Middle-East Journal of Scientific Research 13 (Socio-Economic Sciences and Humanities): 115-120, 2013
ISSN 1990-9233

DOI: 10.5829/idosi.mejsr.2013.13.sesh.1421

The Learning Process at Forming the General Fund of Semantic Structures in Joint Activities

Alua Sabitovna Abdrakhmanova

Teachers Retraining Institute of Karaganda Region, Karaganda city, Kazakhstan

Abstract: This article is based on the results of the dissertational research on the problems of the psychology of learning. The learning process is revealed by the author through subjects interaction, during which the general fund of semantic structures is formed (GFSS). GFSS, according to the results of the study, is a condition for effective joint activity of people. Based on the concept of Professor S.M. Dzhakupov, the co-dialogical cognitive activity is formed only when the general fund of semantic structures is formed. Disclosure of this phenomenon and its diagnostics have become the focus of this paper. The article describes the stages of GFSS formation, its significance for interaction and learning, methods of diagnostics of the general fund of semantic structures and provides an example of research on the impact of GFSS formation on learning. The study involved 500 teachers, of whom 250 were in the control group and other 250 teachers participated in the experimental group. The study was focused on the phenomenon of GFSS and its impact on learning. The obtained results answered the questions: what affects the GFSS formation in interaction and how it in turn affects people during training.

Key words: Joint cognitive activities · The general fund of semantic structures (GFSS) · Efficiency of interaction · Communication, training · Active psychological techniques of communication · Interaction subjects · Co-dialogic cognitive activity (CDCA) · Psychological research · Model of interaction

INTRODUCTION

The modern world pedagogy is constantly modernized. The new demands of society require new skills, competencies and knowledge from the teacher. The teacher today should outperform the students in all areas, but unfortunately this does not always happen in reality and it is not always possible for the teacher. Children are influenced by many interactive factors in their world. For example, this is virtual computer games. Children like them, because they are designed based on their interests, age, abilities, skills, etc. And if the lessons at school continue to be of the same type, boring, transmitting only knowledge, the children will apprehend neither teachers nor school. Therefore, today a lot of attention is paid to the technology and pedagogy of teaching and learning and the activities of teachers are studied. Thus, many of today's researchers study mechanisms of interaction in the classroom, while learning [1, 2, 3]. For example, Maaike D.Endedike and Ian D. Vermunt in their study [4] found certain patterns in the training activities. They emphasized that the learning process is dependent on the relationship of teacher and student. This means that majority of students admit the importance of active learning and the teacher's ability to organize the process of training and apply appropriate strategies.

The study referred to in the article [5], considers the process of learning as an active process [6]. The activities of teachers and students are considered by us as a joint single interaction. In this process, all the teacher and the student are active and this in turn is possible only with the use of modern approaches and technologies of learning and teaching. The examples of implementation and effectiveness of these approaches and techniques were the results of the following studies. They show the influence of a variety of approaches and technologies on the development of consciousness [7] and on the increase of motivation and interest in learning [8]. However, our research is aimed at understanding of the mechanism for effective communication and interaction with other

Corresponding Author: Abdrakhmanova, Teachers Retraining Institute of Karaganda Region, 42 Zhanibekova Street, Karaganda city, Kazakhstan.

people. Based on the ideas of L.S. Vygotsky [9] and A.N. Leontiev [6], who noted the important role of communication and cooperation being essential for education and the system of psychological operations, as a new activity of verbal thinking [9], we have continued the idea about the central importance of the formation and development of consciousness in the learning process.

The principles of such interaction are presented in detail in the concept of co-dialogic cognitive activity of Professor S.M. Dzhakupov [10]. The author describes the structure of the learning process as a unity of the didactic and psychological systems, describing the development of student-student dyads in co-dialogic cognitive activities: the subjects of the educational process = personalities = subjects of training activities. The system of education was presented by S.M. Dzhakupov in the form of triune scheme: a meta-level, macro-level and micro-level. Changes in cognitive activities that occur at every level, lead to a more effective decision-making in the light of revealing the resource of the dyad teacher-student. In the concept, the educational system is described through the indicator of Co-Dialogic Cognitive Activity (CDCA) – the General Fund of Semantic Structures (GFSS) [11].

Based on this concept, we have drawn up a scheme of the lesson. (Table 1).

Formation of the general fund of semantic structures is possible with the use of psychological techniques, since active methods form the cognitive motivation, i.e. form a need for new knowledge, orient students not to increase the volume of knowledge (as it happens in the traditional model of education), but to explore, develop and search for new solutions to problem situations.

Having analyzed and summarized the conceptual ideas of Professor S.M. Dzhakupov, we have drawn a schematic model of training effectiveness, which served as a basis of the conducted training (Fig. 1).

This model includes psychological training with the elements of Erickson's hypnosis techniques, which aims to create a common fund of semantic structures and hence to form co-dialogic cognitive activity. The model is a scheme of realization and formation of the stages of co-dialogic cognitive activity through active learning, solving training problem, through psycho-techniques and implementation of specific training goals. The process of forming the general fund of semantic structures in accordance with Dzhakupov's concept is traced at the level of verbal and nonverbal behaviors of students. In this study [12] we distinguished and specified these behavioral components (Table 2).

To ensure the formation of the general fund of semantic structures in the experimental group of teachers we carried out training under the program, based on the psychological techniques and active training methods. Training was conducted in parallel in the control group of teachers according to the regular program. So, we implemented the model of interaction in the class. The volume of training is 81 hours. All in all, the study involved 500 teachers from Karaganda region. The efficiency of model adaptation was measured by the following methods:

- Observation using the author's standardized monitoring form subjected to testing in order to diagnose the levels of GFSS formation in CDCA.
- Evaluation questionnaire to study the degree of activity and independence of CDCA participants.
- Project-based method as an indicator of learning process effectiveness.

Using the method of the "Monitoring form" the formation of the general fund of semantic structures in co-dialogic cognitive activity is confirmed only if its performance, the effectiveness and efficiency, have a positive dynamics and show a positive cross correlation.

Thus Figure 2 shows the average indicators of effectiveness and efficiency at the main stages of the class activities in the experimental group.

According to the data it is apparent that the indicators of effectiveness and efficiency increase from stage to stage and that they are the highest at the third stage of CDCA.

The behavior components maximum manifested during interaction are found at the third stage, i.e. during mental activity, which indicates the complete forming of the general fund of semantic structures in the course of training.

According to the data obtained in the control group, the following average indicators for efficiency and effectiveness of the activity may be noted in Figure 3:

In this group the maximum apparent were the components of initial stages of interaction and the least apparent were at the stage of the developed mental activity. This indicates lack of development of the last stage.

In the experimental group, the effectiveness and efficiency of interaction exceeds indicators of the control group. To calculate the reliability of differences we used Student's T-test, which on effectiveness was equal to $t = 2.7$ ($p \leq 0.01$) for the first stage, $t = 2.24$ ($p \leq 0.05$) for

Table 1: The scheme of psychological structure of the learning process

Stage of the lesson	Stage of CDCA	Criterion of GFSS	Form of CDCA	Stages of GFSS formation
1	2	3	4	5
Introductory part of the lesson	The initial stage of the joint intellectual activity	The evolving process of goal formation The evolving process of joint goal formation	Pseudo-joint in the form Pseudo-joint in the form and cognitive and practical in content	Goal reconstruction The predominance of non-verbal components
The main part of the lesson	Stage of transformation of pseudo-joint intellectual activity in joint activity	GFSS formation Exchange of meanings of activities	Joint in the form and cognitive in content The developed intellectual joint activity	Identification of meanings Emotional and value reflection
The final part of the lesson	Stage of developed co-intellectual activity	Unity of thought and speech Pseudo-exchange of statements of purpose	Qualitatively new level of the developed co-intellectual activity Pseudo-apprehension of the formulation of the partners' objective Interiorization	Reduction of verbal components Dialogization of monologue Monologization of dialogue

Table 2: Emotional and behavioral components of GFSS manifestations

Stage of CDCA	Criteria of GFSS	Emotional and behavioral components of GFSS
Stage of pseudo-joint practical activities	Reconstruction of goals	Inclusion Activity Statement Exclamation
	The predominance of non-verbal components	Emotive facial expressions Gestures Match of action, movements
Stage of transformation of pseudo-joint practical activity into pseudo-joint intellectual activities	Identification of meanings finding inconsistency Emotional and value reflection	Expressing contradictions Informal interaction Life examples Same emotions Emotive speech
The stage of development of mental activity	Reduction of verbal components	Take up teachers' monologue Take up another student's monologue
	Dialogization of monologue	Support one student's statement Express common point of views
	Monologization of dialogue	Understanding at a glance Students speak using the words of their teacher Students discuss the topic after the lesson

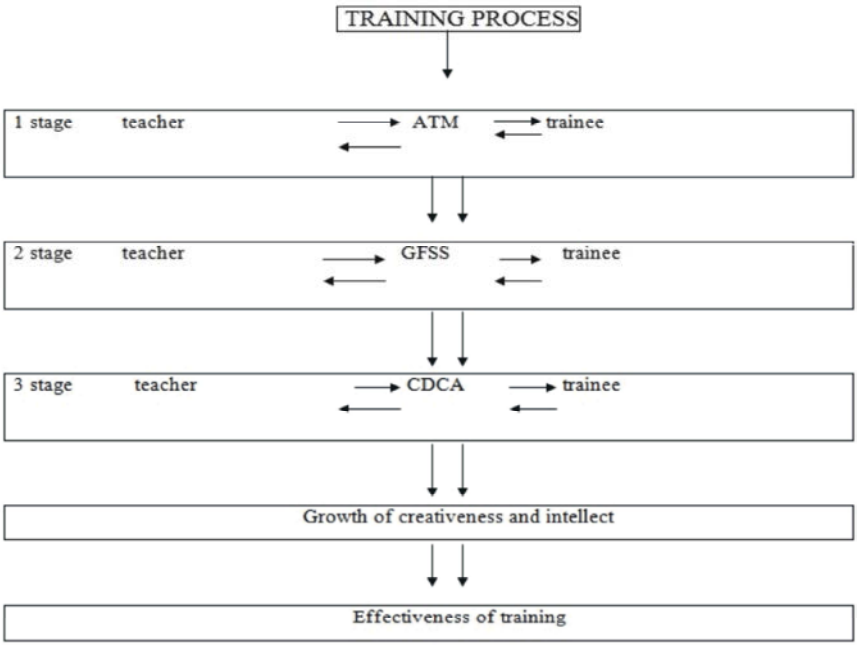

Fig. 1: Model of training process effectiveness

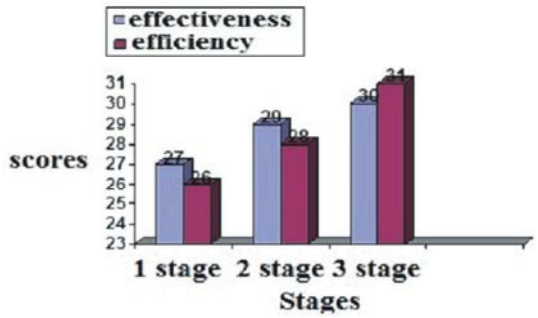

Fig. 2: The dynamics of indicators according to the Monitoring Form in the experimental group of teachers

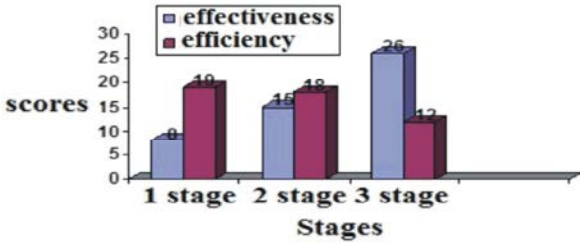

Fig. 3: Dynamics of indicators according to the monitoring form in the control group of teachers

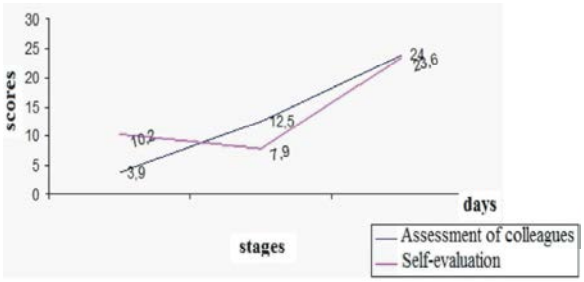

Fig. 4: Indicators of self-evaluation and assessment of colleagues in the experimental group

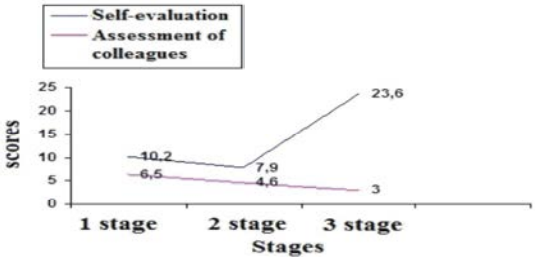

Fig. 5: Indicators of self-assessment and assessment of colleagues in the control group.

the second stage and t = 2 (p = 0.05) for the third stage. In terms of efficiency between the two groups t = 2.73 ($p \leq 0.01$) for the first stage, t = 2.7 ($p \leq 0.01$) for the second stage and t = 2.85 ($p \leq 0.01$) for the third stage of interaction;

These indicators of T-test prove the truly reliable difference between the above mentioned results.

The results, obtained by the method of "Evaluation Questionnaire", showed that self-evaluation and performance assessment of colleagues in the experimental group rose to the third stage.

Self-esteem of participants at the first stage was equal to 10.2 (average level), at the second stage it slightly decreased to - 7.9 points (low level) and at the third stage rose to a high level - 24 points. Assessment of colleagues increased from stage to stage - 3.9 points (low level), 12.5 points (average) 24 points (high level).

According to the calculated Student's T-test, the difference between the indicators exists at the first stage with the probability of 0.99.

At the second stage the difference between indicators is 4.6 points, which is less than at the first one, at that the self-esteem during this period slightly decreased, at that the assessment of others increased by 8.6 points.

This may indicate the completion of the adaptation and the introductory phases and the beginning of the formation of the general fund of semantic structures in joint activities. The difference at this stage exists with a probability of 0.95.

At the third stage the differences in the indicators of self-evaluation and assessment differ only by 0.4 points, which shows almost a coincidence of evaluations and this in turn may indicate at the coincidence of the evaluation of proper condition and its assessment by colleagues (Figure 4).

To fully confirm the formation of the general fund of semantic structures in co-dialogical learning activities, we compared the results of two methods with each other and carried out the Pearson's correlation analysis on the significance of changes in the interaction process, which gave a positive correlation between the two methods, at ? = 0.68 ($p \leq 0.05$).

In the control group the assessments showed a different picture. Self-esteem of participants by the end of the classes has grown and the assessment of colleagues decreased (Figure 5).

These results indicate that the general fund of semantic structures in the class is not formed.

According to the monitoring form and the questionnaire data it is apparent that interaction in the groups during the three stages has a diverse dynamics of development. In the experimental group, we can clearly see that the general fund of semantic structures begins to form at the second stage. Being an indicator of formation of co-dialogical learning activities, it shows its formation by the third stage. In the control group this interaction is not observed. Moreover, by the end of the classes we observe individualization of the process rather than a commonality, since self-esteem and effectiveness of participants grow, whereas the peer reviews and interaction efficiency decrease. This is evident from the results of the form and the questionnaire, since all behavioral components are reflected both by the outside observers and by the participants of the process.

The results obtained using the monitoring form and assessment questionnaire positively correlate with each other ($p = 0.68$ ($p \leq 0.05$).

As another instrument for researching creativity and diagnostics of the dynamics of co-dialogical learning activities, we used the method of projects.

At the first stage, before the project implementation, teachers were introduced to additional technologies that could be useful in performing tasks.

The indication of the high level of creativity, in this case, was a retreat from existing technologies in to the development and synthesis of other types, methods and means of material presentation.

The work on the project at the first phase - the "project of the existing school," in the experimental and control groups resulted in the following.

In both groups the participants (100%) used the existing technologies and used them in the project. In the experimental group, 94.5% of all projects were carried out by the technology "SWOT-analysis" and in the control 96% of the projects are performed using this technology. Other participants in two groups used the existing technology for building the development strategy.

These technologies require a simple listing of the key issues and aspects of the existing school.

Quantitative analysis of the results on the parameters of estimates is reflected in the figure.

We notice an increase of points at each stage, hence, the quality of the projects, evaluated by the assessment parameters is also increasing (Figure 6).

Projects of the third stage, e.g. the project of modern school, were the most creative, original, relevant and topical and correctly used the research methods. In the work on this project, in contrast to others, we observed

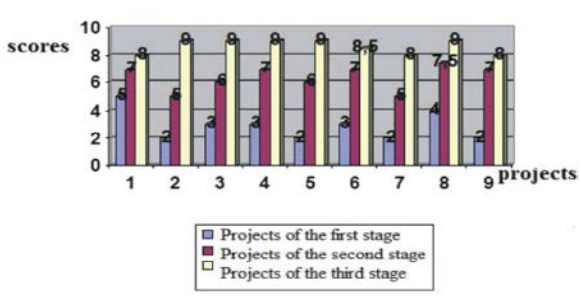

Fig. 6: The indicators of the parameters of project evaluation in the experimental group

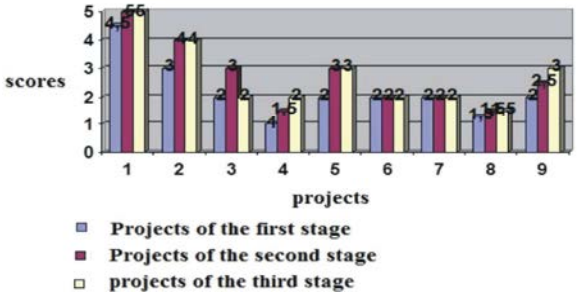

Fig. 7: Indicators of project evaluation parameters for the control group

activity, cooperation, complementarity of the project participants, as well as the ability to give laconic and well-reasoned answers to the opponents' questions. The overall average scores for all the projects are:

- Project - 2.8 points - the lowest level;
- Projects - 6.4 points – medium level;
- Project - 8.6 points - the highest level.

To test the reliability of differences between the indicators of the projects' quality, we calculated Mann-Whitney test criterion, which was equal to $U = 25$ ($p \leq 0.01$) between the indicators of the first and the second p rojects and $U = 25$ ($p \leq 0.01$) between the indicators of the second and the third project, which confirms the reliable differences of these parameters and the growth of creative approach, the level of project implementation at each stage of interaction, that is, at the stage of formation of the general fund of semantic structures in co-dialogic cognitive activity.

The work of the control group is reflected in the diagram (Figure 7).

The average assessments for all stages were distributed as follows:

- Project - 2.2 points - the lowest level;
- Projects - 2.7 points - the lowest level;
- Project 3 - 2.7 points - the lowest level.

As for the qualitative analysis of the projects, performed in the control group, all of them contain the existing schemes and models, taken from the lecture materials; the teachers of this group could not create their own project model. This may indicate a mediocrity of thinking, its fixedness and inflexibility, that is, in this group the participants were not ready to creative activities.

The differences between the levels of quality of the completed projects in the groups at the first stage were not detected in fact. As to the second and the third projects the differences are reliably proved using the Mann-Whitney criterion - $U = 38.5$ ($p \leq 0.05$).

CONCLUSION

Thus, the results of the study can bring us to the conclusion that the correct joint interaction (when forming GFSS) will form the conditions for more effective learning. The experimental data support the position of our conceptual idea that the efficiency of training process depends on the level of CDCA development. The psychological training revealed that teachers are actively involved in such a form of applied psychology, as training sessions and actively use the proposed diagnostic material in their classes and classes of their colleagues.

REFERENCES

1. Kim, Thi and Anh Dang, February 2013. Identity in Activity: Examining Teacher Professional Identity Formation in the Paired-Placement of Student Teachers. Teaching and Teacher Education, 30: 47-59.
2. Buitink, Jaap, January 2009. What and How do Student Teachers Learn during School-Based Teacher Education. Teaching and Teacher Education, 25(1): 118-127.
3. Kimonen, Eija and Raimo Nevalainen, August 2005. Teaching and Teacher Education, 21(6): 623-635.
4. Endedijk, Maaike, D. and Jan D. Vermunt, March 2013. Relations between Student Teachers' Learning Patterns and their Concrete Learning Activities. Studies in Educational Evaluation, 39(1): 56-65.
5. Abdrakhmanova, A.S., 2007. Study of the Formation of the General Fund of Semantic Structures in Secondary School Teachers. Bulletin of "Kaynar" University, 1/1: 69-72. Almaty.
6. Leontiev, A.N., 2005. Activity. Consciousness. Personality. New York: Smysl, Akademiya, pp: 352.
7. Ron Sun, 1 October 1997. Learning, Action and Consciousness: a Hybrid Approach toward Modeling Consciousness. Neural Networks, 10(7): 1317-1331.
8. Berger, Jean-Louis and Stuart A. Karabenick, June 2011. Motivation and Students' Use of Learning Strategies: Evidence of Unidirectional Effects in Mathematics Classrooms. Learning and Instruction, 21(3): 416-428.
9. Vygotskiy, L.S., 1996. Pedagogic Psychology, Ed. V.V. Davydov. Moscow: Moscow-Press, pp: 536.
10. Dzhakupov, S.M., 2004. Psychological Structure of the Learning Process. Monograph. Alamty: Kazak University, pp: 310.
11. Dzhakupov, S.M., 2000. Theoretical and Applied Problems of Socialization. Almaty: Kazak University, pp: 86.
12. Abdrakhmanova, A.S. and A.T. Izakova, 2005. One of the Psychologized Ways to Address Efficiency and Effectiveness of the Learning Process and their Diagnostics. In Proceedings of the XXVIII Scientific and Practical Conference of the Faculty, Graduate Students, Undergraduates and Students of KarSU n.a. E.A. Buketov. Karaganda: Publishing House of KarSU, pp: 260-263.