4\,\%$

Results and discussion

Experimental values of speeds and costs differ from calculated ones by no more than 5%. The differences are small, and it is difficult to make any conclusions. In general, we can assume that a good correspondence of the theoretical and experimental data is obtained.

When carrying out calculations and experiments it was found that a vacuum is formed in section *5-5* (Fig. 1), which is measured by the liquid level in a piezometer-vacuum meter (PV). If the liquid level in the PV is above the axis of section 5-5, then the pressure is above atmospheric pressure; if lower - then in the section of the vacuum (the pressure is less than atmospheric). And if the pressure in section *5-5* is above atmospheric, then scotch *7* (Figure 1) is slightly bent outwards, and if lower - it is concave into the riser. Through a transparent tape *7* it can be seen that section *5-5* is completely filled with liquid. At Fig. 2 shows the position of the liquid in the PV during the operation of the feeders I and II: by 237.45 mm according to the calculation and by 217.5 mm in the experiment below the cross-section level *5-5*. Or, respectively, below atmospheric pressure by 23.745 g/sm2 and 21.75 g/sm2.

When filling without form through feeders I and II, switching on the feeder III or feeders III and IV does not result in an increase in the flow rate in the system. Why this does not happen is unclear. It is possible that the system achieves the maximum vacuum for these GS dimensions, determined by the properties of water.

In the absence of mold, when feeding through I and II feeders, I and III, I and IV, II and III, II and IV, III and IV, the ratio of speed in the upper feeder v_{x+1} to the speed in the lower feeder v_x is 0.714, 0.455, 0.201, 0.664, 0.359, 0.596 (a change of 3.5 times), which corresponds to the experimental data and supports the proposed methodology for calculating GS.

Note that when feeders I and II, I and III, I and IV operate, feeders I fill 50.9, 54.6 and 62.8% of the volume of the mold respectively. For the system from feeders I, II and III, 39.0% of the volume of the mold is filled through the feeder I, 37.2% through the feeder II, and 23.8% through the feeder III. The system of four feeders has the following characteristics: feeder I - 36.7% of the volume of the mold, feeder II - 34.8%, feeder III - 21.4%, feeder IV - 7.1%.

Let us note the simultaneous operation of feeders I, II, III and IV. When the drain goes down from top to bottom according to the scheme in Fig. 1, then the ratios of the velocities are as follows: $x_1 = v_{11}/v_{10} = 0{,}714$, $x_2 = v_{12}/v_{10} = 0$, $x_3 = v_{13}/v_{10} = 0$. When filling the form under the flooded level (Figure 2) from the feeder I to the feeder II $x_1 = 0{,}842$, $x_2 = 0{,}145$, $x_3 = 0$. Between feeders II and III $x_1 = 1{,}005$, $x_2 = 0{,}606$, $x_3 = 0$. On the site from the feeder III to the feeder IV $x_1 = 1{,}005$ $x_2 = 0{,}947$, $x_3 = 0{,}182$. Between feeder IV and section *5-5* $x_1 = 1{,}005$, $x_2 = 0{,}947$. These are the average figures for each volume in height. In fact, as the liquid level rises, these ratios continuously change, since the coefficients for the branching of part of the flow and for the flow passage and the acting head, for example, between feeders I and II from H to $H - H_\phi$. And the fact that a good coincidence of theoretical and experimental data has turned out raises doubts about the results of the work. After all, it was possible to calculate such a complicated process due to the calculated head H_p and the method of successive approximations, known long ago to hydraulics and foundry workers, in determining the ratio of velocities v_{11}/v_{10}, v_{12}/v_{10}, v_{13}/v_{10}, and at the beginning of the calculation one can take arbitrary numbers. But let us remember the words of E. Wigner: "In principle, we do not know why our theories" work "so well. Their accuracy may not yet indicate their correctness and consistency" *(17, p. 197)*.

Conclusion

Thus, for the first time it was possible to theoretically and experimentally investigate the longline gating system without the reverse riser. The vacuum value in the liquid flow in the riser has been calculated and tested experimentally. It is calculated separately filling each volume of the form between feeders. Change as the level of metal in the form of the coefficients of resistance to the division of the flow, the flow rates of all operating feeders, the rate of flow of liquids from the feeders change. However, the use of the design head and the method of successive approximations in calculating the ratio of velocities made it possible to calculate the filling of the sections of the mold between the feeders and the entire shape, even for such a complex system as the longline in which the feeders are located at different height in the mold and are included in the pouring at different times.

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Didactics

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Forming Student's Cognitive-Communicative Skills as a Topical Pedagogical Problem

Key words*: comparison, communicative, cognitive, communication, perceptive, interactive, communicative situation.*

Annotation: *In the given artice, the main issue mentioned is aboud importance, efficiency and procluctivety of teaching between the state language and Kazakh langguage based on communicative cognitive situations and organizations of the lesson. The principal purpose is to bring up preschool and comprehensive school PP on the level.*
It is paid for much attention on creating comfort table situations and practicing speech skills for speaking communicative.

Perfection of student's personality is a priority goal in the educational-training process of general secondary education. In the "Concept of mother tongue education at Uzbek schools" great attention is paid to the issues of establishing teacher and student cooperation, turning the student to the subject of education and raising student's speech culture through understanding and thorough study of means of expression in the process of education.

At the lessons of mother tongue students can hardly connect grammar rules with their use in speech, students may learn grammatical rules excellently but they still lack speaking skills. Constant development of each student depends on the cultivation of learning and communicative skills.

It is very important to form and develop student's communicative-cognitive skills in order to raise the student to the level of subject of education. You cannot solve the problem by telling them that they should think freely and independently, speak expressively, use grammar in speech. You must influence on the development of these actions.

Below are the priority lingua-didactic issues on developing student's communicative skills:

- It is important to study and get knowledge independently and not provide education
- To give special attention to the fact that the state language is a means of communication in Uzbekistan, the Republic of ethnic diversity.
- To create favorable communicative atmosphere, to develop student's speaking skills through active participation in communicative activities so that students acquire fluency in both languages
- Motivate student's interest to learn languages

- To take advantage of using any communicative situation, connected with the development in all the spheres of social life, spiritual and moral issues, national ideology, market economy
- To inspire love for their native land and sharpen the sense of independence through introduction of Uzbek and Kazakh peoples' ethnic and cultural peculiarities.

Student's acquired knowledge of mother tongue economizes the time spent on the theoretical information and creates more opportunities for practical exercises.

Present methodology focuses on planning lessons in advance. Planning lessons in advance allows teacher and student's active preparation on the topic; it develops the skills of research and making a certain decision.

Conscious grasp of the material allows of negligence of grammatical rules and express opinions and thoughts on the topic.

The content of education and training consists of communication (transmission influence), interaction (teacher-student impact), Perception (inter human perception). Based on advanced pedagogical technologies foreign pedagogical system practice indicates that practical skills take precedence over theoretical knowledge (60 % and 40 %).

On the stage of remarkable grasp of linguistic phenomena in the language classroom communicative-cognitive method is adopted through the following actions:

1. Using the research method to ask leading questions on peculiarities of the linguistic material
2. Observation and analysis of practical exercises, to encourage students to ask open questions calling for collaborative work in educational process.
3. Student's making his own decision on the topic and expressing personal opinions on it.
4. To encourage students to make a comparison of their personal decisions with the rules in a textbook
5. To illustrate a number of confirming the decision examples with the purpose of applying the acquired knowledge in practice

It is evident that specific questions on a linguistic phenomenon are the first step in developing cognitive-communicative skills in students. It is difficult for the student to reveal the peculiarities of linguistic phenomena by himself.

Theoretical knowledge by heart or reciting does not mean that the student grasped it thoroughly. As Albetkova notes, "Theoretical knowledge acquisition can be displayed not by student's clear pronunciation of rules but by understanding the main point of the rule and when he applies it reading a book and creating a speech product" (1, p. 22).

According to the State education standards the new adopted program differs from the previous one that it is not directed to the "from grammar-to development of speech" method, but it focuses on the "from speech development - to grammar" method, and each chapter and section is based on the methods of speech development.

The fact that the branches of descriptive linguistics – such as phonetics, orthoepy, orthography, lexicology, lexicography, morphology, syntax study two forms of speech-oral and written

shows that these subjects are closely connected with the culture of speech. They are presented to boost student's speech, but in a dependent way.

As according to the requirements of mother tongue education "the student personality should be taught to think, to understand others' thought, to be competent to express the consideration in written and oral form, in other words to develop communicative competence.

At the lessons of mother tongue the student's skill of expressing creative ideas in written form are honed by creative activities such as essay and text writing.

Creative idea is a way of developing the sense of self; the student expresses his own opinions, point of view, assessment and attitude towards some event, incident or process independently.

Actually one of the main tasks of the mother tongue education is to foster a socially developed, able to think independently, and well educated person of considerable culture and communication. For this reason the mother tongue education sets goals:

- "to develop the student abilities to considerate, to cultivate their mental and logical thinking

- to direct the student to develop the sense of self and material reality by expressive means of the language and express his personal opinions and feelings using the mother tongue extensively" (2, p. 47).

The aim of the mother tongue education is to provide general education and cultivate communicative skills, to apply the acquired skills and abilities for other purposes.

Cultivation of communicative skills, communicative or practical objective differs from the objectives of teaching other subjects. Communicative or practical objective means developing the student skills of understanding others' thoughts and expressing their own opinions orally and in writing.

General, educational and developing objectives are set up in the process of achieving communicative goals. By means of communicative objective (practical) the Kazakh language skills are developed. Students should apply the lexical, grammatical and pronunciation materials in speech independently. As a result speech, reading and writing skills are cultivated.

The communicative method has been popularized in the methodology of teaching languages. The term has been used extensively expressing new academic concepts in a number of word combinations: Communicative principle, communicative method, and communicative linguistics, communicative technology, communicative competence, communicative task and purpose, communicative direction, communicative activity, communicative situation, communicative approach, grammar, professional skill, need, exercises, ability and others.

In the education system all the given concepts aim to develop student's speaking skills and abilities. And this is realized through applying the theory in speech. The student can transfer or

get information on the obtained knowledge. In both cases he is a communicant, and the student's communicative capacity is displayed in his language speaking skills.

Student's speech activity sets great number of tasks. One of them is the communicative task. According to the task it is expected to boost communication, interpersonal relationship and treatment. In this process information and opinions exchange is carried out. The culture of speech is also formed. The speech culture teaches students the secrets of communication beginning from everyday greeting up to discussing whom, for whom, why, who to, what for, when, where and when questions.

What is the cognitive approach? The English word "cognitive" means "learned", the process of individual's independent study, self training of qualifications and skills. Student gets the necessary information not via listening but as a result of independent study. Cognitive process results in student's acquisition of knowledge.

According to the lingua didactic concepts of the cognitive theory creators, W. Rivers (and others), it is important to keep to the principles of consciousness and comparative analysis of the differences of foreign language and mother tongue should be done. In fact the process of language learning is carried out in the atmosphere of mother tongue and the goal is achieved by boosting student's communication in this language.

The priority task in the cognitive communicative approach is to develop speech communication. Then the interference difficulties of linguistic phenomena in the target language are thoroughly explained (3, p. 28-34). In the USA and western countries cognitive science dynamically entered into the system of pedagogy and didactics in the sixties of our century. This tendency forms the direction of conscious verbal- cognitive education in line with the verbal method (language learners' active participation in speech communication and strive for displaying their own self), the method which was popularized in that period of time.

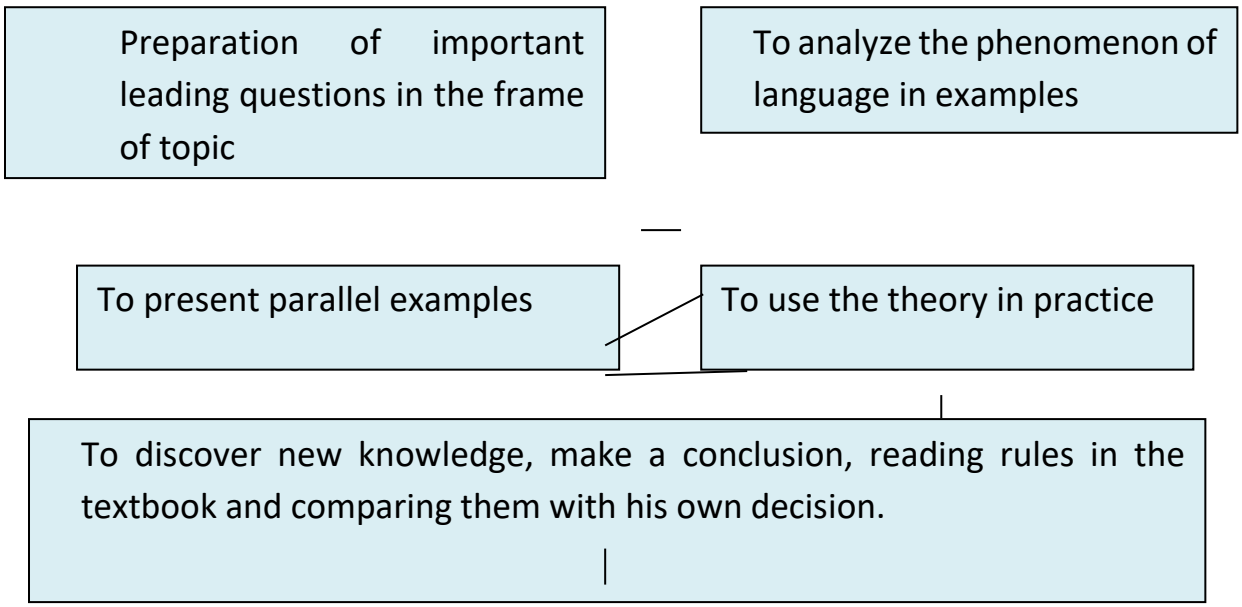
Popularization of the PTMTE method (new pedagogical technologies in the mother tongue education) among teachers should be one of the priority tasks and teachers' practical application of the discovery teaching method is very important.

In order to increase the efficiency of lessons conducted with the new textbooks and new pedagogical technologies, students should be provided with the sources of extra information (research, extraction and selection); for the time being textbooks are the only sources and of course it is not sufficient. In continuous education applying the conscious verbal-cognitive method, the teacher sets the priority tasks of developing creative personality, cooperation and discovery. Thus, the significance and content of the communicative – cognitive method are:

- to conduct oral communication;

- practical, general educational, cultivating and developing significance of the acquired knowledge. It requires language communication and extensive knowledge (5, p. 16).

At the end of the XX century the education system is comprised of communicative methodology. The way of realizing of the cognitive-communicative method can be shown in the following graph:



The goal is to study the teaching materials in correlation, teacher-student collaboration, and of course students should research the necessary information independently and be directed to use it in speech or in practice, as well as to explain the new topic and fix it, to check and make conclusions on knowledge, skills and abilities, in other words to reinforce the practical speaking skills.

When applying the given method it is necessary to refer not only to the tasks and assignments from the textbook, as reinforcement of practical speaking skills is connected with the further development of student's mental ability, this practice can be implemented in the process of knowledge acquisition during several lessons.

Student can get the theory from teacher's lectures, textbooks, additional literature, internet and other sources, but the point is that whether the growing generation will be able to implement the acquired knowledge into practice. This process should be reflected in all layers of language education.

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Use of Periodicity in Teaching Physics

Key words*: periodicity in teaching, didactics, physics course, effective methods, formation of outlook, material, educational process.*

Annotation*: the article partially represents developed technology of teaching physics with the help of the pedagogical technology of teaching the subject of physics, which can be applied in the process of teaching in secondary school in secondary specialized education, in the creation of textbooks and educational literature, in the development of new forms of independent and distance learning and in the system of advanced training of teachers.*

These ideas of teaching physics technology can be used when studying other subjects in secondary schools, on average special education, and at other stages of education.

One of the main ways of developing didactic knowledge, updating this knowledge at the stage of pedagogy development is to justify the periodicity of instruction. Since the periodicity of instruction, being one of the main problems of the theory and practice of pedagogy, its practical justification will positively influence the development of the expansion of ideas about the process of teaching the development of the attitude of didactic incidents. Periodicity is a general pattern, embodying in natural, social and intelligent phenomena, which ensures the uninterrupted repetition of development processes with repetition. Change in the seasons is due to the regularity of periodicity. Undoubtedly, the course of school physics also has its own periods.

In psychological didactic studies the expressions like "periodic management", "didactic period", "learning period" are used. However, the meaning of these expressions and corresponding concepts is not comprehensively analyzed and the meaning of each of them is separately limited.

The famous didactic scientist MA. Danilov first substantiated the concepts, like, "logic of the learning process", "the acting forces of the learning process", "joint of the learning process". According to this scientist, the logic of the learning process consists of combining the content of a scientific subject and the psychology of assimilation, the joint is the smallest unity in the movement of the learning process, in teaching, the assigned intellectual and practical tasks for the learner are the acting forces of the learning process.

The set intellectual and practical tasks in the learning process, the complexity of educational problems and independent work, lead to opposites of cognition - learning in the minds of students. In the process of teaching, opposites acting on the consciousness of students are defined in two forms:

1. Negative opposites. This kind of opposites must be destroyed on time, because they interfere with the reasonable course of learning and learning of students.

2. Positive opposites. For the reasonable course of the learning process, the necessary opposites. This kind of opposites destroyed; on the contrary, they are formed by special methods in teaching. Cognition as positive processes of positive opposites, aspiration to solve them, helps to develop independent thinking and effective solution of mental and practical problems. In studies related to the programmatic problems of teaching NF. Talysina, the expression "periodic management" is used, where the student's performance is aimed. According to the scientist, to achieve the final result in the learning process must be managed, since it is impossible to control the final result (1).

LYa. Zorina uses the term "didactic period" from the point of view of general didactics. "Training," she writes, "is a bundle of interrelated actions of students with the teacher. To ensure the work of this bundle for a while, it is necessary to separate such unity, where the essence of wholeness is reflected. This unity, which includes integrity, is called the didactic period" (2).

The didactic period performs the task of optimal assimilation to the degree of requirements of some of the content of information. Based on this idea, the scientist shares five periods in the learning process: the decisions of didactic tasks and their assimilation to students; the announcement of some of the scientific material and the conscious consideration of the student; organization the use in practice of new knowledge of the use of their students; establishment opposing connections and self-control of students; preparation for extracurricular activities (3).

The divided unity of LYa. Zorina can hardly be called didactic periods or cycles, they resemble training rings - acts justified in the studies of MA. Danilov. Firstly, a period, a vastly broad, meaningful event, which contains a bunch of learning acts and steps. Secondly, without marking the measures of separation of periods of training, one can not reflect on the periods of the learning process. In addition, it is difficult to think about the periods of the learning process without noticing in advance the form, purpose, means, and results of the recurrence in the action of the students of the scientific material being studied.

The act is the smallest unity of the learning process (4). Developing during the learning process, acts are transformed into levels of learning, and stages develop in periods. Periodic movement of training can be characterized in two ways. To expound the events of learning, by going from the universal to the individual in the process. The study of the learning process in this way is conducted from the general presentation to its acts, steps, periods. The study of instruction in this way is traditional; in the observation of the transformation of developed acts into stages is somewhat more complicated. Organize a course in the teaching of school physics, management, control of the current traditional practice is formed this way. The weak side in the same is, that is, the goal and means of transition from acts of instruction in stages or periods are not obvious. If the narration of the story is from individuality to universal, then the observation of the phenomenon that works in the teaching of physics will be facilitated: the possibilities to mark the results achieved in each subsequent period, the transformation into the period of learning of developed scientific acts and steps, are facilitated.

The periods of physics training in school are comparable with the spiral motion with increasing amplitude. Since each ring of the spiral is associated with the starting point, the beginning of the learning process will return to its end point. As a result of returning to the starting point and

moving to a further point, changes occur in the subjects of learning, and according to these changes, the developmental action begins.

Changes occur in the actions of the teacher and students in a parallel way, as they are peculiar. The development of the current changes in the teacher's actions is included in the following: the choice of the corresponding goal for the periods of the physics education process, to inform them before students, to achieve a concrete result using the means of their moral outlook, managing the transition from period to period, organizing the connection between the scientific material and students. To convey the results of control to students. However, the teacher, in the conditions of training, acquainting students with skills, concepts, laws, and to the relation of nature, to society, to conscious phenomena, develops his pedagogical activity. Unlike the social distribution of labor, the pedagogical creativity of the teacher is a separate public institution (5).

Pedagogical activity consists of four components: **the ability to organize the activities** of students. This ability is called organizational activity. To organize is to use the relationship between the student and the teaching material.

The relationship between learners and teaching material can be grouped as follows: intentional interrelation - the relationship between students and any scientific material; meaningful relationship - the relationship between students and the scientific material being studied; functional relationship - the relationship between students and the work performed in the action of the studied object; Methodological relationship - the relationship between students and the method of teaching students with scientific material, etc. **The activity of management** is the guidance of students in the assimilation of scientific material; **The activity of the relationship** is the attitude of the teacher to the students, explaining the topic in a generally accessible way, this means taking care of the students; **The activity of training** - planning of training, analysis of learning outcomes.

In order to have a more clear idea of the components of pedagogical activity, we propose the following figure (Figure 1).

Changes in the actions of students arise from the influence of the teacher and are managed by the teacher. Students from the act to the act advances by analyzing the collection of interrelated concepts. In the initial stage of the study, students are bothered to distinguish new concepts from those previously studied. These concepts are continuous.

Sometimes students become confused in very simple terms, like, multiplication and division, or they may not distinguish between measures of mass and volume, and this is not always considered the result of low development, on the contrary, this is the result of insufficient training over only the acquired knowledge.

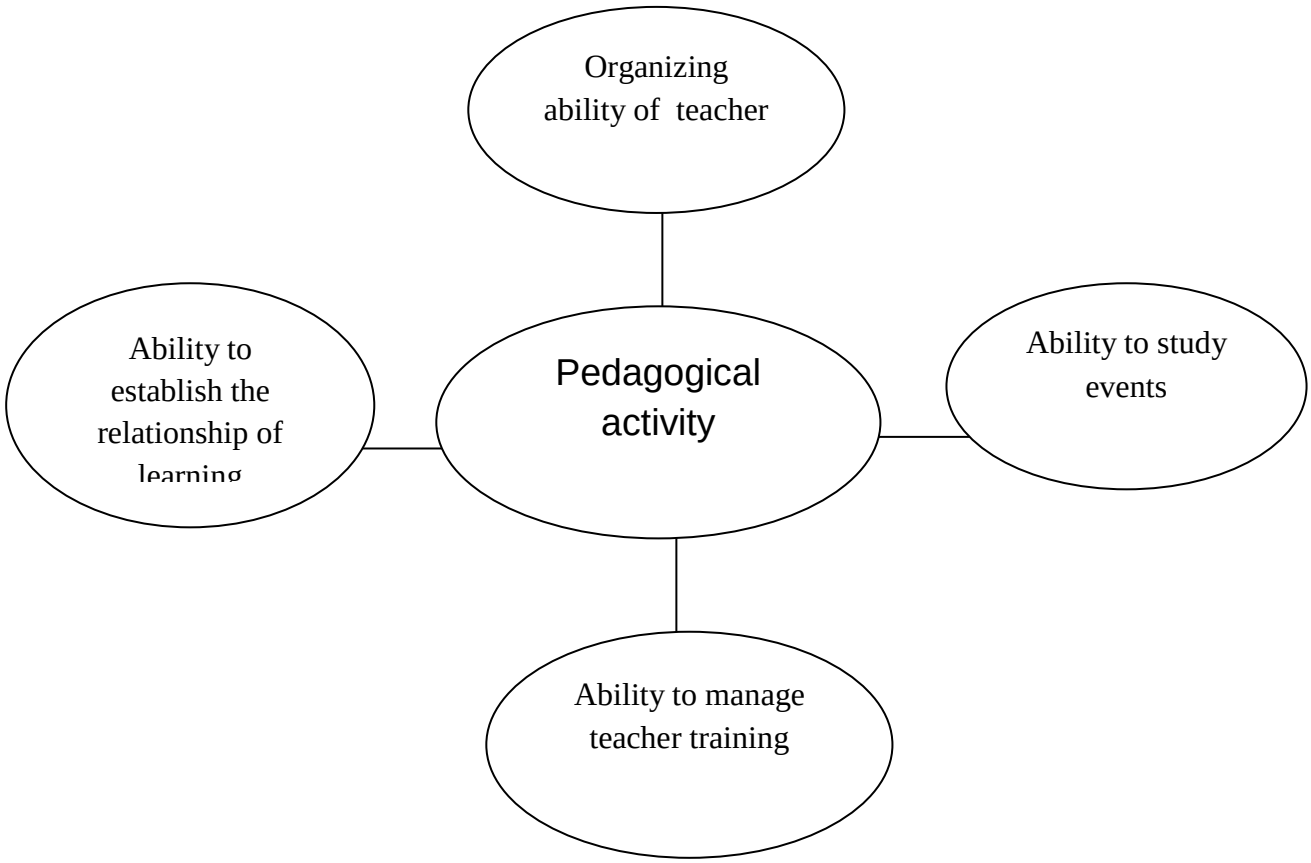

Figure 1. Structure of teacher's activity

Thus, the student's weaknesses are destroyed with comprehensive analysis of the facts pertaining to the topic, with continuous repetitions of rules and initial concepts on this topic, with solutions to problems of varying degrees of difficulty on this topic. During the transition from the period to the next period, the acquired concepts are clarified in the mind, the skills develop, the actions are accelerated. Students do not immediately master the concept, but gradually master its content, scope, connections and relationships with other concepts. In the process of studying a new topic, students in the beginning form separate concepts, then a system of concepts (concepts of certain expressions or terms). The concept of one system is realized through their connection with the concepts of other systems.

The assimilation of the concepts of this science is more successful if they are connected with the concepts of other sciences and previously acquired knowledge of other subjects. Simultaneously with the process of formation of new ones, the previously formed concepts are deepened, at the same time, their new sides, relationships and relationships are revealed, and the boundaries of application are specified. This process is called the concretization of concepts.

The initial period of physics training, that is, the concentration of information on topics consists of a number of stages: preparation for the accumulation of information; Receiving information from various sources; Reinforcement of information. The achieved results in these stages are

considered as a kind of micro-results that perform the work of different types in the minds of students: the consciousness of the need to study the topic; Activity in the process of receiving information; The use of the result of training in practice. Each stage consists in a timely manner of the acts, the macro result is achieved in the period. In other words, in the stages and acts of the microscience, and in the period, the macro result is achieved. And so, the acts, the stages of learning are studied in the period and are organized in the structure of the period.

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Requirements for Creating Electronic Informational and Educational Resources on Subjects of Mathematical Cycle in Global Internet

Key words: *electronic information and education resources, interactive educational complex, color, math, global, Internet, Web portal, requirements, software tool.*

Annotation: *he article describes requirements for creating electronic informational and educational resources on the subjects of mathematical cycle with the aim of placing them in the global Internet, defined the stages of preparation of educational material for electronic resources.*

In recent years, created the necessary conditions for learning mathematical disciplines on the basis of electronic information and educational resources, so the ability to use the Internet in computer classes of educational institutions, specially equipped for work with Internet. In this

context, becomes actual the problem of creating EIER on the subjects of mathematical cycle with access to the Internet and the development of teaching methods on the basis of future generations.

In research scientists of Uzbekistan today reflected many of the issues associated with the creation and use of information and educational resources, interactive training systems, electronic books. In particular, in this direction carry out their research N.Muslimov, D.Sayfurov, M.Usmonboeva, A.Turaev, (development of requirements for the creation of IER); N. I. Taylakov, M. Kh.Allambergenova (definition of requirements for the creation of interactive educational complexes); A.B.Mukhamedshina, N.I.Taylakov (development of requirements for the creation of electronic textbooks).

According to N. A. Muslimova (1) created electronic informational and educational resources must meet the following requirements:

- compliance, on the basis of which educational programs and teaching AIDS, approved by the scientific-methodological Council;
- correlation with the contents of the electronic versions of methodological manuals published earlier in the field EIER (General or special courses);
- the disclosure of the content of a particular training course (or its part), a reflection of the opportunities for achieving the learning-methodical purposes;
- the introduction of elements of clarity that help to realize the educational-methodical tasks (display opportunities to maximize the use of computer multimedia);
- consideration of placement of materials on the screen and in the network, the possibility of using hyperlinks in text, Web sources and other information resources in necessary situations;
- the availability of test questions, providing independent evaluation of the degree of assimilation of material by students, creation of conditions for the use of the materials in different languages (including categories).

Compliance with laws of color registration as the reasonable color scheme creates the certain mood at users influencing digestion of material is important for creation of EIER on a cycle of mathematical disciplines. It is known that red color makes active, excites, pastel tone - on the contrary, calm. Saturated yellow, red paints - are considered as warm, hot, blue, violet - cold tones. The combination and that and others has an optimum effect. It is expedient to use as the primary light and warm colors, and already as secondary, additional cold tone.

It is necessary to take into account effect of animation, a possibility of combination of short data in blocks, to consider harmony of a font of headings and the text the text was easier to be read. It is recommended to use in EIER at the same time no more than three combined flowers and conveniently readable font to provide independent assimilation of a training material for shorter time and also his storing and development of logical thinking of learners and students (2).

During creation and use of electronic information and education resources in objects of a mathematical cycle it is necessary to rely on the available scientific and pedagogical and methodical experience taking into account psychological and psychophysiological features of

assimilation of a training material and also proceeding from opportunities of computer visualization and technical requirements to the presentation of information (Table 1)

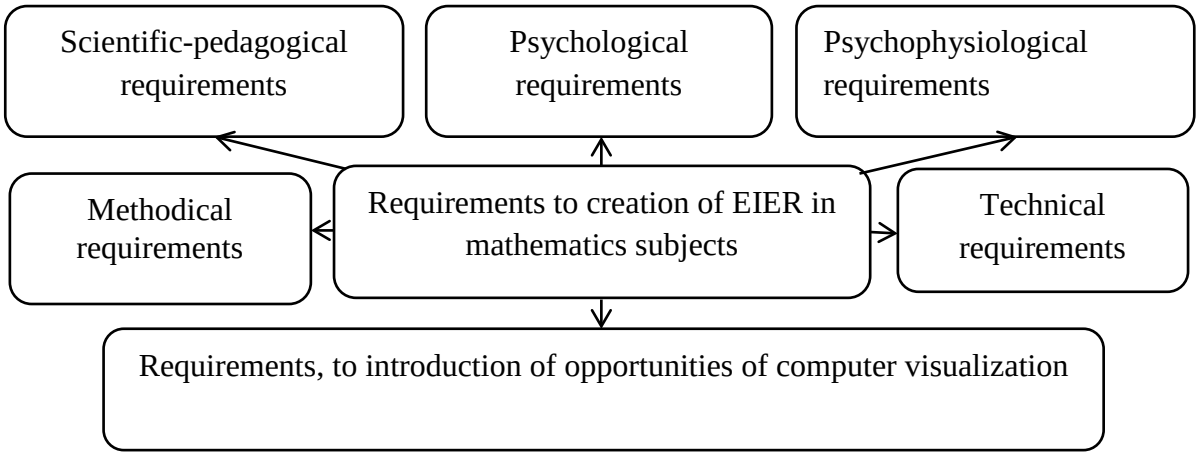

Table 1 Structure of requirements to creation of EIER in mathematics objects Contents of the above-named requirements and their components are presented in the table

№	Requirements	Contents of requirements
1.	Scientific character	The relationship of learning in the subjects of mathematics through EIER with modern teaching methods. These methods include: Experience, experiment, observation, classification, abstraction, generalization, classification, comparison, analysis and synthesis, modeling, mathematical modeling.
2.	Focus on achievement of goals	EIER should contribute to the deepening and sophistication of educational material presented in mathematics textbooks, taking into account age features of learners.
3.	Ensuring problematical character	Representation in the problem tasks and exercises directed to activization of thinking of learners
4.	Ensuring presentation	Consecutive assimilation of theoretical knowledge and mastering receptions of the solution of tasks in mathematics has to be carried out at the expense of opportunities of personal observation behind processes by means of visual representations.
5.	Consciousness of assimilation	The ultimate goal of learning activities of students is the use of obtained educational information, including through EIER, in independent work related to mathematics. While students must clearly understand the goals and objectives of their activities.
6.	Systemacity and sequence	Consecutive assimilation by recipients of formation of mathematical knowledge, skills on the basis of a certain system means.
7.	Coordination	Recipients of education have to seize knowledge, skills of mathematical disciplines by means of EIER taking into account their concrete interrelations
8.	Interactivity	It is expected to ensure interaction of students and EIER in the process of learning objects in mathematics.
9.	Consolidation of learning	The inclusion EIER examples and problems, helping to strengthen, deepen and retain in memory the teaching

		material and the development of mathematical abilities of students
Psychological requirements		
1.	Performance	EIER on mathematics have to be developed taking into account development of mental processes: thinking, attention, representations, storing, etc.
2.	Accounting of age features	Electronic resources on mathematics are formed on the basis of the basic knowledge which is available for learners in certain age.
3.	Development of figurative and logical thinking	The materials EIER on mathematical disciplines have to be focused on development of figurative and logical thinking of learners
Psychophysiological requirements		
1.	Observance of necessary illumination	During creation of EIER on mathematics it is necessary to use the colors, drawings, animation effects which aren't causing visual tension
2.	Psychological stimulation	In resources materials it is expedient to apply the records encouraging learners for the performed task (for example: "We congratulate on successful passing of testing" or: "You have made some mistakes, recommend to double-check the decision")
3.	Prevention of negative emotions	It is necessary to avoid the appearance in the material inaccuracies, mistakes that can cause a negative effect on learners (especially in tasks for independent performance, samples of work, questions for self-evaluation)
Methodical requirements		
1.	The presentation of training material	Training materials EIER in mathematics is intended for presentation should be based on the principle of interrelation of components: accessible, vivid and dynamic
2.	Sequence of assimilation of a training material	Training materials of EIER need to be given taking into account a possibility of control of their stage-by-stage assimilation in different forms
3.	Logical interrelation	It is necessary to provide accurate structure of training materials of EIER, and first of all due to logical interrelation of subjects
Requirements to realization		
1.	Presentation of training materials	Implementation requirements of systemacity and functional communication of the represented materials EIER on mathematics
2.	Completeness of coverage of training	Ensuring full volume and the continuity of training in mathematics with use of EIER
3.	Information processing	Development of mental abilities of recipients of education, formation of abilities of adoption of independent decisions in them in difficult situations, processing of information obtained by means of EIER on mathematics
Technical requirements		
1.	Opening browser by choosing	Opening of EIER on mathematics without difficulties in browsers at the choice (Opera, Mozello, Internet, Explorer)

2.	Degree speed download	Speed and faultlessness of loading when using EIER in mathematics objects
3.	Update information	Teachers or experts in mathematics have to have an opportunity to use information technologies for the purpose of obtaining the updated data
4.	Printing information received on paper	Granting an opportunity to print the necessary information on mathematics on paper
5.	The implementation of the transfer of information	Use of a possibility of transfer of information on any format

When training in mathematics with use of Internet a specific environment in which regularities and rules of telecommunication work is created. Can be forms of communication correspondence by e-mail, discussion at forums, chats or in real time (conference online). Therefore, organize mathematics lessons in the distant form, it is necessary to consider features of the information and education environment and the form of communication in this environment. The organization of educational activities on a network is connected to certain difficulties, especially for the teachers and learners only beginning to work on the Internet.

For example, during the work in the on-line regime of people feels some helplessness: the silence, control of the speech, impossibility aloud (orally) to express the thoughts. At forums at communication of the teacher and learners there can also be difficulties - shyness of learners, inability to quickly create answers to questions and also difficulties in establishment of natural communication between participants of educational process, when performing independent work of learners with a training material.

Organization of effective mathematics teaching in the information educational environment requires, on the one side, considering the peculiarities of telecommunication communication, and attention to the individual characteristics of human behavior in this environment.

To expand the new environment for the study of cycles and mathematical Sciences in the global Internet creates text information, audio-video files (Cantasio Studio, Ashampoo Burning Studio), questions for self-evaluation and questionnaire the questionnaires (i Spring, my test, Uneversal test), visual materials (Maple, Mathcad, Matematika, 3 d Studio, Macromedia Flash), practical programs to solve math problems (Delphi, C++, Java, Java script, macromedia flash). Skills in these software tools the students need to form.

We recommend you to use when creating EIER model placed on the Web-portal the Global Internet for the study of mathematics (Table 2)

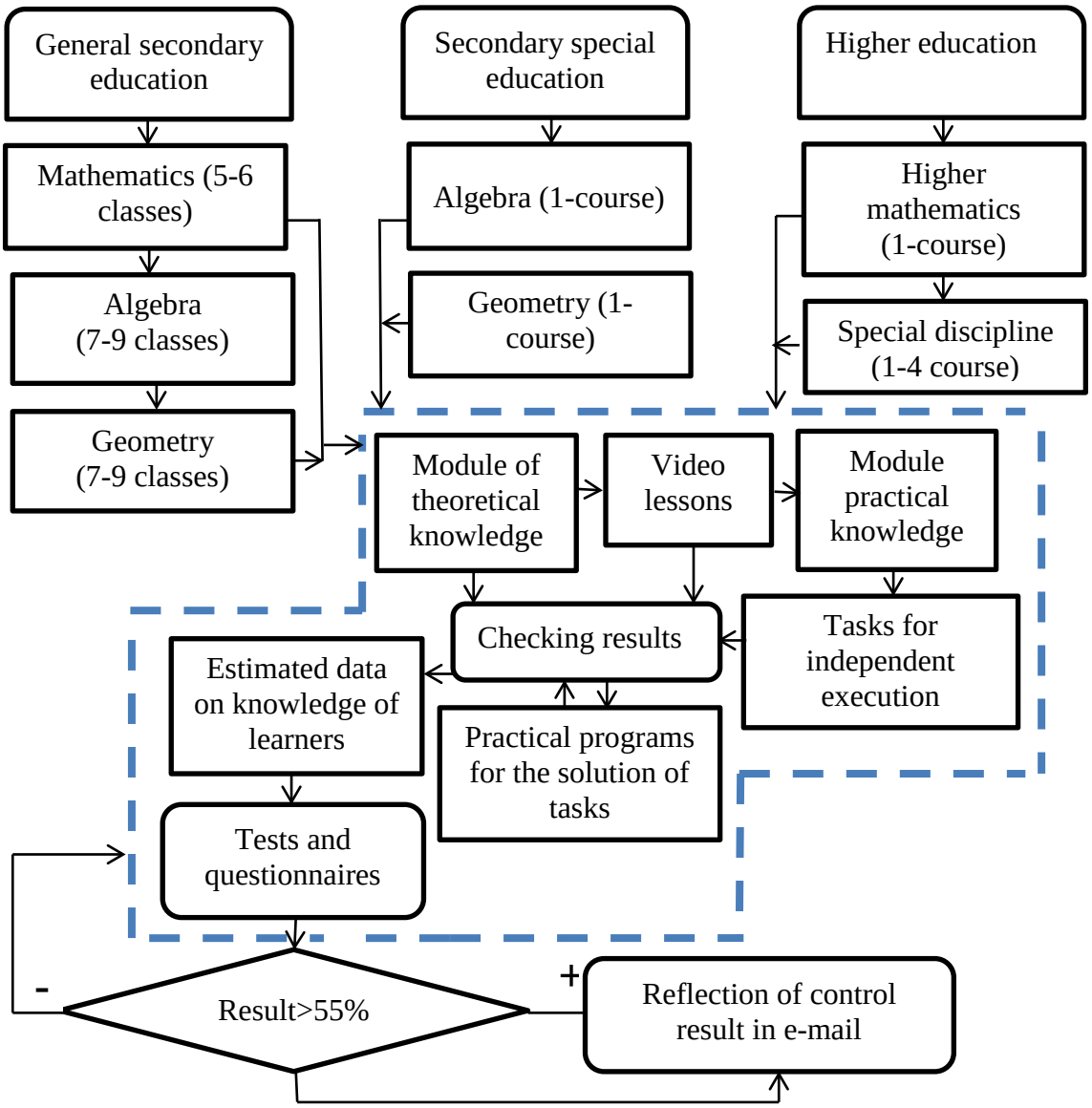

Table 2. Web portal model in subjects of a mathematical cycle

For creation of the Web portal of the model given above it is necessary to place in EIER stages of its realization which to be as follows:

- choice of a subject of occupation;
- definition of the purpose and problems of presentation of a training material;
- allocation of blocks, (sections, stages) taking into account hyper communications of sections of subjects of the presentation for the purpose of expansion of developments of small subjects;
- selection and preparation of a training material (the drawings, schemes accompanying the text of the presentation), at the same time special attention is paid to explanation of terms;
- color scheme at material registration (taking into account psychophysical impact of color on contents perception);
- development of "title page" of the presentation;
- introduction of the plan educational information;

- drawing up the main questions necessary for consideration, to a training material in general and to parts;
- development of the short summary to the main sections of a subject;
- formulation of conclusions on presentation material;
- preparation of information for feedback.

In conclusion, it should be emphasized that the implementing EIER in the subjects of mathematics in the global Internet enhances the effectiveness of teaching mathematical disciplines in a number of areas: creates opportunities for independent exploration of the subject, find relevant information on the topic, verify the solution of examples and tasks, implementation of self-control by means of tests and quizzes. Furthermore, the use of electronic information-educational resources in mathematics saves time of students helps to develop and expand their worldview.

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Pupils' Speech Interaction in Various Stages of Education and Development Their Creative Intellection

Key words: *literary education, speech development, creative activity, interaction, continuity, intellection, educational stages.****Annotation:*** *this research deals with changes in pupils' speech and creative activity in various stages of education, pays significant attention to the changes of students' intellect in respect of young features. The author approaches pupils' speech and the development of intellection on the example of the subject Literature, as teaching approach the concept of interrelation and continuity are defined. Methodological instructions are given with the object of provision interaction development of pupils' speech.*

Although the development of pupils' speech and improvement are taught in respect to the language, fostering speech perfection in the field of Literature regards as the main condition in complete acquisition of literary speech and intellection. These days speech development, perfecting speech manner, forming creative intellect is considered as one of normality of pedagogic activities in the perfect personnel training.

Well, how do the speech, speech manner and creative ideology interrelated? Speech is a language expressing the idea and following exchanging process which is the exact form of living as a separate social type of a function. Speech manner considers as mastering oral and

written literary language norms, furthermore, capability for particular use of the object and concept of speech in various communication interacted conditions by means of fine arts (3).

Intellection is the greatest form of human's mental activity; the process reflecting objective phenomenon to the consciousness. Intellection appears as a consequence of the language and speech interrelation (4). Thus, creative intellect is reflected in both speech perfection and creative works such as inventions, innovations and some other human's intellectual products.

Developing students' oral and written speech is one of the significant branches in literary education. Along with introducing literary works it intends to enrich learners' vocabulary, develop constrained speech and teach to express it in practice, these main tasks is started at kindergarten, preschools, secondary schools and vocational schools; mainly they are settled by teachers. To this purpose the question arises in the provisions of pupils' speech and in the development of their creative activities.

In the frame of the subject literature students do project work, for instance, creative work, that is the observation of any natural phenomenon or moving events, hold practical experiments, conduct various research work in real conditions. Therefore, there is a need to implement educational methods by teachers concerned with the process of teaching literature, and pupils' creative initiatives and develop perception activity and modern improvement of literary education on the scientific basis in secondary schools and continuous educational systems which regards as a substantial component of academic lyceums and vocational colleges.

Literacy has been regarded as the state requirement tasks to form and develop fluent speech skills both oral and written in preschool education, elementary "Mother tongue", "Reading", "Ethics" and other subjects are reflected in curriculum and syllabus in all manuals of the subject literature designed for secondary schools. For example, the following significant hypothesis has been mentioned particularly in the constrained manual on the speech development and teaching creative activities at the head of co-authorship by Tukhliyev B., Karimov B. "It highlights literature teaching tasks as to awake students' love to fiction, to foster them reading wonderful novels, comprehending and being able to analyze, to bring up them to express freely literary text both oral and written" (2).

On the one hand the academician signifies a number of tasks in teaching literature according to the standard manual made up Tukhliyev B, Ahmedov N. namely on the subjects "Literature", "The laws of Literature", "Folklore":

"- To form and develop motivation in reading fiction and comprehending it;

- To acquainting with literary text and on the basis of analysis develop their oral speech and written skills etc (3).", on the other hand the academician proposes not to put in the frame students in the accord with one of the main requirements in the syllabus made up by Rafiyev A. R., Ghulomova N. intended for lyceums and vocational colleges, but to broaden their outlook, to give an opportunity to express freely their point of views and think independently, direct them to thinking. Here it doesn't imply to conduct the only thought and conclusion, but emphasizes to attain each student's view point and approaches (1).", which requires students' speech experience and skills, independent thinking and creative intellect rise through passing from secondary school to secondary specialized and vocational college.

As long as with this while authors are introducing themes in mannuals and setting requirements they should take into consideration not only students' age and individual features with distinctions but also they ought to consider how the fiction lamguage is becoming complicated of methods at higher grades (especially at 1 course in the lyceum). In the process of conducting researech we witness that some students are completely unprepared for the analysis of these kind of works, have very low speech development and the intellect, are in need for the support of the teacher in various creative processes. It is crucial to eliminate mentioned students' drawbacks not at academic lyceums and vocational colleges but at preschool education.

These days, textbooks on reading, ethics significantly constitute all fundamental approaches in practice for students' speech development, continuity to form creative intellect, provision of non-stop education. Yet, we find complicated the number of intended creative assignments for the pupils of preschool grades (supplementing well-known stories, essay writing on fictional topics, writing stories, writing commentaries etc.). However, we cannot repudiate entirely from these kind of creative work because it is considered as the process in which the teacher solves academic issues based on methods referring to logics starting from simple to consequence.

At preschool education pupils are lack of speech attainment and have not enough skills, in the process of teachers activity of the 5th grade they face a number of difficulties to embody these work. For this reason, apparently it becomes demanding issues to recommend the tasks as manuals and literatues for prescool education in order to work out apparent methodology to educate pupils on the ground of continuous and step by step methodic.

Thus, in spite of having been enough illuminated degree of continuity, non-stop education with manual provision, development of pupils' speech and creative activity on academic materials, the process of embodying the number of creative work causes issues because of the lack preparedness of preschool pupils in practice. We can conclude the following according to the analysis of programs on exact intended textbooks on reading, ethics and literature for the 5th grade pupils:

- It encounters complicated enough to form reading techniques of pupils and covers large-scale literary material;
- Pupils are in need for the acquisition in wrting creative work, theoretical perception to answer different questions;
- These resources will bear complicated pupil's spirit, doubtless great distinctions between two stages.

In eliminating abovementioned conditions teacher's skills of being able on setting pupils to the right track serves as the main means to improve their speech and creative intellect, control and develop pupil's the way of thinking. An educator is an ideal source of imitating for educators to the speech development, form moral virtures at nursery schools whereas in preschools it changes a little and the class teacher substitutes it. After pupils passing to secondary school with the multifying sources of imitation (teachers of various subjects) the teacher with a greater influence leads pupils in the frame of his/her subject to an appropriate thinking development.

In secondary schools this process is greately seen in the role of the teacher in mother tongue and literature which is in this stage of education can become the important factor of easy acquisition of other subjects, influences on free thinking and pupils will have their own conclusive thoughts.

In order to activate pupil's free intellect the teacher of Literature of the 5th grade should use each new up-to-date academic material which is widely in use. Firstly, the teacher conducts a theme of the textbook (fiction), secondly he/she arises the problem of the literary work (e.g. a put forward idea of moral virture), pupils find out the ways out to solve the issue. Then the teacher asks them to describe freely the idea of the novel, and herself gives instructions to obtain the solution. Having listened thoughts about the idea of the novel, compiles presented views and instruct them to find out the right one among ideas. The right set of speech in the frame of the lesson is the crucial factor of the speech development and creative activities. As soon as the human encounters a real problem the process of thinking intensifies and intellect becomes more active. In this case, the teacher should give several solutions leading them to a right thinking and avoid possible far-fetched conditions from the precision as a result of many given conclusions. Having used this method we have obtained productive result.

Furthermore, at every stage of secondary school education it is efficient to use some didactic games in the process of literature lessons, organization of lessons makes pupils develop their speech and form their free thinking and provoke to creativity.

For example, the game "Word-assignment", purposely the teacher gives at least ten or fifteen words in pairs and suitable four words with them to check their memories about the previous studied theme. One out of four words in the list should match the first word. For instance, "Three brothers-valiant" word assignment: Valiant are five brothers, three brothers, four brothers, two brothers; Little Valiant is a story, a poem, a rhyme, a fable; A story – a jackdaw, a parrot, quail, a bird etc. In addition, we have convinced in the experiment that conducting games on the basis of continuity such as "Finding words", "Telling the meaning of proverbs", "Brainstorming", "Making up questions", "Continuing the story", "Imagery events" will educate pupils to achieve our target in the speech development and improvement of creative activity.

We have considered that in directing pupils' speech and creative activity at academic lyceums and vocational colleges it is important to mind their features in emerging changes, joining the row of adults, willing to find the justice in life, taking into consideration their psychology to teach philosophical norms of thinking towards the fiction, the writer's life and activity. Mainly, a pupil should comprehend, think and after make conclusions for himself. While teaching fiction provided a teacher induces the motivation to the pupil willing to know the notion and phenomenon, cause and effect of various kinds of knowledge acquisition can lead to success, provide and develop student's active intellect. It will conduct to comprehend entirely the idea of learning literary work. As long with it the teacher chooses didactic types of games for pupils paying attention to their young and individual features.

Overall, the process of development pupils' speech and creative intellect in secondary schools, secondary special scools, vocational colleges is the basis of continuity and non-stop education

at every stage of education, because pupils passing stage by stage their view point are becoming complicated which requires the achievement scientific outlook of pupils's speech and creative thinking.

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Antropology

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Theoretical Basis for Formation Students' Natural-Science Outlook

Key words: *student, process, "Evolutionary doctrine", natural-science worldview, upbringing, personality.*

Annotation: *the article is devoted to the study of the problem of forming a natural-science worldview of students, which occupies a special place in personal development. To date, it has become necessary to educate students to express their opinions and make firm decisions, to understand the essence of phenomena and processes occurring in nature and society, to think independently and creatively, to apply the knowledge and skills obtained in problem situations and draw appropriate conclusions.*

Глобализация информаций, внедрение её с высокой скоростью во все области общества, безпрерывное обновление производственных технологий, интеграция точных, естественных и гуманитарных наук, условия, предъявляемые к организации процесса обучения и воспитания на основе современных подходов и новых парадигм требуют усовершенствовать преподавание всех курсов, в том числе и биологических наук в системе высшего образования.

В республике перед системой беспрерывного образования, в частности, системой высшего образования поставлены следующие задачи: вырастить и воспитать личность; подготовка конкурентоспособных кадров; не ограничиваясь освоением студентами знаний, навыков, квалификаций, предусмотренных в ГСО, развивать у них самостоятельное мышление и творческих способностей, расширять кругозор путём создания сильных учебных мотиваций, развивать интеллект и профессионализм (1).

В преподавании в высших учебных заведениях биологических курсов, в частности “Эволюционного учения” есть возможность преподнести происхождение и развитие жизни, биологических процессов, происходящих в живых организмах с точки зрения достижений современной науки. На занятиях по курсу “Эволюционное учение” изучаются знания, идеи, закономерности, теории, гипотезы; путём применения их на практике идет переработка в сознании студентов, осмысление их сущности, развивается сознательное и положительное отношение к окружающей среде на основе научных гипотез, фактов, биологических закономерностей.

Проблема формирования научного мировоззрения у учащихся в процессе преподавания биологии разработан на примере общих образовательных школ. Данная проблема нашла

свое отражение в исследованиях Н.М. Верзилина, В. М. Корсунской, Е.П. Бруновт, А.Н. Мягковой, Д.И. Зверева, А.Т. Гафурова, Дж.О. Талиповой.

Проблема формирования естественнонаучного мировоззрения у студентов высших учебных заведений еще не исследована и возникла

необходимость разработать эту проблему в системных и концептуальных аспектах, принимая во внимание интеграцию естественных наук, с помощью внедрения в процесс обучения и воспитания инновационных технологий.

В ходе исследования была разработана модель формирования естественнонаучного мировоззрения у студентов.

Известно, что моделирование – считается методом исследования объекта, т.е. части социального и естественного мировоздания на аналогичном моделе (2).

Принимая это во внимание, основу модели формирования естественнонаучного мировоззрения студентов составляет мировоззрение совершенной личности и она состоит из нижеследующих составных частей:

1. Проектирование процесса формирования естественнонаучного мировоззрения у студентов. В проектную часть модели включены примерный и рабочий учебный план, примерные и рабочие учебные программы естественных наук, нормированные ГСО, самостоятельные работы и самостоятельное обучение студентов бакалаврского направления. Содержание процесса формирования естественнонаучного мировоззрения студентов. В содержание внесены закономерности, законы, идеи, знания, понятия, которые занимают место в программе естественных наук и являются основой научного мировоззрения; учебные, практические и трудовые навыки; опорные и частные компетенции, сформированные на основе убеждений и традиций.

2. Организация педагогического процесса, направленного на формирование естественнонаучного мировоззрения студентов, на основе модульного подхода. В преподавании “Эволюционного учения” были использованы формы обучения: лекции, лаборатории, практические и семинарские занятия, локальные и частные методические технологии, а также, видеофильмы, электронный учебник, состоящий из анимаций и мультимедий. Для активации учебно-познавательного процесса студентов применялись стандартные и нестандартные учебные и тестовые задания.

3. Контролирование и оценка результатов по формированию естественнонаучного мировоззрения студентов. В качестве критерия определения уровня формирования естественнонаучного мировоззрения студентов были приняты овладение знаниями и идеями, составляющими основу мировоззрения и степень систематизированности и обобщенности этих знаний и идей. В ходе процесса были составлены тестовые задания различной степени сложности и с помощью My test были переведены в адаптивные тесты (3).

Благодаря моделированию процесса формирования естественнонаучного мировоззрения студентов, был всесторонно и глубоко

изучен учебно-воспитательный процесс, осуществлены контроль и оценка результатов на каждом этапе процесса.

Модель дала возможность точно представить процесс формирования

естественнонаучного мировоззрения и выявила взаимосвязь между всеми составными частьями процесса. Спроектирование модели в соответствии с поставленной задачей дало возможность осуществить дидактические задачи, предусмотренные процессом.

В составлении модели по повышению степени формирования естественнонаучного мировоззрения студентов, придерживались нижеследующим принципам:

- научность;
- непрерывность;
- систематичность и преемственность.

Содержание и структура модели были составлены исходя из дидактических целей и задач, предусмотренных обучением биологических учебных курсов в бакалавриате.

Организация процесса формирования и развития естественнонаучного мировоззрения студентов целесобразно, по этапно и непрерывно, требует создания следующих педагогических предпосылок:

- соответствие содержания процесса формирования и развития естественнонаучного мировоззрения студентов с поставленной целью. По трем направлениям, содержащихся в биологических курсах: организм как биологическая система, экологические системы и эволюция органического мира, были определены индуктивные и дедуктивные логические направления формирования и развития естественнонаучного мировоззрения студентов. Были разработаны рекомендации по развитию научного мировоззрения в обучении учебных дисциплин в бакалавриате;

- определение путей осуществления интеграции точных, естественных и биологических дисциплин, предусмотренных в учебном плане. Определены пути осуществления горизонтальных и вертикальных межпредметных взаимосвязей; науки, возникшие в результате интеграции дисциплин в процессе формирования и развития естественнонаучного мировоззрения студентов;

- пробуждение у студентов внутренных учебных мотивов и интереса к освоению биологических знаний с помощью использования инновационных технологий в преподавании биологических дисциплин. В ходе исследования были использованы локальные (мозговой штурм, кейс стади, цепочка терминов, проблемные учебные задания) и частные методические (дидактические игры, проблемное обучение, модульное обучение и совместное обучение) технологии в процессе обучения и воспитания курса Эволюционное учение (4);

- подготовка дидактических и раздаточных материалов, способствующих активации учебно-познавательной деятельности студентов;

- организация самостоятельных работ и самообучения студентов в соответствии с поставленной целью и применением интерактивных методов;

- использование эффективных методов контроля и оценки знаний и навыков, освоенных студентами, и тем самым обеспечение справедливости и широкомасштабности данного процесса.

Нижеследующие были определены как концептуальная основа в формировании естественнонаучного мировоззрения студентов:

- основу естественнонаучного мировоззрения студентов составляют научные знания, практические навыки, опорные и частные компоненты;

- формирование в процессе обучения и воспитания закономерностей, законов, идей, знаний, понятий, касающихся научного мировоззрения, с применением инновационных технологий; обращение внимания на формирование биологических, учебно-практических и трудовых навыков, убеждений, традиций на основании принципа единства теории и практики.

- использование проблемных ситуаций, позволяющих студентам применять освоенные ранее знания, навыки в новой и непредвиденной обстановке и обучаться новым знаниям и навыкам.

- обращение внимания на межпредметные и внутрипредметные взаимосвязи в процессе формирования у студентов общих и частных понятий в ходе изучения каждой биологической дисциплины.

- достигнуть того, чтобы студенты овладели навыками систематизировать, прогнозировать, проектировать и обобщать материалы по происхождению и развитию органического мира.

Подводя итог, нужно подчеркнуть, что определение содержания обучения в соответствии с целью, осуществление интеграции дисциплин, использование локальных и частных методических технологий в преподавании курса “Эволюционное учение”, проверка достигнутых результатов с помощью стандартных и нестандартных учебных и тестовых заданий занимают важное место в процессе формирования естественнонаучного мировоззрения студентов.

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Formation Legal Culture of Future Employees of Customs Bodies on the Basis of Acmeological Approach

Key words: *acmeology, acmeological science, princip, customs, development, customs authorities, creative individuality.*

Annotation: *the creation of a fully modern system of legal culture, education and training for building a constitutional and democratic state and the formation of civil society is one of the most important tasks of today. The article on the basis of the acmeological approach covers the issues of formation of the legal culture of future employees of the Customs authorities.*

Acmeology, being a newly developing science of world scale, is a modern branch of science, isolated from the subject of human studies, which deals with human problems, and its most important aspect is the study of various contexts of problems of increasing the creative level of the profession and specialty.

The lexical meaning of the word “acmeology” comes from the Greek words “Akme” – perfection, exaltation, development, peak, and “logos” – teaching, education, instruction, in other words, acmeology studies the problems of achieving high levels of man in the process of profession, at the same time, it studies the periods of achievement of human perfection, elevation, development, peak in their professional activities and the processes of their development.

The essence of acmeology consists of studying the contexts of striving for perfection and maturity in harmony with a number of disciplines in order to spend on fulfilling the obligations and duties of their creative activity, deep awareness of serving the profession to enhance the positive influence to the development of society, prosperity of nation, welfare of life and economic, political, moral and legal sides of social progress and, in this respect, acmeological science in partnership with such branches of science as philosophy, sociology, genetics, psychology, pedagogics, ethics, aesthetics, valeology, gerontology is focused on finding their direction, problems and their solutions.

The study subject of acmeology on the basis of objective laws covers the methodological, technological and humanitarian aspects of the profession and creative activity.

The directions of acmeology include:

1) General principles of acmeology;
2) Professional acmeology (pedagogical acmeology, military acmeology, social acmeology, school acmeology, medical acmeology);
3) Managerial acmeology;
4) Creative acmeology;
5) Synergetic acmeology;
6) Educational acmeology;
7) Correctional acmeology;
8) Ethnological acmeology.

Awareness of the essence as well as social and philosophical significance of acmeology requires from every future employee of customs authorities in-depth study of science, a choice of profession with deep responsibility and faith, taking into account his abilities, character and potential, to approach profession with love and conviction. Acmeological approach explores the achievement of the highest professional skills and results, as well as issues and problems of retraining and advanced training. The essence of the acmeological approach is determined by strengthening professional motivation, stimulating creativity, identification of personal opportunities for success in professional work and the desire to make productive use of these opportunities.

The future employee of the customs authorities must conscientiously fulfill their duties and awake feelings of love for the motherland, hone their will, develop the qualities of determination, steadfastness, endurance and forbearance and constantly be in search and strive for maturity to improve their creative thinking, to realize the essence of their chosen specialty from the point of view of the interests of society, nation, motherland. These qualities should be further developed in the minds of future employees of customs bodies, and it is necessary to transform the moral, psychological, legal, aesthetic and valeological foundations of acmeological approaches to their future goals, the meaning of life, the essence of life, action, consciousness and thinking. In this case, they become highly cultured, highly moral people and reach their acme-peak.

Ananiev B.G. (1), Derekach A.A. (2), Kuzmina N.V. (3) and others discuss creative periods, stages of the maturity of human life mixed with increasing the effectiveness of professional activity. They dealt with the issues of professionalism of mature people, mental regularities in the period of the prime of personality development, transition of the heights of professionalism achievement.

Slastenin V.A. substantiated subjective and objective factors leading to high professionalism, to a long creative life of a specialist. He classifies the quality of received education to the objective factors, and to the subjective factors – talent and abilities of the person, responsibility for the effective solution of production problems, approach to specialists (4).

The following are indicated as factors for achieving high professionalism: *talent sprouts*; *intelligence*; *ability*; *talent*; *family education condition*; *educational institution*; *own actions*.

Acmeology, from a scientific point of view, comes under review in terms of professionalism and creativity. At the same time, the following categories are distinguished: *creative individuality*; *process of self-development and self-perfection*; *creative experience as implementation of their own capabilities*.

Slastenin V.A. defines the main tasks of the implementation of creative individualism in the following ways:

— enrichment of socially significant culture;
— updating the pedagogical process and knowledge of the individual;
— search for new technologies that determine effective and meaningful standards;
— ensuring the self-development of the individual on the basis of self-determination and self-realization of the individual (4).

Legal culture is an integral part of a common culture. The legal culture is the level of legislation of the society, the awareness of existing laws, observance of the people of legal norms and its irreconcilability to people that do not fulfill these standards, implementation by the state of the legal policy appropriate to the people and society, availability of highly developed legal science, broad and active legal consciousness, mastering of knowledge about the state and law by members of the society, awareness of the population of rich legal experience, legal mechanisms, implementation of rights.

Education of future customs officers consists of formation of patriotism, universal and national values, education in the spirit of loyalty to the independence of Uzbekistan, education of a highly spiritual, legal, moral and cultural, truthful and honest employee with a sense of personal responsibility in the performance of official duties and taking into account the characteristics of the work of Customs employees, development of our homeland in socio-economic and political spheres, constant increase of knowledge of future customs officers mental, moral, professional and physical areas is dictates of the time.

Acmeological approach at the peak of the professional ability of the trainee reveals the patterns of development of ones personality and fulfills the following main tasks while improving the legal culture of future employees of customs authorities:

1) Basic vocational training of personnel, mastering of knowledge at the level of modern requirements, retraining and upgrading of the skills of customs officers, as well as the formation of sustainable moral and psychological merit of students for the performance of professional duties;

2) Education of socially active, honest employees who are able to conscientiously protect the economic security of the Republic;

3) Ensuring the practical orientation of the teaching and education process at a high level to solve problems before the customs authorities, as well as continuous improvement of teaching and education process through the introduction of modern teaching technologies, interactive forms and methods of practical training;

4) Organization and implementation of scientific research in the field of customs, preparation of recommendations on improving the forms and methods of activity of customs authorities;

5) Study and implementation of advanced foreign experience of training personnel for customs authorities, establishing links of this profile with training departments of foreign countries for practical and methodological exchange;

6) Organization of effective works on moral and spiritual education, on combat and physical training of students.

In conclusion, we can conclude that on the basis of the acmeological approach, it is necessary to transform legal knowledge and the right worldview considered to be a high level of legal culture of future employees of customs bodies into legal conviction, especially while forming such a legal conviction they actively act in the social and legal field, with this they will be ready to protect not only their own, but also the rights of people around them, the whole society.

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Pedagogics of Mutual Cooperation in Social and Humanities Education as Factor in Ensuring Education Quality

Key words: *Pedagogical cooperation, management apparatus, humane, criterion, indicator, directions of implementation, degree of implementation, factor, quality of education.*

Annotation: *The article presents the results of scientific and pedagogical research on the creation of theoretical foundations of pedagogical cooperation. Also features of the basic principles and conceptual bases of definition of criteria of an estimation of degree of use of ideas of pedagogical cooperation in practice, directions of introduction, a degree of their introduction into practice are opened.*

Время перемен, в котором мы живем, в жизни общества осуществляются сложные, но требуемые временем коренные социально-экономические реформы. Осуществление таких масштабных перемен в обществе, экономике, вообще во всех сферах нашей жизни требует перемен и в самих себя, т.е. познание самого себя. Не будет преувеличением, если скажем, что данный вопрос является самым трудным из всех поставленных задач.

Успешное выполнение таких сложных вопросов, требуемых временем, ставить перед нашим поколением актуальную задачу освоения новых знаний и применения их на практике.

После обретения независимости, наша страна четко определило свой путь развития, которая заключается в таких целях как создание демократического правового государства, социально-ориентированной рыночной экономики и сильного гражданского общества. Приоритетом широкомасштабных реформ, осуществляемых в данном направлении является человеческий фактор, его интересы. Приоритетным направлением данной политики является воспитание физически здорового, духовно совершенного, обладающим современными знаниями, самостоятельно мыслящего, уверенного на завтрашнем дне гармоничного поколения.

В пункте 3.2. “Национальной программы подготовки кадров” особое внимание уделено развитию общественного управления в создании необходимой условий для получателей образования, а в пункте 4.4 программы - взаимодействию образовательных учреждений, родителей, махаллинских комитетов, социального движения молодежи “Камолот”, многочисленных общественных организаций, фондов в целях формирования личности, верной принципам независимости Республики Узбекистан и сумеющей внести свой вклад в развитию общества (1).

Постановление Кабинета Министров Республики Узбекистан №175 от 19 июня 2012 года, “Концепция взаимосотрудничества семьи, махалли и образовательного учреждения при воспитании гармоничного поколения”, утвержденной протоколом №1 заседания Общественного совета “Семья, махалля и образовательное учреждение” при Министерстве образования создало необходимость внедрения педагогики взаимосотрудничества в учебно-воспитательный процесс.

Главная цель концепции взаимосотрудничества направлена на нахождение своего места в жизни каждого ребенка, создание условий для своего счастья, воспитание ребенка, чувствующего ответственность перед родиной, человеколюбивого.

Качество социально-гуманитарного образования зависит, в первую очередь, от нижеприведенных важных факторов:

- со стороны преподавателей социально-гуманитарных предметов организация уроков, эффективно используя созданных условий на основе современных требований, а также информационно-коммуникационные технологии;
- эффективное внедрение образовательный подход, направленный на формирование компетенций получателей образования – необходимых знаний и жизненных навыков, развитие личности ребенка;
- организация учебно-воспитательного процесса на основе принципов педагогики взаимосотрудничества;
- эффективное осуществление методической услуги, основанной на педагогических потребностях обучающегося;

- системное наблюдение за динамикой освоения со стороны обучающихся знаний, навыков и квалификаций, определенных государственными стандартами образования, выяснение пустоты в знаниях обучающихся и причины их возникновения, а также эффективное осуществление мер по их устранению.

Спецификой современного экономического и социально-политического развития состоит в том, что со стороны нашего общества ставятся все новые и новые требования по развитию каждой личности. В связи с этим, основное внимание педагогического сообщества направлено на координацию и совершенствованию деятельности всех социальных институтов, участвующих в педагогических процессах.

В настоящее время актуальность проблемы педагогики взаимосотрудничества основаны на нижеследующем:

Во-первых, осуществление социальных и педагогических процессов (гуманизация и демократизация отношений, усиление человеческого фактора, улучшение качества образования на основе инновационных процессов, повышение внимания образованию, образовательным учреждениям и их проблемам, и т.д.);

Во-вторых, состояние общей, массовой педагогической практики (оказание педагогической поддержки преподавателям и обучающимся не на должном уровне, их неудовлетворенность учебно-воспитательным процессом, со стороны преподавателей непонимание, незнание, в некоторых случаях нежелание необходимости изменения отношений к обучающимся и другие);

В-третьих, стремление педагогов-практиков к инновациям (разработка и внедрение в практику инновационных технологий образования, направленных на развитие личности ребенка и другие).

В большинстве научно-исследовательских работ понятия “взаимосотрудничество”, “партнерство”, “координация”, “совместное действие” используются как синонимы. По нашему мнению, понятие “взаимосотрудничество” является более обширным, принимается как совместное действие для достижения целей.

Анализ направлений педагогики взаимосотрудничества и изучение практики и опыта в настоящее время показывает на необходимость разработки в системе общего среднего образования модели управления качеством образования на основе педагогики взаимосотрудничества, направления внедрении на практике и определения степени внедрения принципов и концептуальных идей педагогики взаимосотрудничества, критерий и показателей оценки эффективного применения на практике основных принципов и концептуальных идей педагогики взаимосотрудничества, а также организационно-педагогических условий по совершенствованию управления качества образования на основе педагогики взаимосотрудничества (2).

Критерии и показатели социально-гуманитарного образования на основе педагогики взаимосотрудничества

Критерии	Показатели
Основные принципы и концептуальные идеи педагогического взаимосотрудничества	роль личности педагога в учебно-воспитательном процессе; современные научные исследования, изучение литератур и передовые опыты; использование современных информационно-коммуникационных технологий; участие в республиканских, областных, городских, районных мероприятиях, конференциях; постоянное, непрерывное повышение квалификации, ведение исследовательских работ; подготовка статей для средств массовой информаций по соответствующим направлением.
Взаимосотрудничество преподавателей и обучающихся в учебно-воспитательном процессе	успех обучающихся (достижение результатов) - основное условие образования; получение образования всеми детьми независимо от их возможностей; совместное осуществление творческой деятельности; постоянный обратный связь; не допущение противоречий в процессе образования; удобства в классных комнатах для обучающихся; обучение с разделением по группам; освоение уроков путем повторений и закреплений; не допущение принуждать к обучению; предотвращение не освоения и перенапряжения; обучение дополнительных тем для лучшего понимания обучающихся; обучение теоретических материалов по крупным блокам; обучение к самостоятельному управлению; положительно оценить освоение, действия обучающихся; предупреждение об ошибках; обеспечение постоянного повышения знаний и квалификаций преподавателей и обучающихся.
Взаимосотрудничество преподавателей и обучающихся в процессе воспитания	личность ребенка – основная ценность и главный объект-субъект для преподавателей; стремление самостоятельному воспитанию и развитию преподавателей и обучающихся;

	принять во внимание индивидуальные и типологические характеристики всех участников образовательного процесса; внимание к себе, близким и вообще всем; соблюдение принципов гуманизма и толерантности в образовании; духовно-просветительское обогащение личности; командная творческая деятельность; создание возможностей для свободного выбора формы, содержания и способов работ, деятельности обучающимся; координация всех видов деятельности с родителями и всеми партнерами (органы самоуправления (махалли), общественные организации, правоохранительные органы, средне-специальные и профессиональные образовательные учреждения); самостоятельное управление.

В свете данных актуальных задач полный пересмотр, совершенствование содержания процесса повышения квалификации преподавателей социально-гуманитарных предметов и разработка стратегию развития в этом направлении приобретает важное значение, и служить обеспечению качества и эффективности социально-гуманитарных предметов.

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Transformation of Professional Education to Labor Market

Key words: *Secondary special education, professional education, competitive personnel, modern specialist, theoretical and methodological approach.*

Annotation: *The article focuses on the preparation of competitive personnel in the system of secondary special, vocational education. The author, as the priority tasks of the research, calls the theoretical justification of innovative and organizational-pedagogical forms of training competitive personnel, the definition of the pedagogical conditions for their practical application, and a number of other tasks required for experimental approbation.*

На текущем этапе реформирования в ряду приоритетных макроэкономических задач особо выделяются такие, как: повышение уровня конкурентоспособности отечественной продукции (товаров, услуг, кадров); значительное увеличение объемов производства потребительских товаров с целью насыщения ими внутреннего рынка и рост экспорта; более эффективное использование для развития сферы образования финансовых ресурсов, а также привлечение для этих целей обеспечивающих внешних источников финансирования образовательных отраслей, формирование самого главного богатства – “человеческий капитал”, плюс качественный и количественный рост которого во многом определяет долгосрочные перспективы развития страны.

Между тем, как показывают исследования, профессиональная педагогика оказывается не готовой к теоретическому обоснованию и практическому применению вхождения образовательной сферы в новый тип общественных отношений – социально ориентированную рыночную экономику – сложнейший организм, состоящий из огромного количества разнообразных производственных, коммерческих, финансовых, информационных и образовательных структур, взаимодействующих на фоне разветвленной системы правовых норм бизнеса и объединяющихся единым понятием – рынок.

В современных социально-экономических условиях профессиональное образование превратилось в один из важнейших социальных институтов общества, а категория “профессиональное образование” приобрела довольно сложную структуру. Она одновременно отражает систему учреждений, представляющих образовательные услуги и обеспечивающих результат: приобретение обучаемым специальности (профессии) с присвоением квалификации, а также сами формы, процесс и технологии обучения. Сложность этой категории определяется еще и тем, что она охватывает огромное количество и разнообразие способов человеческой деятельности, составляющих совокупный общественный труд, который по мере развития научно-технического прогресса приобретает более сложный, комплексный и наукоёмкий характер. Но нельзя односторонне измерять результаты профессионального образования только лишь экономическими параметрами. Оно является важнейшим фактором социального и личностного развития, обеспечения активной жизненной позиции, как социальных групп, так и каждого человека в отдельности, способом профессионально-групповой и индивидуальной самореализации (1).

В условиях экономических изменений и создания новых производственных предприятий, когда возникает существенный избыток рабочей силы, профессиональное образование становится важнейшим средством снижения социальной напряженности.

В ситуации, когда подготовленные специалисты не находят соответствующих рабочих мест, система профессионального образования демонстрирует свою неэффективность. Помимо материальных издержек система профессионального образования теряет связь с реальной практикой, не получая точной информации о потребностях рынка труда, в условиях отсутствия сотрудничества с работодателями.

Продолжающийся выпуск специалистов, не востребованных на рынке труда, повлечет за собой неэффективность деятельности профессионального образования как гаранта трудоустройства и успешной профессиональной самореализации.

В результате несоответствия спроса и предложения на рынке труда молодому спциалисту сложно войти в русло кадровой структуры экономики, естественно место трудоустройства не соответствует полученной специальности и уровню образования и/или молодые специалисты вообще остаются не востребованными, пополняя ряды безработных (2).

Интересы потребителей и производителей образовательных услуг в профессиональном образовании

	Потребители и производители	**Интересы потребителей и производителей**
	Органы государственного управления образованием	В максимально возможной степени поддерживать текущее и перспективное равновесное состояние между потребностями рынка труда и возможностями рынка образовательных услуг. Предоставить возможность выпускникам школ реализовать свое право на получение профессионального образования
Потребители образовательных услуг	Обучающиеся	Получить профессиональное образование, позволяющие иметь оплачиваемую работу
	Семья обучающегося	дать ребенку профессиональное образование, которое позволит ему иметь оплачиваемую работу
	Рынок труда	Обеспечивать постоянно возобновляюўиеся потребности многоотраслевой экономики в работниках за счет их качественной подготовки в системе профессиональгоо образования
	Общество	Получить работника, обладающего социально значимыми качествами личности
	Рынок рабочей силы	Получить работника, обладающего профессиональной компетентностью и профессионально значимыми качествами личности
Производители образовательных услуг	Обучающие	Обеспечить нормативный уровень образовательного процесса, необходимый и достаточный для овладения обучаемыми одной или несколькими специальностями (профессиями); самим иметь постоянную оплачиваемую работу по профилю своей профессии, что напрямую связанно с конкурентоспособностью подготовленных кадров
	Образовательные учреждения	Занять собственную нишу на рынке образовательных услуг, ориентируясь на отдельные сектора рынка труда, подготавливать конкурентоспособных специалистов, выполняя

		тем самым заказ государства, общества, работодателей и самих обучающихся
	Институциональные структуры государства	Максимально обеспечивать текущую и перспективную сбалансированность между рынком образовательных услуг и рынком рабочей силы в подготовке квалифицированных кадров
	Рынок образовательных услуг	Обеспечивать постоянно возобновляющиеся потребности выпускников школ в получении профессионального образования, максимально возможно приблизив профиль их подготовки к потребностям рынка труда

Добиться полного соответствия между интересами потребителей и возможностью самой системы профессионального образования довольно трудно. Адекватную взаимосвязь между государством, обществом, работодателями и системой профессионального образования можно осуществить на наш взгляд, на основе следующих подходов:

- Система профессионально образования обеспечивает потребности рынка труда в рабочей силе, приспосабливаясь к нему структурно и по содержанию. Это значит, что направления профессиональной подготовки, учебные планы и программы, технологии обучения, образовательные стандарты, разрабатываются в полном соответствии с конкретными производственными требованиями и заказами работодателей;

- Система занятости в структуре рынка труда приспосабливается к системе профессионального образования, исходя из ее реальных и потенциальных возможностей в подготовке или переподготовке квалифицированных и конкурентоспособных кадров, при этом профессиональное образование рассматривается как относительно обособленная от социально-экономического комплекса образовательная структура.

Анализ этих подходов показывает, что ни один из них не используется в чистом виде на практике. Первый, по той причине, что рынок труда не в состоянии точно сформулировать и спрогнозировать количественные и качественные требования к специалистам, подготавливаемым в системе профессионального образования, особенно на длительный период времени. Представление о производственных структурах и характере предприятий, функционирующих в условиях развитого, социально ориентированного сообщества. Как мы знаем, экономику стран ЕС образуют малые (микро) и средние предприятия, которые требует работников со значительно отличающимися квалификационными характеристиками по сравнению с работниками крупных предприятий.

Дело в том, что одним из решающих факторов в современной международной конкуренции является гарантия высокого качества продукции. Для его достижения необходимо обеспечение контроля качества труда и продукции на каждом рабочем месте вместо контроля качества товара только на выходе. Такому производству не подходит “дешевая” узкоквалифицированная рабочая сила, используемая на монотонных рабочих местах с высокой степенью механизации или автоматизации.

Сегодня конкурентоспособность может стать решающим системообразующим фактором во внутринациональных и в международных отношениях. Такая постановка проблемы соответствует новому положению экономических систем, функционирующих в условиях неограниченных возможностей интенсивного развития, приводящего в свою очередь к постановке вопросов по расширению экономического пространства и связанному с этим перераспределению трудовых ресурсов. Их свободная миграция и воспроизводство в системе образования внутри страны, из страны в страну, а также объединенный рынок трудовых (человеческих) ресурсов и образовательных услуг становятся важнейшим условием достижений научно-технического и экономического прогресса страны. В связи с этим мы считаем, что профессиональное образование должно стать наиболее перспективным и рентабельным объектом целевых инвестиций на подготовку конкурентоспособных специалистов, а не бюджетных затрат на невостребованных полностью кадров.

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Pedagogical Conditions of Forming Professional Competence of Teachers Based on Innovative Approach

***Key words*:** Competence, cooperation, activities, communication, professional, interpersonal relationship, needs, interest, relationship, definition, objectives, innovation.

***Annotation*:** This article highlights the issues of development of professional competence of teachers, the necessity of cooperation and experience exchange between teachers, correlation of personal interest with the requests and needs of the state and society. The author considers the main means of the development of competence of the teacher (entry into communication, the establishment of friendly relations with the participants of the educational process, creation of an enabling environment), given the emphasis to the role of external factors on the development of professional competence of teachers.

The implementation of reforms to strengthen the independence of our country and the achievement of the set goals, further democratization of society, modernization and development of the country, creation of conditions to provide in the short term prosperous life

and creative work demanded a radical reform and upgrade the system of continuous education, the constant work of teachers on themselves and improve their knowledge, skills and qualifications. In this connection, the main task of the education system is determined to prepare highly qualified specialists, development of professional competence of a teacher through the introduction of innovative technologies in educational process, increase of innovation activity of the teacher, the formation and development of interest in innovation processes and skills of scientific research.

The exchange of information between teachers, effectiveness and efficiency of communication processes and relationships, on the one side, is connected with the novelty and reliability of information, on the other, with the formation and development of concepts and competence in a particular direction in establishing a link between teachers and information exchange basic matters is what kind occurs attitude (positive or negative), which in turn affects the development of professional competence. The principal objective of cooperation between teachers is that their relationships bring mutual benefit, so as each teacher is an inherent ability and activity (1). If the relationship does not work for the common good and timely coordinate, they can have a negative impact on the relationship of teachers, and then pedagogical competence is formed only on the basis of understanding and perception of the teacher. The main factor to ensure efficiency, some activities, is the setting for the human with goals, objectives to achieve, preliminary planning, the choice of the ways of implementation, the selection and the distribution between tasks, based on the content robots; coordination of participants of the organized process.

The purpose determines the necessity of the organization of the planned activity, that is, once defined goal, carried out certain actions and, therefore, the main motive of the organization of activity is the goal; at the same time, the goal of auxiliary means of organizing activities.

In order to determine how I achieve the intended results, it is necessary to know in advance what way may be obstacles (difficulties) and how to overcome them, and to be clear, what for it is necessary to take any actions to meet personal or public needs, depends on the choice of means.

The needs, requests of the person associated with a specific life conditions. They can be both personal and social character. This is the first. **Secondly**. People use for their needs the techniques and tools that are specific historical and social environment. **Thirdly**. Most of the personal needs of people meet in a significant labor; social needs are replenished, or based on personal needs (2).

The needs of educators become a tool for development of their professional activity, the activity level in the actions and behavior. The work of teacher satisfaction of needs, effect on the common interest. Development of professional competence of a teacher has a significant influence on the appearance of his desires, aspirations related to improvement of its activity. Development of professional competence of the teacher is connected first of all with the stated goal, the study of certain concepts and ideas, analysis of existing theories and regulations. The

teacher can be formed several purposes, depending on that in what he does and what currently needs arise.

In the process of selection of ways and means to achieve their objectives and results, it is necessary to bear in mind the public interest. Defining the purpose and ways of its implementation, should focus on the establishment of relations with colleagues, sharing of resources and information. Such exchange contributes to the effective work of teachers.

We can assume that the development of professional competence of teachers of educational institutions is specific purpose in achieving high results. Teachers capable of perception and self-expression, we aim to achieve positive results in its activity that is the formation of self-esteem and self-government. As a means of development of professional competence of a teacher may make it needs to guide and issues related to the management of “power” and the subordination of trainees. However, management should not be perceived as attainment of power, but as an influence on others to solve their tasks, and thus, for teachers guide serves to establish the mutual influence (3).

For the development of professional competence determine the means are joining the communication, the establishment of friendly relations. It is necessary to take into account a number of external factors affecting the process of development of professional competence of teachers. One of the most important of these is the environment in which he lives and operates the teacher. In the educational process the teacher is in communication with all participants of this process, parents, representatives of public organizations, and on this basis is the self-development of teachers and therefore the development of professional competence.

On the nature of the teacher's activity is influenced by the requirements specified by the state and society to the educational system, internal regulations of the educational institution, modern requirements to knowledge and skills of the teacher, knowledge of innovative technologies; Ongoing reforms in the sphere of education in Uzbekistan. Modernization of the educational process and educational environment encourages teachers to seek answers and solutions to emerging issues, encourages them to use creative approaches, the result is the professional growth of the teacher, is formed personal interests associated with self-education and knowledge. Creative, professional development of teachers, in turn, has a beneficial effect on creating the atmosphere of an educational institution.

For development of professional competence of teachers it is also important the creation of innovative environment based on creative Commonwealth, as the possibility of joint solution of urgent problems.

When planning the activities of teachers are considered the most important questions of life, and determine the ways of their solving, effective means of achieving the goal. Important in this process becomes coordination of activities of the teaching staff.

Putting before itself a problem of development of professional competence and the choice of the ways of its implementation, every teacher relies primarily on their worldview, views and concepts, personal and public inquiries and interests.

While most manifest strong-willed qualities of the teacher. From the above we can conclude that the efficiency of the organization teacher of the educational process and control the process of acquiring knowledge, abilities and skills depends on the extent to which coordinated the activities of students and teachers, which created a learning environment in the school and what techniques and tools are formed motives and interests of the students to get knowledge. All these issues are directly related to professional competence of the teacher.

In order to organize the teaching process on a scientific basis, to manage it and create a favorable educational environment, the teacher needs to master modern methods of management, to know the priority of developing ideas, constantly examine the best practices and achievements in the development of science and technology, implementing them in teaching practice, to organize independent activity of students on the basis of enhancing their activity. The effectiveness of training highly qualified specialists at the level of modern requirements, the needs and interests of society, the state and the individual possessing the necessary knowledge, abilities and skills of high culture and competitive determined by the development of professional competence of teachers, their relationship in the process of pedagogical activity, motivation to self-improvement and self-education.

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Methodical Bases of Increasing Educational Activities in Legal Education of Students with Limited Vision

Key words: *purpose of education, the content of education, legal consciousness, legal culture, typhlopedagogics, special education, leadership qualities, educational activity, educational motivation.*

Annotation: *in this article, it is written the foundation of systematical of teaching judicial for the blind children. Pedagogical factors which have an influence for the judicial education are shown in scientifically. Technical methods which implement of judicial education are told too. I think this article helps positively to increase judicial amazement and culture of the blind children.*

В XXI веке человечество добилось немыслимых технологических достижении и открытий. Эти новшества времени требует от всех использования современных технологий во всех сферах жизни, в том числе и в системе воспитания молодого поколения. Всем известно, что личность получает основные фундаментальные знания в системе среднего образования, которое становится основой формирования навыков и умений подрастающего поколения. Говоря о правовом воспитании учеников с ограниченным зрением, мы хотим проанализировать этот процесс на основе педагогических взглядов современности.

Одной из целью оптимального подхода в учебно-воспитательной работе с этой категорией учащихся, является формирования в них высоко духовной личности. Главной задачей педагогического процесса является всестороннее содействие, становления и рост «лидерских» качеств учащихся с ограниченным зрением. В связи с этим педагогическим работникам необходимо решить следующие задачи:

1. Иметь достаточную информацию о каждом ученике класса.
2. Сведения о мотивационных особенностях учеников пассивной, средней и высокой активности в процессе учебы.
3. Определения, при содействии психологов дефектологов, у детей с ограниченным зрением, возможности других заболевании и определения направлении в будущей самостоятельной жизни.
4. Формирование у детей с ограниченным зрением лидерских качеств среди своих сверстников.

Всем нам известно, что правовые нормы формируют понятия соблюдения основных правил общества. Уважительное отношение к законам государства и общества у учащихся появится в том случае, если у них будет высокая степень правовой культуры. На вопрос кто и как должен повлиять на рост правового воспитания и культуры учеников

с ограниченным зрением необходимо найти рациональный ответ. В этом вопросе, как показывают исследовании, нами были выявлены ошибки, которые допускают педагогические работники.

Как видно на практике, педагоги, которые работают, в специализированных образовательных учреждениях не имеют глубоких знаний по дефектологии, тифлопедагогики и психологии. Ученики с ограниченным зрением основную информацию получают вербально, то есть через слух. Происходящие вокруг правовые действия и отношения ученики познают, через человека и эти понятие сохраняется в их восприятии и памяти. Правовое воспитание у такой категории учеников требует у педагогов знание наиболее удобной и эффективной методики преподавания и обучения. При объяснении правовых отношений, необходимо обратить внимание на каждый элемент, на каждую деталь в этой области, то есть подробное толкование этого понятия.

Учитывая специфику данного контингента, следует особо выделить те виды дисциплинарных, административных и уголовных правонарушений с учетом конкретных обстоятельств, которые происходят в реальной жизни, касательно каждого из них целесообразно было более широкое объяснение правовых аспектов трудовых и семейных отношений, которые будут необходимы в будущем.

Для развития правовой культура и имеющихся природных задатков у учеников с ограниченным зрением, в процессе обучения и воспитания, необходимо на наш взгляд использовать следующие методические приемы, которые могут быть эффективными:

1. Перед организацией и проведением занятий связанное с повышением правовой культуры необходимо иметь тифлопедагогические технические средства;
2. Применение воспитательных средств, которые удобны для восприятия и усвоения учениками с ограниченным зрением;
3. Объяснение и толкование различных правовых действий, на основе конкретных жизненных примеров и фактов;
4. Использование различных педагогических методов для развития скрытых способностей учащихся;
5. Широкое использование разнообразных учебно-методических приемов, направленных на развитие правового сознания и правовой культуры учеников.

Если будут поэтапно реализованы поставленные задачи, то можно достигнуть в этом направлении высоких результатов. Анализируя различную научную литературу по данной проблеме, выясняется такая проблема как стеснительность, робость, у учеников с ограниченнм зрением. На занятях по правовым знанием, при выражении своих мыслей и суждений у этой категории учеников часто проявляется двоякость и неуверенность в речи.
Эту психологическую неуверенность можно и необходимо исправить с использованием педагогических методов, что явилась бы решением нашей задачи. Формирование лидерских качеств у учеников этой категории, положительно влияет на воспитание и

обучения всего класса. Такие свойства как деловитесь, и прозорливость помогает ученикам в будущем найти свое достойное место в общественной и государственной жизни. На основе опыта наших экскрементов, мы убедились, что формирование лидерских качеств у учеников с ограниченным зрением помогло им найти свое место в жизни общества. Продемонстрируем деятельность учеников, у которых проявилась в процессе учебы, активность, и у качества, которые мы отнесли к категории пассивность.

Проявление лидерских качеств	Отсутствие или слабое проявление лидерства
Положительные качества	Отрицательные качества
Умение высказать свое мнение, точку зрения	Неуверенность, стеснительность
Умение трудится	Двойственность в выражении своих мыслей
Собственная мнение, самостоятельность в суждений	Опираться на помощь других
Управлять руководить коллективом	Не верие в свои способности

Большое влияние на рост правового сознания и правовой культуры оказывают задания и игры правовой тематикой. «По мнению некоторых ученых правоведов, на рост правового сознания молодежи, большой роль играет социальная среда, в которой живет ученик (семья, общество, внешнее окружение), что является важным фактором в воспитании».

Педагог – правовед, ученный О. Каримова говоря, о правовом воспитании и правовой грамотности молодежи определяет: «Высокая эффективность воспитания правовой культуры у молодежи, их активность всесторонне гармоничное развитие всецело зависит от учителей школ. Необходимо, чтобы педагог заложил в сознании ученика самые главные общечеловеческие и гуманистические ценности».

По нашему мнению, активность учащихся зависит от цели и содержания учебного процесса. Каждый педагог должен определить конкретно задачу своей педагогической и воспитательной деятельности. Правовое воспитание состоит из этих двух составных частей.

Выше сказанное, по нашему мнению, служит повышению качества и содержанию деятельности педагогов, их творческого потенциала и мастерства.

Делая вывод из вышесказанного, можно сделать заключение, что воспитание подрастающего поколения, гармонично развитой личности, является главной задачей педагогов: школа должна стать главной опорой для учащихся для подрастающего поколения, она является одним из факторов активности учащихся в учебном процессе.

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Professional Socializing Innovative System of Teachers

Key words: *system, formation, degree, pedagogical skill, acme logic approach, axiological approach.*

Annotation*: this article deals with professional socializing system on the basis of innovative approach, the developing degrees of pedagogical skills, the formation of future teachers' professional skills on the ground of systematic, acme logic and axiological approach. From the point of auto psychological competence, the component parts interpret teachers to be professional skills on the basis of creative capacities and axiological approach.*

Nowadays the requirements claimed to the formation of competent specialist of a person are becoming the main issue, especially, in the development of future teachers' professional skills. The future teachers are given great attention to the development training system of specialized activity in the Republic of Uzbekistan. Particularly, it is the issue to train future teachers in innovative activity and professional socializing. Unless a pedagogic personality forms self-organization and ready to the development it will not provide the total efficacy of pedagogic activity which face changes and enrich novelties. One of the main means of the development of future teachers' pedagogic skill is the efficient acquisition and implementation in practice arisen novelties in pedagogic activities.

As future teachers' professional socializing is a complex pedagogical phenomenon it requires a number of theoretical-methodological approaches. A principle concern focuses in the Republic to the system of development of future teachers' professional training activities. Particularly, it is the issue to train future teachers in innovative activity and professional socializing. Unless a pedagogic personality forms self-organization and ready to the development it will not provide the total efficacy of pedagogic activity which face changes and enrich novelties. One of the main means of the development of future teachers' pedagogic skill is the efficient acquisition and implementation in practice arisen novelties in pedagogic activities.

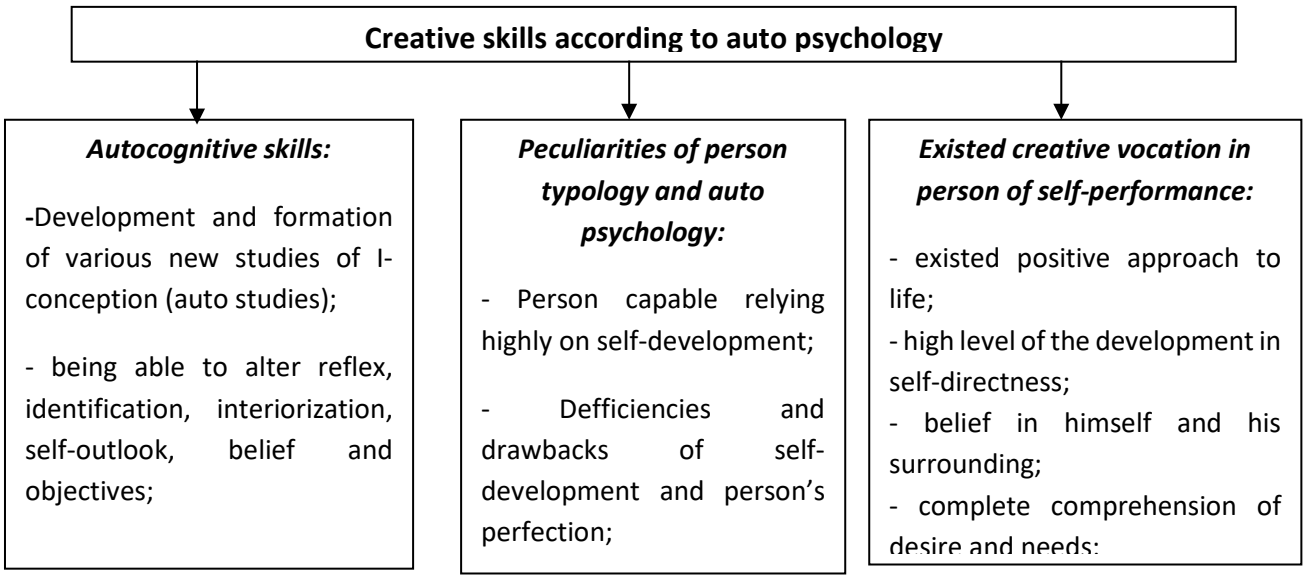
Significant role plays the reforms conducting in the system of higher education establishments in the development of teacher to be pedagogic skill. Constant changes of iinnovative technologies in the educational system have developed a new alteration in teachers to be views on their activity and professional pedagogical culture. At present the most important requirement for teachers to be are their activity, education and bringing up normative, perception of the tendency and methods, the formation of teachers' personality and effective introduction them in practice.

It is clear that modern pedagogics in methodology is thought to be an involuntary phenomenon and requires to comprehend as a separate compound units. Pedagogic skill claims to be one of the processes of systematic approach in pedagogic progress.

System (from Greek means complete, comprised from parts, joined) defines exact completeness, including units, correlated and other dependent components. System expresses the completeness of orderly placed and correlated parts of units (1).

Acmeologic approach (A.A. Derkach, S.N. Tolstov, N.B. Kovaleva, A.S. Oding, I.O. Sorokina, N.M. Egamberdiyeva) refers tearchers to be of professional socializing as participants in the scientific foundation of higher education, perfect personalities in professional activities, based on the presence of dynamic subjects, smoothing the way in the development their personalities and specialties step by step, continuous learning and self-development (2).

On the basis of acmeologic approach, the central part of teachers to be professional socializing model is considered to be effective creative skills reflecting creative component. Indeed, on the ground of acme logical approach, one of the main purposes of creative development is to develop innovative literacy of future pedagogics. In modern advanced period capabilities of innovative thinking is the main quality of future teachers. It includes the formation of creative thinking, creative study, and research capabilities in activity, eager to create novelty, to solve fairly professional creative assignments. Motivation to innovation, reasonable solution of pedagogical tasks, independent project design; The formation of intellectual situations that will enable them to solve their professional creative tasks. According to the auto psychological competence creative skills can be divided into following general classification (Picture 1):



Picture 1. The complex of creative skills according to auto psychology

Axiologic approach (V.A.Slastenin, G.I.CHijakov, O.Musurmonova, N.Ortiqov, SH.Mardonov, N.Egamberdieva, B.Xodjaev) is a constant characteristic of human pedagogics,

all human are believed as an objective of collective development and the high value of society. Therefore, axiology (philosophical values about medical values) is reckoned as a new philosophical education and conformable to the methodology of modern pedagogics.

One of the crucial features of axiological approach is that it enables teachers to be professional socialization reflecting pedagogical values.

Pedagogic values are such a peculiarity of pedagogical activity, they suppress not only pedagogical needs but also serves as a target to professional activity. Pedagogical values don't find proof themselves. They depend on social, political, economic relations in society.

It creates the system of professional directions on pedagogic values in teachers' to be conscious within its interpersonal communication, social activity, develop future officers' personalities; professional cooperation and interchanging enlighten dignities.

Two distinctive features of pedagogical values have been analyzed by scientists:

- The features enable teachers to suppress their financial and enlighten needs, serves as a sign directed to attain human objectives that have social significance, its social and professional dynamics;
- The conscious system which is the bond part and means of social outlook arising in sequencing norms in pedagogic activity, between both in education and pedagogics.

Diverse classifications of pedagogical values exist concerning with literature on pedagogical axiology. Notably, on the ground of professional trend system V.A.Slastenin classified pedagogical values as following:

1) objective values: personal conception of teachers to be private I and professional I. As long as a pedagogue is in search of realization of objectives in pedagogical activity she/he will choose her/his professional strategy on the way of self-development and others. That is why, objective values will be embodied in the development degree of state educational policy and pedagogical science. These values will turn into significant factors in the case of subjected and influence on indirect values. They form gaining the results of theory, methodology, pedagogical technologies which constitute the foundation of pedagogue's professional education. Important values for the personality include following objective values:

Creative and detailed characteristics of teacher's work, its prestige and significance, profound responsibility, self-performance, love for children etc. these values are reflected in person who gets knowledge and teach, the development of children's and pedagogical societies;

2) indirect values: pedagogic communication, technique and technology, monitoring, innovation, system of intuition. Indirect values serve as ameans to obtain objective values (recognition of work in public, the accordance of person's interest and skills to the classification of pedagogical activity, professional growth etc.);

3) communicative values: relations of the participants of pedagogical proccess, approach to professional-pedagogic activity;

4) quality values: person's behavior, various qualities to the activity.

5) values connected with cognition. Theoretically, the values connected with cognition of teaching profession, recognition and attaining values of teacher's profession by learners.

Social-pedagogic values include classification and notion of values of various social systems and revealing in social conscious. They are the complex of sequence of ideas, perceptions, norms, laws and traditions in the educational field of the activity of society.

Personal-pedagogical values appears as the education of social-psychologic values, which reflect oobjectives of teacher's personality, motives, ideas and other connected outlook peculiarities. This complex of features makes up its directed systems of values. Being the direction of values axeologic "I" comprises not only cognitive component parts (connected with studying), but also holds considerable role of human's internal directed sense-tolerant constituent. It takes both social-pedagogic and pedagogic values on the basis of professional-social values in individual-personal system.

In Uzbekistan, according to the features of educational values the educational values are divided into several groups:

1) Global conceptual educational values;
2) Exact educational values;
3) Individual-personal characteristic values in education;
4) Innovative pedagogic technologies, all mankind global-conceptual educational values;
5) The development as a person;
6) Democratic and humanitarian trends of education;
7) The formation of humanness and person's outlook.

For its turn, educational values have enlightening-ethics, classifies as both professional and social values, have trends such as common cultural, enlightening ethics, intellectual and creative directions.

According to the significant feature educational values are divided into following groups:

1) Conceptual-directed;
2) basis (resource), academic-objective;
3) personal values and professional-private;
4) theoretical-pedagogic;
5) theoretical-practical and processed-pedagogics, innovative-pedagogical technologies;
6) advanced information technologies;
7) in the process of education pay considerable attention in fostering in learners the qualities of enlightening-ethics characters;
8) Self-development.

As personal significant values of education the following values are recognized:

1) Formation of social-ideological, humaneness, aesthetic outlook;
2) Obtain high spiritual enlightenment;
3) Social-communicative activity, thorough development, common cultural, professional, intellectual, aesthetic, ecologic and others;
4) Self-mannered, development, improvement of personal, professional-vocational trends, formation of the concept «I».

Conceptual-directed values of education:

1) Person, his/her formation and thorough equitable development;
2) Have prolific outlook;
3) Humaneness the education, democratize, its national trend (its peculiar cultural-historical and enlightening-aesthetic traditions, national and humaneness ideas; science, technique, technology and culture, moreover achieves of national and world advanced pedagogics).

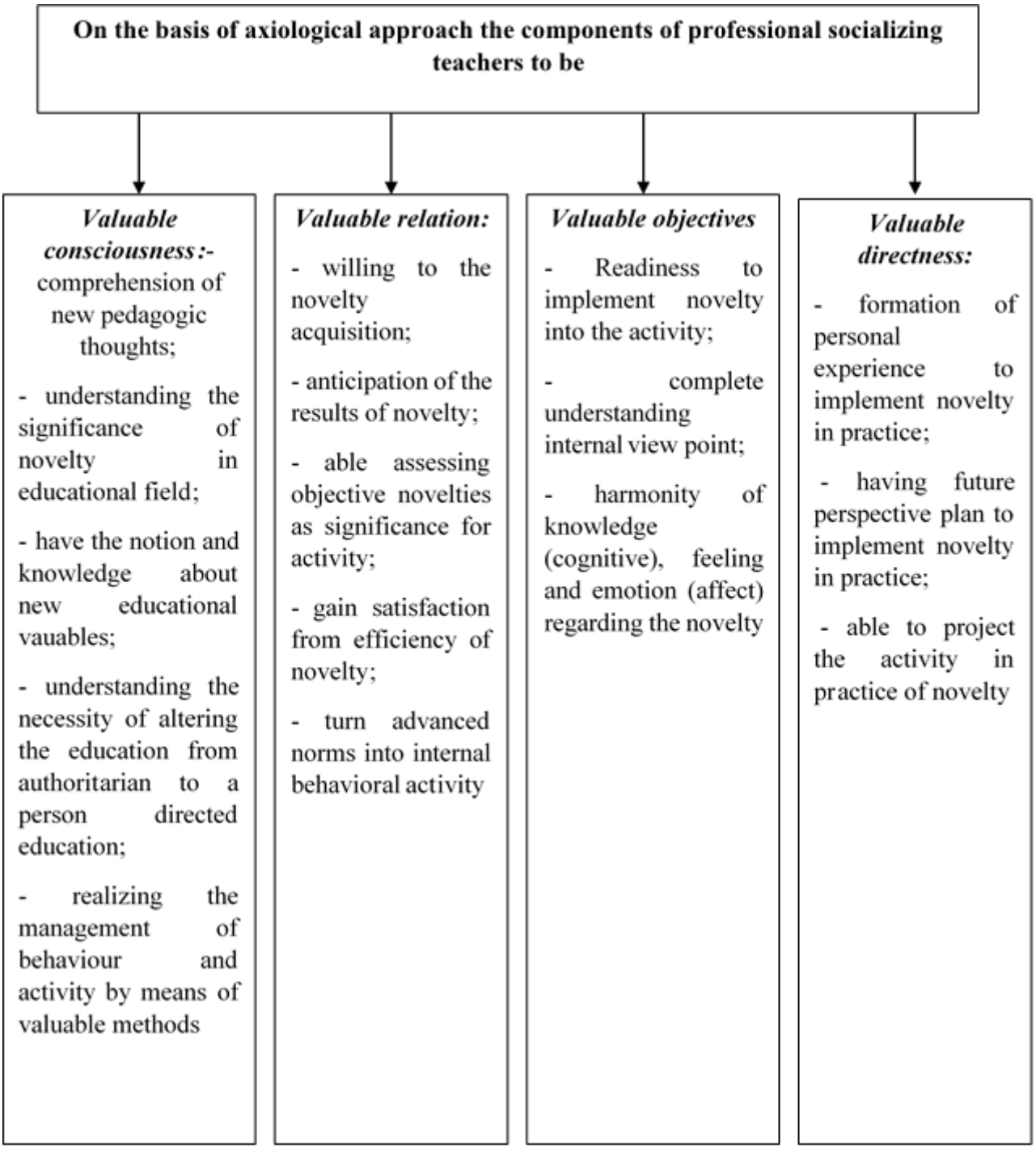
Basis (resource) values of education:

1) Modern methodology in education;
2) National and all human culture;
3) Pedagogic views of Eastern philosophers;
4) Ideas of people pedagogics;
5) National and world pedagogics;
6) Pedagogics directed to the person, psychology of pedagogical process.

Professional-persona values of education:

1) Social-personal degree – cause-value factor;
2) Emotional attitude to pedagogic activity (future, present);
3) Personal notion of professional-vocational education and instructions of social significance: interest and desire;
4) Pedagogic initiative, perceiving, responsibility, discipline;
5) Self-appraisal of pedagogue's personality, his/her recognition (considering an individual approach capability in academic and social activities);
6) individuality, having creativity inclination, personal interest, skill and vital requirements;
7) self-performance himself/herself in any activity, comprehending, activation of professional and personal activity, having chance to freethinking;
8) Using the concept "I" when self-acclaims.

In fact, regarding to the pedagogical profession it is an important factor of professional socializing to foster future teachers towards their pedagogical profession such as valuable consciousness, valuable relations, valuable objective and valuable direction. Starting from this basis, on the ground of axiological approach the following has been developed for teachers to be professional socializing system.



Picture 2. On the ground of axiological approach the professional socializing system for teachers to be.

It can be seen in Picture 2, valuable consciesnous endeavor teachers' to be in their sphere of professional activity to define subjects as objective phenomenon and comprehend advanced pedagogic thoughts, furthermore, understanding the significance of novelty in educational sphere will give opportunity to create new educational values in which they will have notion

and knowledge about them. Apparently, valuable consciesnous is significant for teachers to be in altering authoritarian education into a person directed education. While altering the education from authoritarian into a person directed one future teacher will form to manage behavior and activity by means of valuable methods.

In accord with axiologic approach teachers to be express professional socializing valuable relation which reflect interrelated components of personal and social significance. The followings features include teachers to be in professional socializing valuable relation: 1) desire to the acquisition of novelty; 2) anticipation of novelty result; 3) objective assessment significantly of novelty in the activity; 4) gain satisfaction from the novelty effect; 5) turn advanced norm into internal behavioral activity.

To acmeologic point of view, supporting concept carries out the tasks providing psychologics so as to classify mechanical – reflex in the creation process in the speed of innovative literacy, comprehension, resulting, specific features, besides creating novelty and implementing them into practice. N.G.Alekseyev and I.N.Semenov on the ground of analyzing practical activity suggested using paired layer (first layer – activity, second is meteo layer which forms its reflexive) practical-directed knowledge (3).

Innovative literacy in its turn has paired layer appearance: first has the same basis of intruding divertive novelties either little or much, the second depends on exact situation which has temporary layer. The main task of the first layer present teachers' to be creative work and self-development, the task of situation layer is the feature of innovative literacy in the future teachers activity, peculiarities of teacher's profession, conditions, that is positive approach to innovative changes of participants, depending on agreement of new condition within different types of groups.

According to I.O. Sorokinaning, the development in professional creativity reflects in various skills. Acmeologic skills the followings are important such as self-cognition, self -development and self-performance in the process of human's life activity. But their rapid development is the result of auto - psychological competence.

The followings constitute personal auto- psychological skills: 1) general – self-treatment, able to self-managing; 2) connected with cognition – the development of psychology and high level of quality of intellect; 3) cognitive – is expressed within interaction of acme logics cognition in self-understanding and professional activity; 4) creative – is expressed in the search of nonstandard solution of creative assignments, imagining and creating new figures; social-perspective – is expressed in self-appraisal in the matter of acme logics; connected with empathy – is yielding to emotional impacts; adaptation to emotional influence (4).

Taking into account the research of A.A.Derkach, S.P.Tolstov and N.M.Egamberdiyeva on the basis of acme logic approach teachers to be professional socializing system has been developed. In this research we will look through accordingly the components of the given model.

The model constitutes four interrelated components: 1) motivation-valuable; 2) cognitive; 3) activity; 4) creative.

The motivation-valuable component part of model comprises motivated and value. The component of motivation includes the following features:

1) Existence in harmonizing related cognition and professional motivation with stable internal needs;
2) Eagerness to productive activity;
3) Willing to dynamic participation in innovative process;
4) Self-performance needs.

Having been analyzed above scientific approach is considered as theoretical and methodological basis of teachers to be in professional socializing, uniting the process of systematics and completeness, directing objectively all subjects' strength and opportunities which gives each pedagogue work uniting his/her with individual and typological features. On the basis of systematic, acmelogic and axiologic approaches which we have worked out they will help future teachers to be prepared by means of professional socializing models successfully in pedagogical activity.

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Pedagogical System in Increasing Social Activity of Students

Key words: *Personality, development, social activity, educational process, knowledge, abilities, activity, educational activities, educational institutions, mahalla, family.*

Annotation:*. This article presents the research materials, which consider the psychological and pedagogical possibilities of increasing the social activity of the individual in the educational process. The article highlights the problems of increasing the effectiveness of the process of development of personal and social activity of young people.*

The building of a democratic civil society in Uzbekistan, the creation of conditions for a prosperous and happy life for young people, and hence the future state, is related to the extent to which the younger generation actively participates in the creative process.

Human needs are formed in the process of education, mastering cultural values. Satisfaction of a person's own needs occurs in the course of his activity, the content and forms of which are determined by the level of social development of society, that is, the activity of the individual is a controlled process. Therefore, the problem of the formation of social activity is investigated in pedagogical science.

A person understands public duties, duty to society and his responsibility as a natural state, and his freedom and social activity as a whole, which turns a person into a real person.

A person's vital activity is perceived as the leading component of his personality. In the process of formation of activity, not only natural and social factors, but personal desires and aspirations of a person are involved as well . Only in this way the personal and social appearance of a person develops. The very society, its essence and structure, components that organize relations in society - all these are the result of the creative activity of all individuals, creativity aimed at changing the world.

Changes in society occur endlessly, since they show the activity of the human person, there are new discoveries and development process. Changing the world, the active personality improves his abilities, skills, knowledge and skills, and therefore, changes and "creates himself." In the process of active life and work a person constantly expands his connections with society.

The criterion of social activity is usually considered an intensive activity. As a rule, three aspects of activity are evaluated: participation of the subject in various activities and high-level

readiness to achieve the goal; manifestation of personal qualities in activity; the social significance of the material or spiritual product obtained as a result of the activity.

Austrian psychologist and philosopher V.Frankl stressed that the individuality, personal values and essence of a person are necessarily connected with the society in which he lives.. According to the American sociologist T.Parkinson, the true value of the human personality is revealed only in relations with the environment, that is, manifested in its activity.

According to psychologists R.Plomin and H.Hermans 1997) three main factors influence the formation of full-fledged, fully developed personality (1, p.254):

1. The inherent biological capabilities: refers to the type of personality temperament that affects the relationships of people.
2. Subjective or psychological properties that determine the strategy of interpersonal relationships. They determine the possible choice for the entry of a person into certain relationships that are enriched and improved in the process of life.
3. Immediate interpersonal relations as an independent process function in the public cultural environment, which is the main mechanism that ensures the formation of personality

All three factors are in unity and interact. Without their continuity and interconnection, the comprehensive development of the personality is not possible.

The all-round development of the individual is not only the mastery of special knowledge, but also the ideological and moral formation of the personality; - this is not only a person - a worker, but also a representative of a certain social group and is known for his achievements and enjoying authority. A person who knows a lot in any area and owns certain skills , but who stands apart from social labor, public tasks, will not reach the level of a fully developed personality.

Therefore, when it comes to a fully developed personality, it means that a person is actively involved in the life of society, in public work, and is ready to perform various public tasks. Our experience confirms that to solve the problem of increasing the activity of the individual in the educational process, it is necessary to take into account the age and individual (psychological) characteristics of students. In this case, not only individual personality traits are taken into account, but from the very beginning of learning all personal traits of trainees are taken into account. Consequently, characterizing the activities of the individual, his psyche (mental state, mental characteristics, mental processes), we should also note the properties due to the national mentality.

As the pedagogical basis for the development of social activity of the individual in the learning process, the following statements are made:

- social activity of the person are formed in the process of social and pedagogical relations and is manifested in the life position of the trainees;
- An important indicator of the formation of intellectual and spiritual potential is the organized activity of the individual in accordance with public requirements;
- the development of social activity of the individual in the educational process is associated with the implementation of educational, organizational work at a high quality level;
- the development of social activity of the individual is stimulated by predicting the prospects for social progress.

We will designate three directions for the possible solution of the problems of the development of social activity of the individual in the educational process: bringing the concept of social activity to the consciousness of the individual; organization of meaningful leisure; orientation to the manifestation of any initiative on the part of the recipients of education and their support.

The results of the research convince us that if the appropriate pedagogical conditions are not created, the process of development of personal and social activity will prove ineffective. The reasons for this "failure" are as follows:

1) thoughts and opinions of students, life approaches, aspirations do not coincide with the world outlook of adults (parents, teachers, etc.);
2) mistakes and shortcomings committed by students are not analyzed, there is no assistance in their correction and elimination (in most cases the student's activity is strongly criticized);
3) conditions are not created for the free manifestation of initiative, independent thinking;
4) the authoritarian style of management of the educational process prevails in educational institutions;
5) healthy competition in the microenvironment is not encouraged, based on discussions, discussions, there is no opportunity to disclose the personal qualities and interests of students.

In our study, psychological and pedagogical opportunities were identified for increasing the social activity of the individual in the educational process, namely: humanization of public relations in enhancing the social activity of the individual; the use of interactive technologies in the learning process; taking into account the individual and age characteristics of the individual; providing pedagogical cooperation of educational institutions, neighborhood's and families.

The essence of the social environment of the individual, in our understanding, lies in: equal rights of the individual with other members of society, the ability to assess the situation; Creativity, the ability to plan their future, the desire to understand the meaning of life. If the following principles are formed in the individual, then his activity can be assessed as high. This: the willingness to perform scientific tasks, the desire for independent activity, the meaningfulness of the actions performed, the focus on the subject of activity, the desire to improve their knowledge (2).

The tasks of the training sessions listed below, their solution will greatly enhance the process of activating the individual: defending and arguing his point of view; Participation in discussions and discussions; Asking questions to classmates or a teacher; Evaluation and commenting on the answers of others; The explanation of the educational topics for poorly-achievable classmates, assistance in mastering the material; Assistance in mastering the material; Selection of tasks in accordance with their capabilities; Search for possible solutions to problems; Checking and analyzing the results of their work; Complex application of the acquired knowledge, skills and abilities to solve learning problems.

Leading educators, scientists of our Republic, teachers of secondary schools seeking to make maximum use of evidence-based and adapted to the socio-pedagogical conditions of Uzbekistan, modern educational technologies, including technologies aimed at strengthening identity in the educational process.

Denote the main criteria for increasing the level of social activity of students: mastering knowledge that enriches the worldview and contributes to the establishment of relations in society; participation in the process of organizing social relations; assimilation of the content of teaching public and humanitarian subjects and mastering the skills and skills of applying the acquired knowledge in practical activities; ability to find a way out of problem situations and evaluate them; manifestation of personality traits as a social activity level index card (consciousness, ideology, decisiveness, ability to work independence, initiative, strength, free thinking, creativity, responsibility, and so on.).

In conclusion, it should be emphasized that the social activity of an individual is associated with its participation in social relations and determines the content of these relations. For a man of his social activity is important in two aspects: - First, because of it creates the basis for determining a person's place in life, and secondly, all his knowledge, energy, capacity is realized in the labor market for the benefit of society. Social activity of the individual is formed in the educational process and is an indicator of the overall development of the individual. The developed content and criteria ensure the effectiveness of the process of development of social activity of the individual.

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Question of Using Linguo-cultural Material for Learning Native Tongue in Professional Colleges

Key words: *language picture of the world, language situation, sociality of language, linguo-cultural aspect, unity of language and culture, culture genesis subject, sphere of contact, theory of cross-cultural communication, dialogue of cultures, colour national and cultural specific, ino-culture, linguo-cultural comment.*

Annotation: *in the article the theoretical and practical questions of the use of linguo-cultural material are examined on employments of the mother tongue in the professional colleges of country.*

Республика Узбекистан является многонациональной страной, поэтому вопросы языка имеют особенно важное значение в процессе формирования нации.

Динамичность процесса распространения иностранных языков, в том числе и родного, эволюция языковой ситуации, в целом языковая картина мира предопределяют необходимость научных характеристик данного процесса и быстрого реагирования на определение статуса и значение тех или иных его факторов. На фоне языковой обстановки и сложившегося характера би- и поли-лингвизма в нашей стране рассматривается вопрос об общем положении контактируемых языков, об их взаимоотношении, где национальный язык (узбекский) является государственным. **Политиками, донорами** и специалистами в области образования обсуждаются **актуальные** проблемы, касающиеся как языковых ситуации в стране, так и изучения, и преподавания языков в контексте постоянно развивающегося мира и глобализацией, а также в связи с развитием высоких **информационных** технологий и процессов. Особый интерес представляет эволюционирующая проблема мотивации обучения языка: и межнационального, и международного общения. Знакомство с культурой страны изучаемого языка было одной из главных задач ещё со времен античности. Преподавание классических языков, трактовка **религиозных** текстов не мыслится без культуроведческого комментирования. В преподовании живых языков с конца 14 века на первое место наряду с устной речью выдвигается ознакомление с религии страны изучаемого языка. Особенно это было характерно для немецкой **лингвометодической** школы. В нашей стране различные сведения о том или ином государстве, преподаваемые в процессе обучения языку (связи с изучением языка), принят называть лингвострановедением, в Германии- культуроведением, в Американских учебных

заведениях имеются курсы языка и территорий, во Французской методической школе существует понятие «язык и цивилизация», английский колледж используют «теорию лингвокультурных исследований». Как известно, Аристотель, **Геракл**, Эфес, Платон и другие греческие и римские философы выводили значение слов за пределы языка. Обсуждение тезиса о социальности языка продолжается и по настоящее время. С.М. Верещагин отметил «диалектическое единстве языка и культуры, языка и общества». Это говорит о том, что движущей силой прогресса и преобразований в языке является в конечном счёте общество. Об этом говорил и Я.А. Коменский, который считал, что изучение языков (родного и иностранного) должно идти одновременно с усвоением мира вещей. «Овладение языком, по его мнению, - без обращения к внеязыковой действительности приводит к тому, что ученик или студент пользуется словами, не вкладывая в них адекватного смысла». В этом смысле, по нашему мнению, важно, чтобы изучающий язык мог понять и осознать значение каждого слова, вникать в содержание, вложенного в него народом. Тем самым он будет укреплять и расширять сферу действия языка (слова); другому народу, языком выражая своё отношение к которого он овладевает, как к уникальному культурному субъекту. Развитие современной культуры нашего государства основывается на «диалогичном» отношении к культурам прошлого и настоящего. В сферу контактирования вливается и европейская культура, и культуру стран Востока (Кант, Шиллер, аль Фараби, Мирзо Бедиль и др).

Для создания теории межкультурного общения (коммуникации) путём разнообразных экспериментальных исследований учёных (В.Г. Костомарова, Ю.Ю. Дешериевой, Е.М. Верещагина и др.) выделены следующие основные аспекты диалога культур.

1. Билингвистический аспект (проблемы интерференции, кодового переключения языкового дефицита и др.);
2. Прагматический аспект (анализ специфики коммуникативного взаимодействия представителей разных национальностей, выявление особенностей реализации интонаций участников диалога культур и т.д.);
3. Когнитивный аспект (исследование когнитивных особенностей, путей восприятия и понимания изучаемой культуры (языка) различными национальными контингентами учащихся: субъективная логика-индукция, дедукция и.т.п.);
4. Аксиологический аспект (выявление оценочных характеристик, приписываемых явлением изучаемой культуры (языка) носителями различных национальных культур);
5. Эстетический аспект (пути эстетического достижения изучаемой культуры языка) учащихся разных национальностей.

Именно поэтому без сведений о культуре страны изучаемого языка нельзя правильно понять взаимоотношение между языком и культурой представителями контактируемых народов. Феномен интереса к иностранному языку как к диалогу культур имеет непреходящее значение в качестве постоянно действующего фактора в распространении би-, три-, поли- лингвизма в стране.

Масштабность действия языка, его функционирования говорят о том, насколько это понятие объёмно и ёмко. Осмыслить, осознать семантику слова «язык» - значит, понять

современный дух времени, передать символический строй национальной речи, его колорит. Бесспорно, что современная языковая личность должна осознавать язык как национальный культурный феномен, как **общечеловеческую** ценность, и то в языке народа аккумулируется национальный опыт его жизни, его менталитет, его культура что является уникальным, **самобытным,** духовным, перспективным достоянием нации. Из сказанного следует, что стратегия обучения языку должна, на наш взгляд, строится с учётом национально – культурной **специфики** и включать различные коммуникативные модели и ситуации. В связи с **изложенным выше,** считаем, что на занятиях родного языка в профессиональных колледжах и вузах должна преобладать информация как страноведческого, так и краеведческого плана, преследующих цель обеспечить межкультурное общение и взаимопонимание между партнёрами. Из сказанного видно, насколько велика и обширна презентуемая проблематика. Она имеет комплексный характер. При изучении родного языка **учащийся** стремятся прежде всего овладеть ещё одним способом участия в коммуникации. Ясно, усваивая язык, он одновременно проникает в новую нереальную культуру, получает духовное богатство, хранимое **изучаемым** языком. Сказанное не ново, однако, аксиомой является то, что сами носители языка овладевают своей собственной национальной культурой не иначе как через посредство родного языка. Следовательно, новый язык выступает **«Своеобразным»** мостиком для приобщения ученика к инокультуре, где осуществляется диалог между родной и другой культурами.

Средством усиления положительной мотивации к изучению родного языка являются задание и упражнение лингвострановедческой и **лингвокраеведческой** направленности. Приведём отдельные примеры из наших экспериментальных материалов.

ХОРЕЗМ

Хорезм по праву считается одним из очагов мировой цивилизации. Это край такой же древний, как и «Авеста». Эта земля дала миру таких гениальных ученых и мыслителей, как Аль Хорезми, Абу Райхон Беруни, Джалолиддин Мангуберди, Нажмиддин Кубро, Махмуд Замахшари, Пахлавон Махмуд, Огахи…. Независимость страны открыла в истории страны новую страницу, время великих свершений. Президент республики уделяет большое внимание проблемам возрождения национального самосознания, знакомству мировой общественности с богатейшим наследием наших великих предков, вековых традиций, с особой любовью относится к культуре Хорезма, за минувшие годы на мировом уровне отмечались 2500-летие города Хивы, 2700-летие «Авеста». Особое почтение было оказано самоотверженному защитнику родной земли Джололиддину Мангуберди. Создание мемориальных комплексов Аль Хорезми, Абу Райхона Беруни также является проявлением глубокого уважения и данью памяти великим предкам.

Любовь и преданность жителей Хорезма к Родине, высоко во спеты великими поэтами этой земли – Ферузом и Огахи, Мунисом и Хорезми. Такие строки великого поэта и святого Пахлавона Махмуда, как – «Для меня в тысячу раз дороже кусок войлока Хорезма, чем атласы Рима » олицетворяют душу всех хорезмцев.

1. Лингвокраеведческий словарь:

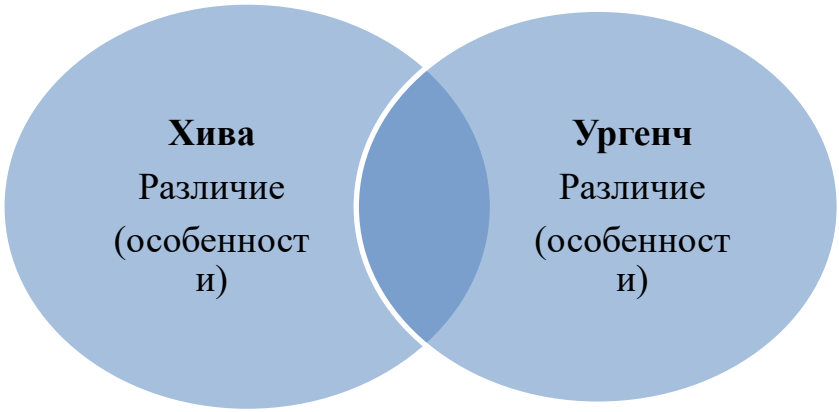
«Авеста» -древнеиранский религиозный памятник; в зороастризме собрание священных книг; «Авеста» возникла, видимо, в 1-й половине 1-го тысячелетия до нашей эры. Содержит свод религиозных и юридических предписаний, молитвенного песнопения.
Аль Хорезми – среднеазиатский ученый, автор основополагающих трактатов по арифметике и алгебре. Имеются труды по астрономии, географии и т.д.
Абу Райхон Беруни - ученый энциклопедист. Родился в Кяте -столице Хорезма. Труды по математике, астрономии, физики, истории. В возрасти 21 года первым на Востока создал макет земли глобус.
Джалолиддин Мангуберди – султан хорезмского государства, практик и теоретик военного дела, великий полководец.
Огахи Мухаммад Риза - видный представитель узбекской литературы XIX века. Учёный, талантливый поэт, историк, переводчик. Родился в кишлаке Кият близ Хивы . Автор пяти самостоятельных произведений, об истории Хорезма.
Хива основана на рубеже нашей эры в конце VI века – 1920 года, столица Хивинского ханства.
Палван – богатырь, борец, силач.
Кураш - национальный спортивный вид борьбы.
Феруз - великий поэт Хорезмской земли.
Мунис - известный поэт Хорезма.

2. Прокомментируйте следующие слова:

Цивилизация, самбо, предки, дзюдо, церемония, чудо, колыбель, войлок

используйте при выполнении данного задания толковые словари, в частности, словарь родного языка С.И. Ожегова.

3. Заполните диаграмму Венна:
Хорезм



При выполнении этого задания обратите внимание на то , что в место соединения кругов записывается общее в двух понятиях,а в несоединенных местах круга записывается их различие (особенности).

Например: в общее – древние города Хива и Ургенч; в различие Хива – один из городов Хорезма, Ургенч столица Хорезма.

4. Дополните текст «Хорезм» историческими сведениями. Почему его называют «очагом мировой цивилизации»?

5. Закончите монолог:

Джалолиддин Мангуберди самотверженный защитник хорезмской земли.Став султаном хорезмского государства, взялся за оборону своей страны.Железные требования, царившие в армии Мангуберди, послужили основой побед великого полководца.

6. Творческое задание: Используя материалы, интернет, напишите статью в стенгазету на тему «Авеста».

7. Перечислите гениальных ученых и мыслителей Хорезма. Напишите их краткую биографию.

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Importance of Language Skills Integration in Project Work to Improve Students' Communicative Competence

Key words: *technology, approaches, communication, competence, project work, principles, realization, integration, analyze.*

Annotation: *The article analyses the advantages of project work in language learning students. The importance of project work in teaching foreign languages and developing communicative competence is accessed scientifically in teaching foreign languages. The author of the article explains the principles and main stages of project work and the implementation of project work in educational process.*

At present days a great attention is given to language teaching and learning in Uzbekistan. The use of innovative, information and pedagogical technologies in the class has become quite an urgent process in teaching and learning. Therefore, using different activities can be integrated into the process of learning any foreign languages becomes one of the vital way in teaching process.

It's certainly true that success of teaching language mostly depends on the method and technique that teacher uses during the lesson. Different types of project work help teachers to accelerate their classes. Project work in the classroom has become common nowadays but they are not new idea and approaches to learning. Project work helps language learners to enrich the knowledge and develop their communicative competence. First of all, we must identify what is the project work itself.

According to Longman dictionary of language teaching and applied linguistics project work is (in teaching) an activity which centers around the completion of a task and which usually requires an extended amount of independent work either by an individual student or by a group of student .

Macmillan Essential dictionary for learners of English defines "project" is: 1. An organized attempt to achieve something, 2. A piece of work that involves collecting information (1, p.571).

We consider that project work is a cooperative work which is done by learners' to achieve a good product in learning process. Much of this work takes place outside the classroom. Project work often involves three stages:

1. Classroom planning. The students and teacher discuss the content and scope of the project and their needs.
2. Carrying out the project. The students move out of the classroom to complete their planned tasks. (eg. Conducting interviews, collecting information)

3. Reviewing and monitoring. This includes discussions and feedback sessions by the teacher and participants, both during and after the project.

In language teaching, project work is thought to be an activity which promotes co-operative learning, reflects the principles of student-centred teaching promotes language learning through using the language for authentic communicative purposes (2, p. 296).

Kratochvílová suggests four main stages of the project:
1. Planning
2. Realization
3. Presentation of an output
4. Evaluation (3, p. 41-42).

From our point of view, it has planning (starting), implementing (main part), end product (closure). It consists of input then output process.

As Fried-Booth (1986) says that "by encouraging students to move out of the classroom and into the world, project work helps to bridge the gap between language study and language use." She continues that "it is, therefore, a valuable means of extending the communicative skills acquired in the classroom." (4, p. 7)

We totally agree above the ideas and can say that project work helps to bridge the gap between language study and it's use. In addition, it provides a useful way of integrating the four skills: Reading, Writing, Listening and Speaking. However, four skills are used simultaneously. In Reading (journals, newspapers, brochures, materials, internet resources); In Writing (paragraphs, free writing, list of names, script, taking notes); In Listening and Speaking (dialogue, monologue, interview, presentation, discussion, debates).

As Diana L Fried-Booth suggests long or short the project may be, it will pass through certain stages of development. These are: Stimulus, Definition of the project objective, Practice of language skills, Design of written materials, Group activities, Collecting information, Organization of materials and final presentation. (5, p. 9)

First of all, students should understand why they are going to do a project and how it is useful and benefits in learning. They usually work in groups and it develops their social skills to cooperate. All project work should be learner-centered not teacher-centered. Teacher only has a role to direct students to make a project effectively. According to my experience I can identify the main points of teachers' and students' role in the project work.

The role of teachers' in the project work:
-to manage the time;
-to be facilitator;
-to control the process of project;
-to give advice;
-to direct and give ideas;
-to assess the project;
-to give feedback;

The role of students' in the project work:
-to work cooperatively;
- to share ideas within their group;
-to create friendly atmosphere;
- to find information and select;
-to analyze information;
-to take interview, photo, video for project work;
-to do research;
-to make a presentation;

Students are responsible for their project work and its results. All students should work in corporation and help each other in and out of class. Actually, the process is important than product because students have to be more active in order to achieve a good product. (motto: We all swim and sink together). At the end of the project work students present the result of their project work and make presentation. It helps language learners improving their communicative competence. After that they should write their reflective writing on their project work. So it gives them an opportunity to develop writing competence. The teacher evaluates not only the project work but at the same time the work of each student's contribution to the project work.

Project work is a creative work which demands integrated approach among the language skills. In project work the following language skills are integrated:

In Reading-students read different types of materials (paper based, computer based) and select it.

In Writing-students take notes, write necessary information, paragraph and write their reflective writing

Listening- students listen audio materials, watch videos, take interviews, share ideas and listen to each other.

Speaking- students discuss, share ideas, make decision, solve problems and make presentation.

As a result, different communicative competences are improved: such as intercultural competence, linguistic competence, discourse competence and social competence.

I have been working as an English teacher at the Uzbek State World Languages University for ten years. I have taught Integrated Skill subject for the first and second year students. I often use various projects to enrich teaching English. It is used across the curriculum.

I –courses project works' topics and suggestions.

№	Suggested topics	Name of projects	Explanation	Skills developed
1.	People and personality (horoscopes, famous people, stereotypes, talents, in born talents.	1.Our book of famous people.	Students collect information from magazines articles,	Independent skills, research skills, presentation skills,

			encyclopedias, internet and analyze in order to create a book of famous people.	decision making skills are improved.
2.	National identities of Uzbekistan and English speaking countries (National symbols, costumes, traditions, sightseeing, holiday, language, political systems)	2.Poster presentation about National symbols or system of government of Great Britain	Students learn national symbols of Uzbekistan and Great Britain (find info-mation, watch a video)	Research skills, IT skills, problem solving skills are developed.
3.	Food.(Healthy food, Keeping diet, Eating places)	3.Recipe book (Cookery book).	Students should create their favorite foods or different foods' recipe.	IT skills, research skills, critical thinking skills, creative skills, problem solving skiils are developed.
4.	Health; Healthy lifestyles, Smoking, traditional modern medicine, Opportunities for disabled people, Illnesses and human body.	4.Video project on "Healthy lifestyle"	Students should prepare video program on Healthy lifestyle"	Language skills, IT skills, research skills, presentation skills, decision making skills, leadership skills, time management skills.
5.	Family values: Family tree, Upbringing children, Marriage, Divorce, Multinational families, Household, Family celebration.	5. Role play on family values.	Students should act role play about family issues.	Creating skills, communicative skills, decision making skills.
6.	Education. School life, Student life comparison of educational school, Gap year, Exchange students, Studying abroad, Adult learning.	6. "My ideal school".	Students should make a layout of their ideal school.	IT skills, language skills, problem solving skills, autonomy skills.
7.	Cities and country life. Hometowns problems of big cities, Best place to live, Migration from countries to cities. Famous cities in the world.	7.City or country life.	Students should make a layout of city or country life.	Problem solving, communicative skills, leadership skills, language skills.
8.	Leisure and sport; Sports events, Hobbies, Show business, Music.	8.Poster presentation about sport games.	Students should make a poster about sport.	Creative skills, problem solving, IT skills, research skills, presentation skills.

9.	Technology and communication, Mobile phones, Sms, Internet, Chat room.	9.Video presentation on technology.	Students should take video about technology (computer, mobile phone, TV and etc) and it's importance.	IT skills, presentation skills, creative skills, language skills, leadership skills.

All in all, teaching all language skills are very sophisticated things to integrate. Moreover, it gives an opportunity to practice and develop students' spoken and written skills. Project work is one of the effective work which helps students to encourage learning the language with fun and without any affords. If teachers provide such classes with integration of language skills and organize different project works, without doubt I can say that they achieve good results in teaching and learning foreign languages sphere.

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Universal Categories in Language System

Key words: *language system, universal categories, logical-mental categories, Sapir-Whorf hypothesis, syntactic structure.*

Annotation*: the article deals with the problem of universal categories in language, their embodiment from the field of logic and thinking into the scope of specific linguistic concepts, which allows us to find their expression in semantic and syntactic structures.*

Changes in the socio-political situation in the world at the end of the 20th and beginning of the 21st centuries, the further development of the high-tech industry, and the expansion of the range of international contacts led to a revival of interest in linguistics and related sciences. The need for intercultural communication served as an incentive for deeper scientific research of language and thinking, as a means of forming speech, as well as developments in the field of comparative linguistics.

The most significant study in this area was the Sapir-Whorf hypothesis, also known as the hypothesis of linguistic relativity, which suggests that people who speak different languages think differently, and this is due to differences in their languages. If the Sapir-Whorf hypothesis is true, it means that people of different cultures think differently, and the reasons for this lie in the very nature, structure and functioning of their languages. Their thought processes, their associations, their ways of interpreting the world - even their perception of the same events - may be different because they speak a different language, and this language contributes to the formation of their thinking structure. This hypothesis also suggests that people who speak more than one language can in fact be guided by different structures of thinking when they speak different languages.

However, both linguists and psychologists distinguish some universal components in the system of language.

It is generally believed that the system of language in general is a system of four to five levels, formed by units of language. Phonemes are the smallest and most basic units of sound in a language, and morphemes are the smallest and most basic units of meaning. Phonemes, thus, form the basis of the hierarchy of language, in this framework the language becomes more complicated as the sounds acquire meaning, which in turn produces words, the words are linked into phrases and, finally, to sentences.

In addition, linguists describe the language using the following five main characteristics, which apparently apply to all languages of all cultures.

1. Phonetics is a system of rules governing how words should sound (pronounced) in a given language. For example, in English, the word new is pronounced "new", and the word sew as "co."

2. A vocabulary or vocabulary of a language is words that are in the language. For example, the words tree, drink, like slowly - are parts of the vocabulary of the language.

3. The syntax and grammar of a language is a system of rules that determines how words are formed and how words are linked together, making meaningful phrases. For example, in English there is a grammatical rule that requires that we add "s" to the nouns at the end, if we want to show the plural. One of the syntactic rules is that the adjective is usually placed in front of the noun, and not after (for example, a small dog, and not a small dog).

4. Semantics are the meanings of words. For example, the word table means a physical object with four legs and a flat horizontal cover.

5. Pragmatics is a system of rules that govern how language is used and understood in a given social context. For example, the statement "Something has become cold" can be interpreted as a request to close a window or as a statement of a fact relating to air temperature. How it will be interpreted may depend on the social and physical context.

Among psychologists and psycholinguists, it is generally recognized that the logical-mental categories are universal. Logical and thought categories in this case are defined as a kind of extralinguistic relation equally understood by the speakers of any language. Different languages use their specific means to explicate the same logical-mental relations. However, researchers, describing certain language tools and conducting comparative analogies, do not pay enough attention to the historical process of language development, which causes theoretical disunity and randomness of the practical application of scientific findings. Thus, there is a contradiction between the universality of logical-thinking categories and the availability of a different set of linguistic means of expression in different languages. Each language in the process of historical development forms its own unique set of means of expressing a particular cogitative category, which in linguistics is defined as a functional semantic field or category. A functional-semantic field or category (FSF, FSC) is the aggregate of all linguistic means for expressing certain relations in extralinguistic reality. However, the theory of FSC belongs to the field of fundamental linguistic research and does not find proper application in the practice of studying and teaching languages.

Thus, the language system at all levels except for phonemes intersects with the system of logical-mental categories or LMC, which makes it necessary to study the general language mechanisms of adaptation of logical-mental categories in detail.

When considering these issues in the study of the system of a language, researchers face contradictions. In this paper, we will give an example of such a contradiction in the expression of causation relations in complex syntactic constructions containing allied complexes and causative factors belonging to LMC on the material of the French language.

Causation as a functional-semantic category is a reflection in the system of the language of causation. Causation as a principle of extralinguistic relations is expressed in the fact that each phenomenon has a cause and, at the same time, causes another phenomenon. Cause and effect form a chain. The concept of causality generalizes the experience that a "consequence" takes place if and only if there was something else in the past, or in the present, "cause". It's not about the mental, but about an objective connection. The reason is a certain change, disintegrating in its meaning to external circumstances, internal conditions and excitement - the immediate cause. Analysis of the causative construct (CC) is conducted from the reference level to the lexical-grammatical, so the CC is defined as any construct expressing the causative situation (CS). A causative situation is a macro situational situation that consists of two micro-situations that are related to each other by the relations of causation, or causation.

Thus, a four-component syntactic structure is created, where to each constant, except for K, there corresponds a separate word.

The four-component model has a meaningful explication function for all the components of the semantic structure of the causative construct, and is also a formal means of syntactic derivation. Within the framework of this model, the relevant subject and state are related by predicative relations, which implies that we have a model of a complex sentence consisting of two simple, relationship-bound submissions.

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Karakalpak National Musical Heritage Role in Process of Developing National Consciousness and Intellection of Young Learners

Key words: *developing the effectiveness of teaching students at musical schools, lifelong education, reforms in educational system, teaching methods, education oriented on personality, folk-song.*

Annotation: *This article deals with the issues of developing the process of musical education in the Republic of Karakalpakstan, also shares with the major problems of education and science, and with some information about the usage of Karakalpak folk-songs in the process of formation the national consciousness and intellection of young learners. There are materials which may interest specialists of the sphere of music in this article.*

Во всех сферах нашего общества идет процесс реформирования. В системе этих реформ духовность, культура и искусство имеют важную составляющую. В частности, этап развития проходит ныне сложный процесс, как с исторической, так и с современной точки зрения. Эти процессы проявляются также при анализе изменений, происходящих в сознании людей. Так, музыкальное искусство настолько насыщен в жизни людей, что без него трудно представить процесс формирования полноценной личности и развития общества.

Многие песни и музыкальные произведения, описывающие жизнь и мысли людей дошли до наших дней через века и в каждом из них есть волнующая каждого через свой ритм сила влияния на людей, поневоле принуждающей их погружаться в глубокие мысли. Величественное значение музыкального искусства в жизни людей и общества неоднократно подчеркивались великими мыслителями прошлых веков. «Ё алҳазар, эй мусиқа олами, яхшиямки сен борсанг, гар сен бўлмаганингда инсоннинг аҳволи не кечар эди!» («Эй музыкальная жизнь, хорошо что ты есть на свете, не могу представить жизни людей без тебя!») -писал Фараби (1).

Правильный подход к культурному наследию, вопросы его использования, многие годы остались без внимания: оно не изучалась как научный предмет. После достижения нашей Республикой своей независимости начало уделяться должное внимание к этому вопросу: разработаны программы, изданы учебные и методические пособия.

Музыкальное искусство является основной частью культуры, поэтому на уроках в качестве главного критерия целесообразно выбрать тему «Музыка и жизнь», так как, человеческую жизнь трудно представить без музыки и песен, которые сопровождают нас повсюду, вдохновляет к труду и любви, являются частью нашей духовной жизни. Темы года для каждого класса «Мы любим и изучаем музыку» (1 класс), «Три мира музыки:

песня, танец и марш» (2 класс) и другие, четко показывают задачи, предстоящие перед учащимися. Для решения этих задач необходимо обучить каждого учащегося мастерству исполнения музыкального наследия, пониманию истории и содержания песни. Важно при этом, обучить учащегося правильному пользованию необходимой литературой (нот, методических руководств, учебных пособий, магнитных записей и др.).

Учитывая, что через силу влияния музыкального искусства можно пробудить у учащейся-молодежи стремление к красоте, доброте, человечности необходимо выбрать музыкальный дух школьной жизни. Необходимо выбрать музыку и песен, популярных среди детей, добиться желания у них многократного прослушивания и чтобы каждый раз они имели все новых и новых впечатлений.

Обучение детей наряду с музыкой и песен для детей, также фольклорных песен, разнообразной каракалпакской народной инструментальной музыки, классических песен каракалпакского народа вызвало любовь и стремление у учащихся к культурному наследию народа и стало причиной его внедрения в среднюю школу (2).

Педагогическая наука – как социально-гуманитарная дисциплина, тесно связана с периодом развития и, с точки зрения времени всегда меняется и совершенствуется. Ее нельзя рассматривать в отдельности от социальной жизни, так как, это противоречит принципам тесной взаимосвязи педагогической науки с жизнью, поэтому педагогическая наука обогащается новостями периода независимости, совершествуется и интегрируется с другими дисциплинами.

В Каракалпакстане имеются актуальные проблемы в системе образования и реформ в ней, являющимися одним из факторов для осуществления идеи создания независимого государства с большим будущим. Они требуют решения с учетом национальной самобытности и менталитета каракалпакского народа (3).

Сегодня уделяется большое внимание на дальнейшее совершествование системы народного образования, организацию методов и средств процесса обучения и воспитания по новому. Когда слушаешь песню или музыку, чувствуется отзвуки прошлого. В формировании у ущащейся-молодежи национального сознания и мышления, необходимо обучение на основе исполнения бахши каракалпакской народной музыки и эпосов, теоретическим и практическим основам решения проблем мастерства исполнения каракалпакских народных эпосов, передать им искусства бахши с возможностями эстетического воспитания в духе патриотизма, с системой методов, с принципами, формами, средствами, методическими подходами. Все это не оставит слушателя равнодушным.

Мастерское исполнение каракалпакских национальных песен, оказать влияние на сердце слушателя – большое искусство, а умение слушать и наслаждаться этой музыкой – это талант, поэтому привить учащимся навыков умения слушать старых мастеров музыкального искусства – наставников, выработать почтенного отношения к ним, являются ответственными задачами, предстоящими перед педагогами. Мастерство

наставника-педагога не в принуждении ученика, а в поощрении его стремления и желания освоения мастерства исполнения.

Исходя из вышеизложенного необходимо отметить, что ряды старого поколения мастеров искусств все редеет, поэтому необходимо торопиться научиться у них секреты мастерства, чтобы продолжить их дела, для чего необходимо соблюдать нижеследующие критерии.

Во первых- учитывая, что сегодня качество музыкальных передач телевидения и радио высокое, необходимо эффективно их использовать на уроках.

Во вторых- для вовлечения учащейся-молодежи к творческой деятельности необходимо систематически проводить конкурсы с учетом их возрастных особенностей, обучить их сценическому мастерству.

В третьих- организовать встречи с видными деятелями музыкального искусства – музыкантами, певцами, наиболее полно использовать их произведений.

В четвертых-организовать экскурсии в музеи искусств, театры, анализировать достижения и недостатки театрального искусства.

Во пятых- вести уроки музыки в школах в неразрывной связи с внеклассной работой, обеспечить активного участия в них учащихся музыкальных школ.

В шестых- широко использовать произведения восточных мыслителей, посвященные музыке и музыкальному воспитанию.

Использование музыкального наследия в формировании духовно развитой личности, в воспитании у учащейся молодежи чувств патриотизма, гуманизма имеет большое значение.

Воспитание всесторонне развитого молодого поколения, дать им знания на основе требований сегодняшнего дня, подготовить кадров для независимого Узбекистана – забота о будущем. В последнее время часто говорят о понижении сочувствия и милосердия среди людей, идет поиск причин этого и принимаются меры. Например, в последние годы среди молодежи наблюдается повышение интереса к зарубежной музыке и понижение интереса к истинным жемчужинам искусства нашего народа. Но, сегодня благодаря независимости, мастерское исполнение каракалпакских национальных песен, оказать влияние на сердце слушателя стало искусством, а умение слушать и наслаждаться этой музыкой считается талантом, поэтому привить учащимся навыков умения слушать старых мастеров музыкального искусства – наставников, выработать у учащихся почтенного отношения к ним, являются ответственными задачами, предстоящими перед педагогами.

Нами планируется в будущем написание статей о творчествах каракалпакских народных бахши и музыкантов, таких как Каражан бахши Кабулов, Тилеумурат, Тыныбай, Есжан

бахши Косполатов, Отен бахши Торешов, Айтжан Хожалепесов, Жапак Шамуратов, Амет бахши Тарийхов, Гайбулла бахши, Ибрайим Патуллаев, Генжебай Тилеумуратов, Пирнияз Отегенов, Ансатбай Гайратдинов, Салменбай Садыков, Каримбай Тыныбаев, Курбанбай Есжанов, Турганбай Курбанов, Гайрат Отемуратов, Тенел Каллиев, созданных ими школах, в статьях будут представлены образцы их лучших художественных произведений.

Нами установлено, что уместное использование мысли народа о воспитании и обучении в неразрывной связи с музыкальным искусством с учетом менталитета, социальной жизни и самобытности каракалпакского народа в процессе непрерывного образования периода независимости является эффективным.

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