

Formation of Main Components of Students' Cognitive Activity in High School

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Abstract: In this article we will discuss how the holding of a special and dedicated work helped to change the levels of formation of the major components of cognitive activity. Cognitive activity with the content aspect is a system of perceptual, mnemonic and intellectual activity and from the form - as an individual, joint, or pseudo-individual pseudo joint activity. We selected a set of methods and techniques of experimental research which has allowed to trace the dynamics of transformation of the "external" aspects of the learning process in the "inner" side of the learning process. Thus, the hypothesis of the necessary conditions that foster students' cognitive activity, which are the processes of transformation of co-dialogic students' cognitive activity in individual and dialogic students' cognitive activity was confirmed.

Key words: Cognitive activity • Formation • Cognitive functions • Co-dialogic students • Cognitive activity
• Individual and dialogic students • Cognitive activity

INTRODUCTION

In this article we will discuss how the holding of a special and dedicated work helped to change the levels of formation of the major components of cognitive activity.

The problem of the formation of main components of students' activity in high school were investigated in many works of foreign authors: Dinther, M. Dochy, F. Baeten, M. Kyndt, E.; Struyven, K. Ruijs, N.M.; Peetsma, T.T.D. Belfi, B.; Goos, M.; De Fraine, B. Mager, U.; Nowak, P. [1-5].

For the subsequent formative phase of the study should solve the following objectives:

- To identify opportunities for the most effective forms of cognitive activity of students in improving their professional training;
- To activate the process of formation of the cognitive activity of students, carrying out it creative, specific to their chosen profession;
- To reveal the major untapped reserves of specialized disciplines and practices in shaping the cognitive activity of students;
- To trace the dynamics of the formation of educational and extracurricular cognitive activity of students.

The Main Part: Assessment of the state of formation was carried out in three phases on the basis of the received

and collected factual information of students of various courses and faculties.

In the structure of the formative experiment identified three phases of the study, where the importance had place that we purchased special designed courses on the psychology of cognitive activity of students.

When discussing a timely topic or its most important aspects taken into consideration the following factors and issues:

- Widely used in the problematic issues;
- Were used various connection and interdependencies of analyzed problems and issues;
- The impression of the "round table" discussion in which students tried to form more frequently and act reasonably to defend their point of view;
- Created an atmosphere of informality and openness in the presentation of views, including criticism, self-criticism, controversial statements.

Note that the success of the operation and training program data specific courses provided by the presence of and compliance with certain conditions, the most important of which can be considered as such:

- A skilled professional approach in the development of teacher training topics, informative focus which is based on new developments, topical issues of contemporary psychology;

Table 1: The dynamics of formation of levels of cognitive activity of students (based on the formative experiment - as a percentage).

Criterion of cognitive activity	Study course	High level	Medium level	Low Level
1. Personal	3 course	20.8 %	54.5 %	24.7 %
	4 course	26.7 %	71.1 %	2.2 %
2. Qualifying	3 course	19.1 %	52.3 %	28.6 %
	4 course	20.2 %	58.1 %	21.7 %

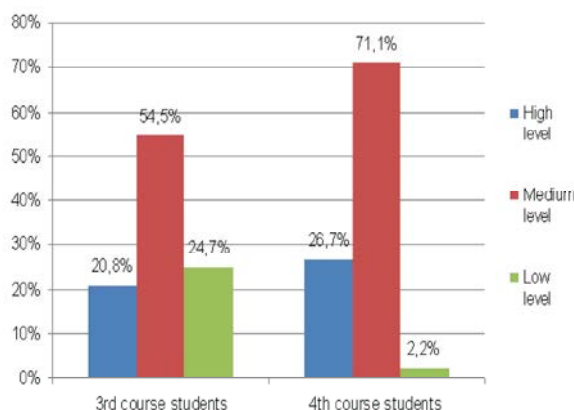


Fig 1: Personal criterion of cognitive activity.

- Active use in the classroom teaching and search problems, a discussion of the method of synthesis of the material;
- The development of students' psychological observation, intellectual abilities, conscious of a critical attitude to the study questions volitional efforts to overcome difficulties.

In the first phase formative research - 5 term - students were already familiar with the basic theoretical and practical terms the psychology of cognitive functions, trained to diagnose during the observations at the lectures and practical lessons. As an incentive, the cognitive activity of students, we used a variety of tasks and the study of scientific and methodological and practical literature.

In the second stage of the formative research - 6 term-works were carried out, aimed at activation of students' cognitive activity through the mastery of creative methods of research, revealed the importance of scientific knowledge in the professional formation of future specialists.

In the third phase of the formative experiment - 7-8 terms - checks the validity of our propositions and methods of teaching students in the classroom program of our special courses on the psychology of cognitive functions. Obtained during the diagnostic results indicate that the strengthening of the cognitive-active attitude of students of pilot groups for the upcoming independent professional activity.

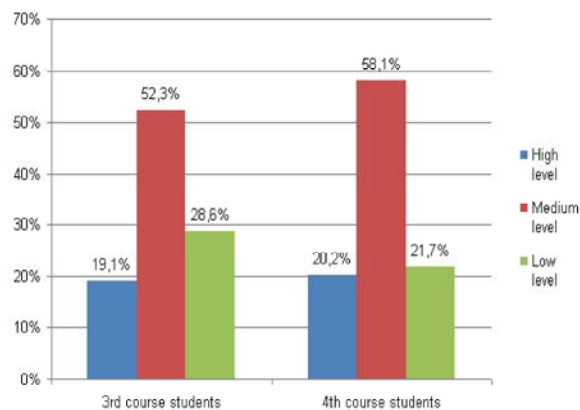


Fig 2: Qualifying criterion of cognitive activity.

All in all the formative stage of the study 246 students participated. Checking the level of formation of the cognitive activities of students of different specialties performed by us in view of the selected and the above criteria and key performance indicators (signs). To test the basic criteria and indicators (signs) of the cognitive functions formation of the methodology of diagnosis with an appropriate psychological tool.

To test the selected criteria and indicators (signs) of the cognitive functions formation following psychological techniques were used: scaling (scale relationships, intervals of the order), ranking, rating, self-and mutual evaluation method of component analysis.

The dynamics of the readiness of students from different faculties in general form are shown in the following Table 1 (Fig. 1, 2).

The results suggest that a focus on the results of experimental work have shown marked and specific changes in the levels of formation of the main features of the cognitive activity of students, beginning from third year and, above all, not only in the personal sphere, but also the activity. Now most of the students and especially graduate courses, are characteristic of creativity and creative levels of reproductive decisions of cognitive tasks and only a small number of students remained the same - the level of the reproductive decisions of cognitive tasks.

Conducted a comparative analysis of the formation levels of the basic parameters of the students' cognitive activities on the basis of the final "cuts" indicate,

Table 2: The severity of cognitive motives of 1-4 grade students and teachers.

Motives of cognitive activity	Students				School teachers	Additional selection
	1 Course	2 Course	3 Course	4 Course		
1. Opening of the new facts	3,6	3,5	4,2	4,2	4,1	2,1
2. Self-development, learning of new ways to work	3,3	3,7	4,1	4,3	4,2	2,7
3. Interest in the fields of knowledge, process knowledge	3,1	3,5	3,7	4,1	4,0	2,9
4. Expressions in cognition	3,2	3,3	3,6	4,2	4,0	2,1
5. Cooperation	3,5	3,7	3,6	4,3	4,2	3,3
6. Researches	2,8	3,5	3,7	3,8	3,7	2,2
7. Responsibility for the results of scientific work	2,3	2,9	3,5	4,2	3,5	2,1
8. Achievements in knowledge	3,3	3,8	3,9	3,9	3,8	2,3

Table 3: Dynamics of average number of groups identified by the test ISCA students of different specialties.

Specialty	Classification first		Classification second	
	Before experiment	After experiment	Before experiment	After experiment
1. Psychology	4,12	4,82	4,73	5,26
2. History	4,84	5,12	5,24	5,76
3. Physical Education and Sport	3,92	4,24	4,36	4,80
4. Mathematics	4,82	5,26	4,48	5,12

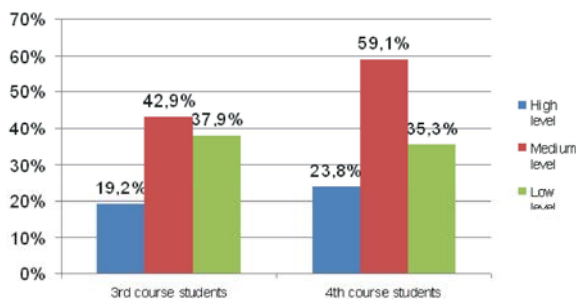


Fig 3: Comparative analysis of the formation levels of the basic parameters of the students' cognitive activities on the basis of the final "cuts"(in percent).

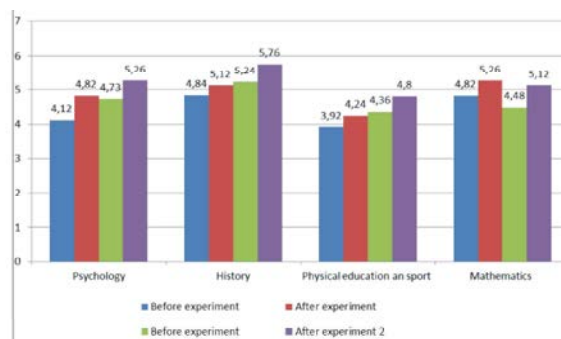


Fig 4: Dynamics of average number of groups identified by the test ISCA students of different specialties.

that the students of the experimental groups showed all criteria of personality and activity of components better results as compared with control group subjects (Fig 3).

These experiments show that despite the significant increase in expression of the internal to the process of teaching motives increases the severity of the motives of students' cognitive activity. Thus, the severity of the motives of opening a new, self-interest in the areas of knowledge and learning process, self-expression in cognition, collaboration, research, responsible for the results from graduate students as compared with the first course. The results of the comparative characteristics of a course of study are presented in Table 2.

In general, the task of forming a high-level students' cognitive activities focused on the development of those aspects of personality that are most appropriate to the individual-psychological make-up of the student's personality.

Individual style of cognitive activity can be regarded as one of the psychological mechanisms to provide students with the knowledge, skills and the formation of the learning style as one of the most important reserves for increasing the effectiveness of training. Under the individual style is usually described as a stable system of methods or techniques work. Depending on the typological characteristics of the nervous system can be folded individually stable polar techniques work, enabling

Table 4: Dynamics of the types of ISCA among students of different specialties (in percent).

Specialty	Analytic-synthetic style		Synthetic-analytic style		Balanced style	
	Before experiment	After experiment	Before experiment	After experiment	Before experiment	After experiment
1. Psychology	48	54	42	43	10	3
2. History	24	28	61	64	15	8
3. Physical Education an Sport	16	20	62	64	22	16
4. Mathematics	54	58	38	40	8	2

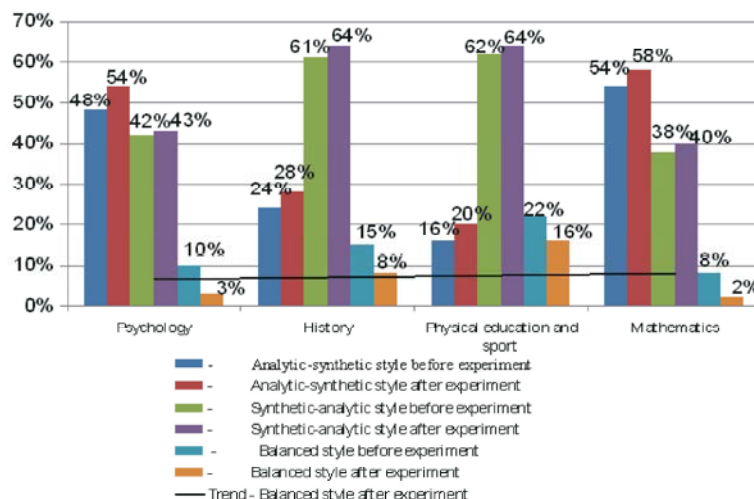


Fig 5: Dynamics of the types of ISCA among students of different specialties (in percent).

students to achieve the same results. Individual style serves both as a way of expressing a certain relationship to the person actually his activities and as a condition of formation in the future the subject of active-creative attitude towards it.

Particular care should be on the dynamics of the average number of groups identified by the test ISCA students of various disciplines and shown in Table 3 and Fig 4.

As the data presented in table 3 given us, there were positive changes in an individual style of the cognitive activity of students in mathematics in the direction of increasing the parameters of the first classification from 4.82 to 5.26 and the second classification - from 4.48 to 5.12, for students of psychology - from 4.12 to 4.82 and from 4.73 to 5.26 for the first and second classification. Similar changes occurred in the distribution of the main types of ISPD students of different specialties. The data obtained by us in Table 3 and are compared with the results of an experiment.

It should be noted that, as in the average number of groups identified by the test ISCA students of various specialties, significant changes have occurred in students in mathematics and psychology in the analytic-synthetic and synthetic-analytic styles of cognitive activity.

The prevalence of these styles of information processing is largely determined by socio-cultural factors and intelligent, but the severity of this dominance reflects the influence of individual personality factors. This can be judged by results and taxonomic analysis. In processing our data concerning the group of 20 students, 19 taxons were allocated, which means that each such student ISCA on its degree is unique, it is shown in Table 4 (Fig 5).

Draws attention to itself and the fact that due to individual characteristics of different students thinking in a joint cognitive and creative activities and hold different role positions, some of them act as analysts, while others act like critics or generators of ideas, scholars, diagnosticians, innovators, organizers, implementing foreign projects and others. A further check the efficiency of our work implied and evaluation of quality of the professionals involved in our experimental work. The complexity of this work was the need for comprehensive inspection of formed the knowledge and skills provided by the state standards of higher education and professional characteristics of Kazakhstan graduates. Complete enough material in this regard has been received by us at the state certification in all specialties of Aktobe University named after K. Zhubanov conducted by the Ministry of Education and Science RK in April 1999 by

Table 5: Generalized factors of quality training in the context of specialties.

No	Specialty	Task 1	Task 2	Task 3	Group factor in job	B %
1.	Psychology	M	NEM	M	0,82	82 %
2.	History	NEM	DNM	M	0,58	58 %
3.	Physical education and Sport	NEM	M	DNM	0,56	56 %
4.	Mathematics	M	M	M	1,0	100 %
	Index line	0,85	0,72	0,90	0,74	

the automated software certification institution. Also, take into account the results obtained by graduate students in industrial practice, which could serve us as a kind of an adequate model future careers. Therefore, comparison of performance indicators that can be modeled in the period of work experience with the parameters of the state standard and qualifying characteristics of a specialist could provide a valid measure for assessing the quality of training specialists.

To develop quantitative indicators of the quality of training we used the composite of learning - knowledge, skills and abilities that are considered by us as three different levels of training students.

In order to diagnose these levels, we used three types of tasks (S.M. Dzhakupov's method) to determine extent of formation of knowledge and skills students mathematicians, psychologists, historians and athletes.

The results of the tested special experts and evaluated by three-point scale: "matches - M", "not entirely matches - NEM," "does not match - DNM."

Complexity of evaluation ensured that the evaluation results of educational cognitive activity of students was conducted on the proposed criteria for us - personal and activity at three different levels of learning. For each level is determined by its own estimate, reflecting the degree of compliance with state standards. This assessment is recorded in the appropriate column of the table against the name of the student. Then we have calculated the coefficients of the individual and group quality of training in the context of each profession, whose results are presented in Table 5.

Analysis of the data presented in table 5 horizontal to evaluate process efficiency and quality of group students' cognitive activity of different specialties on three different criteria, which makes it possible to make targeted adjustments to the appropriate levels of cognitive activity of students in the final stage of training. A complex evaluation of individual and group cognitive activities of students on all three criteria can be made with the help of the coefficients of the quality of individual and group training (in the table given). According to our data obtained at a high level of quality training are students

of mathematics (ratio = 1.0) and psychologists (coefficient = 0.82), on average - students, historians (coefficient = 0.58) and students of physical education and sport specialty (coefficient = 0.56).

Comparison of the data table vertically determines the success of the students' cognitive activity in general as a reflection of the efficiency and quality of teachers in core subjects of each block subjects of the curriculum submitted for certification. Group rates for each level of quality in the range from 0 to + 1. Therefore, the closer the coefficient to one group, the educational process and therefore the quality of teaching is higher. And group, which rate is closer to zero, the appropriate level of organization of students' cognitive activity has more defects. The generalized coefficient of performance (according to our data it is 0.74) allows us to evaluate the effectiveness of the cognitive activity of the whole group of students majoring in all criteria.

CONCLUSION

Thus, a comprehensive analysis of all we received as a result of experimental work of the coefficients makes it possible to obtain a sufficiently complete picture of performance and quality of training at the final stage of university studies and computing the data obtained in the course of our experimental work, suggest that we developed and proposed method of forming the students' cognitive activity yielding positive results and can be implemented and used in the practice of preparing students of various specialties for independent practice in various industries and social services.

We selected a set of methods and techniques of experimental research which has allowed to trace the dynamics of transformation of the "external" aspects of the learning process in the "inner" side of the learning process. Thus, the hypothesis of the necessary conditions that foster students' cognitive activity, which are the processes of transformation of co-dialogic students' cognitive activity in individual and dialogic students' cognitive activity was confirmed [6].

REFERENCES

1. Dinther, M. and F. Dochy, 2011. Segers, M. Factors affecting students' self-efficacy in higher education. *Educational Research Review*, 6(2): 95-108
2. Baeten, M., E. Kyndt, K. Struyven and F. Dochy, 2010. Using student-centred learning environments to stimulate deep approaches to learning: Factors encouraging or discouraging their effectiveness. *Educational Research Review*, 5(3): 243-260
3. Ruijs, N.M. and T.T.D. Peetsma, 2009. Effects of inclusion on students with and without special educational needs reviewed *Educational Research Review*, 4(2): 67-79
4. Belfi, B., M. Goos, B. De Fraine and J. Van Damme, 2012. The effect of class composition by gender and ability on secondary school students' school well-being and academic self-concept: A literature review. *Educational Research Review*, 7(1): 62-74
5. Mager, U. and P. Nowak, 2012. Effects of student participation in decision making at school. A systematic review and synthesis of empirical research. *Educational Research Review*, 7(1): 38-61
6. Mambetalina A.S., 2011. Formation of individual-dialogic cognitive activity. LAP LAMBERT Academic Publishing GmbH & Co. KG, Heinrich-Böcking-Str. 6-8, 66121 Saarbrücken, Germany, pp: 1-66.