

Technology of Organization of Students' Independent Work

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Abstract: The researchers are conducted for an intensification of educational process in higher educational institution where it is necessary to essentially develop new approaches, forms and the methods of social and pedagogical interaction appropriate to new requirements, new pedagogical thinking. We can choose the methods of social and psychological training (SPT) among them which received their development in experimental psychology by synthesis of wide practical experience of educational, creative, administrative and other types of interrelation between people. These methods conditionally divide to: debatable (group discussion, analysis of a situation of a moral choice), game methods (didactic, creative, role-playing games), sensitive training (training of interpersonal sensitivity) which forms an independent informative activity of students on the basis of modern technologies as the mechanism of improvement of independent work. Researchers are expressed in search and finding effective forms and means of activization of educational and informative process of preparation of young teachers of vocational training, theoretically and practically prepared in the field of the independent informative activity, using the modern technology of training and its further realization in work with students of technical secondary [1]. They offer the model of organization and application of the complex of these methods in contents and complex of training programs of systems of tasks in educational process as one of ways of formation of social and psychological culture of future teacher.

Key words: Innovative training • Complex of training programs of system-tasks • Independent choice of a way • Diagnostic stage

INTRODUCTION

We consider management of students' independent work as a bilateral process, where controlling functions are fulfilled by a teacher and students themselves and this process is executed by stages. Elaboration of the issues of students' independent work management is related to application of various handouts as materialized system of activities of the students: creation of a system and gradually complicated tasks: from imitative-reproductive to creative. This ensures the development of educational independence and is a condition of individualization of education. In this framework the problem of formation of independent individual is a problem of transition from external management to internal, to self-management.

Actuality: The analysis of students' educational activity in three levels of education process, the unit of which is an educational problem – considering it from the perspective of technical education, we came to the conclusion that pedagogical structuring of “minimum organization unit” requires the consideration of three basic concepts which will be the basis for further structuring:

- The process of education, as a model of individual-oriented education, must be built on the following pedagogic relation:

EA→TA→AE

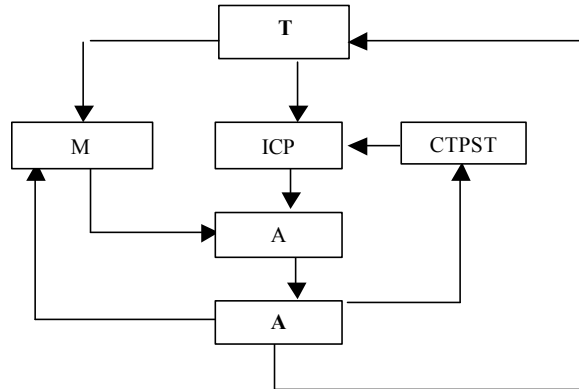


Image 1: The educational situation of independent choice of task solution

In the diagram: T – educational task; M – teacher’s didactic method; A – student’s educational activity; A – the analysis of student’s educational activity; CTPST – complex of teaching programs of system tasks; ICP – independent choice of the path.

(Educational activity – teaching activity - aims of education) [2].

- The essence of the second concept lies in “liberation” of student’s thinking activity, factoring into formation and development of student’s independence.
- As the innovational education is aimed at development of individual’s independent activity, it’s important to emphasize on professional orientation in education.

Due to this, we suggest considering the educational situation “independent choice of the path” of educational task solution as “minimum organization unit” (MOU) of independent educational activity. In diagram, this situation is demonstrated in the Image 1.

Among the general methods, principles, postulates, ways and strategies of dialogic interaction, which are important from the perspective of including them into the content of pedagogical methodology, we used the principle of dialogic vocalic harmony, method of homeostatic, compromise postulate, heuristic topic strategies, heuristic mystery, the methods of search and interpretation of association, interpretation of vague images, fresh perspective and others [3].

The usage of stated methods creates conditions of effective realization of such non-traditional forms of educational activity, widely used in foreign practice, as a discussion-lecture, conference-lecture, cross-curricular seminar, research seminar, collective group method of conduct of laboratory practical and others [4, 5].

The research demonstrates that one of the main tools of the teacher, which gives him the opportunity to help students in their independent educational activity, is an arsenal of educational aids.

We suggest using “Complex of teaching programs of system tasks”, consisting of the following components as such aids: planning of students’ independent educational activities; development and usage of training tasks; organization and conduct of controlling and corrective lessons [6, 7].

Thus, the program of actions that we developed includes the following components:

- Planning of independent educational activity (depending on general and private educational aims and from the availability of particular means, level of formedness of SIEA).
- Direct development of educational system tasks, corresponding to a definite level of student’s IEA and calling to improve the educational process in all spheres of educational activity.
- Organization of controlling and corrective system of lessons, aimed at involvement of appropriate tasks and abilities of students and also including a detailed analysis and further adaptation of institutional sides of educational activity with a view to increase its efficiency.

We consider the training tasks as a system consisting of three levels: low, middle, higher. Parting the tasks on levels is conditioned by uneven progress of the students and the levels of IEA. The main aim of each task

– formation and consolidation of arsenal of knowledge and abilities, factoring into “transition” of a student to higher intellectual level [6].

This type of lessons helps establish qualitatively new relations between a teacher and a student as there is no forced tempo of work. It's clear that the latter is defined by the student himself, who learns to allocate and save the time allotted for study of the topic in the process of independent work on training tasks. In other words, in the process of independent educational activity, the student chooses the shortest way of acquiring the necessary volume of educational material. This activity has a nature of active, purposeful independent work with training tasks (CTPST), with teachers' individual consultative help.

So-called individual classroom-based, individual home and semestrial tasks on the basic training materials serve for the stated aim. A definite variant (the number of variant depends on the results of diagnostics) of task is assigned for each student and also these tasks include questions on actualization of basic knowledge from vocational school program, the students repeat an appropriate material on these issues, as this knowledge is a necessary condition for acquisition of studied topics of the course. We conducted laboratory and practical tasks on the following plan:

Frontal written quiz on theory on one of the main questions of previous lecture, which will be developed on this practical lesson – 10-12 min.;

Solution of typical example tasks on a board with a directive help of teacher – 25-30 min.;

The efficiency of the organizational and methodic model of management and control of students' independent work were evaluated by us on change dynamics of accreditation marks (modular rating mark) in the course of semester on the results of control works and dynamics of knowledge quality in exams [8].

With a view to observe objectivity of the set experiment and to attain more exact data, a cross-check of experimental and control group work results were used in investigation.

The analysis demonstrates the tendency of growth of positive evaluations in experimental group, their percentage constantly increased as compared to control group in the frames of 10-18%. Thus, qualitative indicators in experimental group significantly overgrew the indicators of control group: the specific gravity of excellent and good marks – at an average to 20% and average mark – to 0,5.

Except testing, for an objective evaluation of effectiveness of level change of students' educational independence, we conducted an additional experiment in the form of organization and conduct of “pedagogical slices”, which consists of 6 stages. Diagnostic stage, improvement of knowledge, methods of forming students' educational independence, methods of developing students' educational independence in the course of academic year, improvement of student' activity [9]. “Pedagogical slices” data, reflected in dynamics demonstrated that the level of students' educational independence grows as compared to control with the advancement from stage to stage in experimental groups. At that by the sixth stage in experimental groups there were only excellent (majority) and good marks, which corresponded to high and transitional from average to high level of development of students' educational independence.

Control works, executed by students in midterm lessons, were evaluated by group of teachers (experts), which consists of group leader, who conducts a controlling lesson; and two or three specialists. The necessity of assigning a group of experts, but not one teacher is conditioned by the fact that each teacher has a subjective opinion in evaluation of control work results. Thus, the expert group of teachers will give more exact and objective results than one teacher.

The coefficient of acquisition of necessary volume of material is conditioned by [10, 11]:

For testing questions: $K1=(n1/N1) \cdot 100$; ($K1=4/5 \cdot 100=80\%$);

For tasks: $K2=(n2/N2) \cdot 100$; ($K2=(2/3) \cdot 100=66,7\%$);

For tasks: $K3=(n3/N3) \cdot 100$; ($K3=(1/1) \cdot 100=100\%$);

$n1$ – number of correct answers to test questions;
 $N1$ – total number of test questions; $n2$ – number of correctly answered tasks; $N2$ – number of offered tasks;
 $n3$ – number of correctly solved tasks; $N3$ – total number of offered tasks.

The given example shows that the student answered to test questions for 80%, accomplished tasks for 66,7% and solved the tasks for 100%. Now we need to figure out the average coefficient of acquisition on this section:

$$K1_{av} = (K1+K2+K3) / 3 \quad (K_{av} = 82,3\%)$$

Table 1: Factors, stimulating an independent work

Students	Factors, stimulating an independent work.						Σ	K _j
	1	2	3	4	5	6		
1 - 25	71	87,5	51,5	85	106,5	123,5	525	6
Σ ranks	2	4	1	3	5	6		
Δi	-16,5	0	-36	-2,5	19	36		

Table 2: Factors, stimulating students' independent work

Student	Factors, stimulating independent work						Σ ranks	T _j
	1	2	3	4	5	6		
1 - 25	57,5	90	47	128	142	60,5	525	8,5
Σ ranks	2	4	1	5	6	3		
Δi	-30	2,5	-40,5	40,5	54,5	-27		

Thus, one of the experts considers that this student acquired the material of this part for example to 82,3%, the rest experts put him the following coefficient of acquisition:

$$K_{2av}=85\%; K_{3av}=79\%; K_{4av}=76,2\%$$

$$\text{Then } K_{total} = (K_1+K_2+K_3+K_4)/4$$

$$K_{total}=80,6\%$$

where K_{total} – total coefficient of acquisition of the part by this student.

Further, from K_{total} of each student we can define K_{total} of all group.

We can determine the results of independent educational activity of each student and the whole group this way. Certainly, this system helps control and improves dynamics of progress of each student and the whole group.

In accordance with the task of our investigation on determination of the methods of increasing students' IEA efficiency, we set a task in front of students: to evaluate the importance of six factors, stimulating their independent work: Teacher's tasks; visiting lectures; a work with CTPST; private interest to the subject; accomplishment of laboratory works; work with additional literature. The questionnaire data are given in Table 2.

For quantitative evaluation of coherence of students' opinions let's use the coefficient of concordance [10, 12]. To find this coefficient (W), we firstly determine the sum of ranks on each factor from all students:

$$Q_i \sum_{j=1}^m X_{ij}$$

(shown as Σ rank in table). Then we calculate the difference between Q_i and average sum of ranks by the formula:

$$\Delta_i = \sum_{j=1}^m X_{ij} - Q_{cp}$$

where X_{ij} – i-st factor rank, acquired by j student, Q_{av} – the sum of ranks of all factors, n – total number of factors (6), m – number of students (25).

$$Q_{av} = \frac{1}{2} \cdot m \cdot (n + 1)$$

$$\text{Hence: } \Delta_i = \sum_{j=1}^m X_{ij} - \frac{1}{2} \cdot m \cdot (n + 1)$$

Further we determine the sum of squared difference on the formula: $s = \sum_{j=1}^n \Delta_i^2$

RESULTS

The investigation was conducted in experimental group, at the beginning of the study of the course.

In our case, (for example, of 3-rd student), there are two tied ranks (2,5), consequently:

$$T_3 \frac{1}{12} \cdot (2^3 - 2) = 0,5 \quad \text{The average sum } Q_{cp} = \frac{1}{2} \cdot 25(6 + 1) = 87,5$$

The deviation of the sum of ranks from average is consequently equal to (Δi): -16,5; 0; -36; -2,5; 19; 36. The sum of deviation square S= 3231,5 and finally, coefficient W = 0,3

Thus, the investigation of the factors, stimulating students' independent work shows that the latter has a weak opinions consistency (W=0,3).

The analysis of students' opinion proves the fact that students don't have the experience of independent work (in most situations), which significantly impacts on the education process and this, in its turn, proves the hypothesis of our investigation – the necessity of development of students' educational independence through CTPST.

In order to prove our hypothesis, the students were suggested using CTPST as an additional material, assisting in education.

The experimental investigation was ended with final questionnaire, which was conducted in the end of the term.

Certainly, for quantitative estimation of opinions primary questionnaire data were used, however, questionnaire results are quite different.

Thus, the sum of deviation squares composed $S=7886$; concordance coefficient: $W=0,74$

CONCLUSION

The investigation of the factors, stimulating student's independent work demonstrated that students' opinion (after application of CTPST), noticeably changed and composed a strong consistency ($W>0,7$). This, in its turn, means that the application of CTPST factors not only to formation of necessary knowledge and abilities, but also to the development of students' educational independence in the process of study of the course of cut of materials and instruments.

REFERENCES

1. Stancliff M. and Goggin M. D., 2007. What's Theorizing Got to Do with It? Teaching Theory as Resourceful Conflict and Reflection in TA Preparation WPA: Writing Program Administration. Council of Writing Program Administrators, 30(3).
2. Bochkina, N.V., 1991. Pedagogical basis of forming the student's independence. PhD thesis, Saint Petersburg.
3. Sang-Duck, S., 2009. A Case Study of an Andragogical Model in Design Education: Experiments in interactive teaching and learning in graphic design pedagogy Sang-Duck Seo. University of Nevada Las Vegas (UNLV).
4. Asanaliyev, M.K., 2001. Innovational technology of education in university educational system. The Nature of University Education Intellectual Development of students and Formation of creative Personality. International Scientific Practical Conference in Bishkek, pp: 4-24.
5. Zhanguzhinova, M.Y. and M.K. Asanaliyev, 2013. Pedagogical analysis of system of professional competence forming of future design lecturers. The International Conference on Social Science and Humanity, SCIEURO, London, pp: 8-28.
6. Asanaliyev, M.K., 2006. Technology of measuring the results of student's independent educational activity. Open education, Moscow, 1: 64-68.
7. Atymtaeva, B.E. and R.R. Dauletaliyeva, 2012. Problems of Teacher's Professional Competence Development, Using Informational Technologies. International Multidisciplinary Journal European Researcher, 31(10-1): 1708-1712.
8. Cogill, J., 2010. Chapter in publication: A model of pedagogical change for the evaluation of interactive whiteboard practice in Interactive Whiteboards for Education and Training: Emerging Technologies and Applications. (IGI Global: www.igi-global.com).
9. Journal of Education, 2004. Council of Technology Teacher Education and the International Technology Education Association, 15(2).
10. Asanaliyev, M.K., 2006. On the opportunities of activation of students' creative activity in educational process. Integrative function of pedagogical science in unique educational space. The international conference Europe and modern Russia, Erlangen-Nurnberg: MANPO: 90-94.
11. Trautner, Nell M. and E. Borland, 2013. Forthcoming. "Using the Sociological Imagination to Teach about Academic Integrity". Teaching Sociology.
12. Krupich, V.I., 1992. Theoretical basis of teaching of the school mathematical tasks solving, PhD thesis, Moscow.