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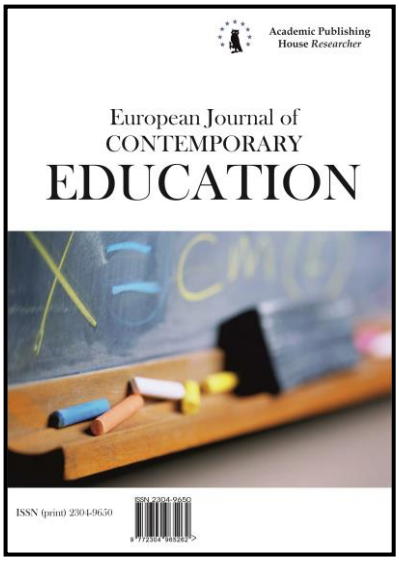

Formation of Cognitive Motivation in Junior School Age Children in Institutions of Supplementary Education

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Abstract

The article presents conceptual ideas, experience and results of the formation of cognitive motivation in junior-school age group children in extracurricular activities institutions. Such ideas include the junior school-age children motivation's structure, characteristics, basic pedagogical conditions, educational contents, and the criteria of the cognitive motivation's formation. Novelty of the presented research is in defining the realization mechanism of pedagogical conditions for the formation of cognitive motivation in children of junior school age at institutions of supplementary education. The mechanism is based on equal relations and participation of children, parents and the pedagogue, it includes three interlocked stages: motivational-stimulating, substantive, and reflexive-evaluative. In the course of research, conventional theoretical methods as well empirical methods were used, the preferred one of which was a pedagogical experiment. The authors explored the specifics of the formation of cognitive motivation in junior school age children in institutions of supplementary education. The results of the study proved the effectiveness of the proposed concept of the formation of cognitive motivation in junior students. Finally, it was concluded that the proposed concept is feasible and promising. The developed and experimentally tested pedagogical conditions for the formation of cognitive motivation in junior school age children can be widely used in institutions of supplementary education.

Keywords: junior-school age children, cognitive motivation, pedagogical conditions, institutions of supplementary education.

1. Introduction

Today, no one needs to be convinced that teaching a foreign language to junior-school age children is an acknowledgment of an objectively existing social interest in learning foreign

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languages and confirming the importance of the subject for the implementation of promising tasks of diversified personality development.

In this regard, the subject Foreign Language, which introduces the child to humanitarian knowledge and foreign language culture, gradually enters the life of junior students from the second grade of secondary school. The studies of L.S. Vygotsky, A.A. Leont'yev (Leont'yev, 1985), A. Gesell, E. Lenneberg, E. Oxar, V. Penfield, L. Roberts and practice show that children at this age learn the language more easily than older students. At the same time, the psychological and pedagogical analysis of teaching a foreign language in primary school indicates that there is a problem of retaining the initial interest in the language and the formation of a stable cognitive motivation for this subject. The emergence of this problem is primarily associated with a small number of study hours allocated to this subject and the lack of specific recommendations on the formation of cognitive motivation for a foreign language in modern junior students.

Therefore, realizing the importance and necessity of learning a foreign language and the formation of sustainable motivation of younger students to a foreign language, parents see the need of their children for additional and effective classes in this subject. In connection with the problem that has arisen, parents turn to institutions of supplementary education, whose significance both for a person and the society on the whole has been growing lately.

In supplementary education institutions, the child's cognitive motivation acquires new stimuli for its development due to the variety of content, activity forms, and communication. State requirements on supplementary education are aimed at designing educational programs as a means of developing the child's cognitive motivation, abilities, formation of his/her personal culture, his/her introduction to universal human values in the process of joint activities with peers and adults alike.

2. Materials and methods

The aim of the study was to develop, substantiate and test the pedagogical conditions for the cognitive motivation formation in junior-school age children in institutions of supplementary education. The study addressed the following tasks: to identify the specifics of the cognitive motivation formation in junior-school age children in institutions of supplementary education; to develop and substantiate the pedagogical conditions for the cognitive motivation formation in junior-school age children in institutions of supplementary education; to test these pedagogical conditions for the cognitive motivation formation in junior-school age children.

To achieve the set objectives, the following research methods were used: theoretical analysis of philosophical, psychological, pedagogical and methodical literature on the research problem; survey-diagnostic and ascertaining methods (conducting polls, testing, interviewing, and observation); ascertaining and formative experiments; methods of statistical processing of the research results.

The experimental research study was conducted at Private Educational Institution (PEI) *The Social and Psychological Assistance Center for Children, Teenagers and Youths* (*Ulybka* (Smile) and *Mashen'ka* children's studios) in the city of Kirov, Russia. 60 children of junior-school age took part in the experiment: 30 – in the experimental groups, 30 – in the control ones. The study was conducted from 2003 through 2006 and included three stages.

At the first stage (2003–2004), a theoretical analysis of psychological, pedagogical and methodical literature on the research topic was carried out. At this stage, the object, subject, purpose, tasks and the working hypothesis of the research were determined, the ascertaining experiment was conducted. At the second stage (2004–2006), the organization and conduct of experimental work on the implementation of pedagogical conditions for the cognitive motivation formation in children of junior-school age institutions of supplementary education were carried out. At the third stage (April 2006 – October 2006), analysis, synthesis and systematization of the research results, statistical processing of the results of the experimental work were carried out.

Scholars studied the problem of motivation formation from various viewpoints: psychological (B.G. Ananiev (Ananiev, 1980), V.G. Aseyev, L.I. Bozhovich, V.K. Vilyunas (Vilyunas, 1990), I.A. Zimnyaya (Zimnyaya, 2004), Ye.P. Il'in, V.I. Kovalev (Kovalev, 1988), M.Sh. Magomed-Eminov, A.K. Markova, V.S. Merlin, P.V. Simonov, D.N. Uznadze, A.A. Fayzullayev, P.M. Yakobson (Yakobson, 1969) et al.); unity of mind and act (L.S. Vygotskiy (Vygotskiy, 1991), P.Ya. Gal'perin, A.N. Leont'yev (Leont'yev, 1975), S.L. Rubinshteyn et al.); theory of holistic process of personality

formation (M.A. Danilov (Danilov, 1960), A.A. Kirsanov et al.); from the pedagogical viewpoint, as one of the paramount factors affecting the efficiency of the educational process (Yu.K. Babanskiy (Babanskiy, 1985), A.S. Belkin, O.S. Grebenyuk, V.S. Danyushenkov (Danyushenkov, 1994), A.K. Dusavitskiy, N.G. Morozova, V.V. Repkin, G.I. Shchukina (Shchukina, 1979) et al.)

Analysis of psychological and pedagogical research works showed that the formation of a personality, i.e. its ability to form educational activity, the incentive to learn, the need for its own self-change began at the junior-school age. According to many researchers, at this very age restructuring of the emotional-motivational aspect occurs, it becomes more complex, there are also changes in the hierarchy of motives (L.I. Bozhovich (Bozhovich, 1986), A.K. Dusavitsky (Dusavitsky, 1978), M.V. Matyukhina (Matyukhina 1984) B.B. Elkonin (Elkonin, 1974).

Formation of learning motives in general and cognitive motivation in particular, in children junior school age is one of the most important tasks of learning. On the one hand, junior school age children are characterized by a low level of cognitive motivation, on the other hand, this age is sensitive for the formation of this motivation, since it is during this period that at this very age restructuring of the emotional-motivational aspect occurs, it becomes more complex, there are also changes in the hierarchy of motives. Moreover, the motivational sphere of junior school age children, due to its dynamism, presents great opportunities for the formation of their cognitive motivation, so necessary for effective learning.

We have studied the structure of cognitive motivation in children of junior school age, which structure we view as a set of processes that are significant for the personality of the junior student. One can define the following components of the cognitive motivational structure of junior school age children: incentive, activity-related, and emotional-evaluative.

The incentive component focuses on the object, on a certain activity and is responsible for the successful action, for the transformation of a given action into a personal, meaningful and creating a positive attitude act, where the behavior required of the child is connected with his inner motives and values. The activity-related component makes it possible to determine the degree of activity of the junior school age child in his actions and his attitude to the content, nature and activity methods. The emotional and evaluative component reflects child's emotional experiences related to the performed activities and his own attitude towards his actions.

Analyzing the cognitive motivation structure of junior school age children, we determine its criteria and formation levels. To evaluate the completeness of cognitive motivation formation in junior school age children we consider the following criteria: the cognitive need, cognitive interest, the prevailing activity motive, personal significance, the prevailing activity nature, intellectual activity, emotions, and reflection.

Based on the research done by A.K. Markova (Markova, 1990), G.I. Shchukina (Shchukina, 1971), T.I. Shamova (Shamova, 1982), we relate the levels in the completeness of cognitive motivation formation in junior school age children to their attitude towards learning activity: the first level – neutral (passive) motivation, the second level – positive situational motivation, the third level – positive stable motivation, the fourth level – positive transforming motivation, the fifth level – personal creative motivation (Table 1).

Table 1. Characteristics of the levels and criteria of the completeness of the cognitive motivation formation in junior school age children

Criteria	Levels				
	1	2	3	4	5
Cognitive need	Absence of or a slight need for new impressions	The need for new experiences, attractive practical activities	The need for new knowledge, practical activities, there is a need for mental activity	The need for intellectual activity in mental act	The need for creativity, research activities, self-improvement

Cognitive interest	Situational curiosity rarely occurs and is short-lived	Situational interest, curiosity about the entertaining activity, Not requiring a lot of effort, in most cases game forms	Situational cognitive interest, curiosity, not only about the game forms, but also about more complex, effortful forms; there is interest in new facts	Sustained cognitive interest in various areas of knowledge, in content and methods of activity	Sustained cognitive interest in the content and methods of activity, in creativity, in self-education
Prevailing motive	Unsustainable narrowly social learning motives, the prevailing motives are those of avoiding problems, punishment	Situational narrowly social known learning motives, related to the superficial outward result, the prevailing motives are such as how to earn the teacher's praise, or that of parent, how to be better than the peers	Relatively sustainable cognitive motives, the desire to learn new things.	Sustainable developed activity-related cognitive motives, the prevailing motive is to learn new things in classes, to overcome difficulties	Sustainable developed activity-related cognitive motives, the prevailing motives are those of self-improvement and self-development
Personal significance	Absence of personal significance awareness, as the student doesn't understand the reason for learning a foreign language	Awareness of personal significance in the study of academic subjects correlates with the desire to get good grades, praise.	Personal significance begins to acquire a conscious character and is associated with the opportunity to take part in interesting practical activities.	Personal significance is of conscious nature and associated with the opportunity to acquire the skills and abilities that are necessary for successful activity now and in the future.	The personal significance in a certain activity, related to the possibility of expressing oneself, of self-improvement is clearly understood.
Prevailing nature of activity	Passivity in the performed activities; difficulty in performing activity by example	Handling activity based on templates and examples; when faced with difficulties, there is no desire to overcome them independently; in attractive activities there is a desire to step aside from the example	The ability to perform tasks without a pattern or example, with modified conditions; facing difficult tasks there's explicit readiness to perform them, but only with the help from a teacher or parents	Ability to reformatory and partially research activity based of the task, partial independence in the search for the means to solve the problem; there is a desire to create a product of creative activity, although with some external help	Creativity and autonomy in performing the activities prevail. Children offer original ways of solving the problem; they use additional sources of information to solve the problem; they independently make products of creative activity

Intellectual activity	Passive attitude to activity, fast-to-come fatigue	Activity is manifested only in certain situations, attractive activities; however, the ability to ask questions is still absent	Activity manifests itself in various deeds, but there is a ready switching to a lighter activity; children are able to ask questions on the learned topic, but are not yet able to ask questions aimed at finding the missing/lacking information	There is a reformatory activity; good performance; the desire to perform difficult tasks and solve problems; children are able to ask various questions	There is creative activity; children are able to stay active for a long time; the express very high performance; there is the desire to get into the essence of phenomena and their interconnection; theoretical understanding of phenomena is present
Emotions	Absence of emotional manifestations or negative emotions associated with boredom, self-doubt	Unsustainable positive emotions occur during the performance of activities, if there are no difficulties and in emotionally attractive situations; there is easy switching to more vivid emotional stimuli, that are not related to studying.	Positive emotions, enthusiasm, joy prevail, however, when confronted with difficulties children can display negative emotions and discontent. In general, there is a positive attitude towards learning.	There is vivid manifestation of sustained positive emotions, perseverance in overcoming the arising difficulties, optimistic spirit	There is absence of negative emotional manifestations even in cases of failure, an optimistic attitude in any situation, highly positive attitude towards the performed activities and to other people. Belief in oneself and one's own strength now and in the future.
Reflection	They put blame on other persons and circumstances. Inability to judge oneself from another person's perspective, no wish to analyze one's own actions	Self-assessment of some actions is possible, failures are explained by the difficulty of the assignments or the fact that the assignment is incomprehensible.	An unbiased assessment of one's own failures, if they were insignificant, is possible, child happily analyzes his/her successes.	Child objectively assesses his/her own successes and failures, however, he/she looks for the possibilities for change not in themselves, but outside.	There is pronounced objective self-evaluation and self-analysis; failures are explained by one's own errors; there are attempts for self-improvement planning

Analysis of psychological and pedagogical literature demonstrated, that the issue of the cognitive motivation formation has been studied, mainly in relation to general education.

Meanwhile, in the institutions of supplementary education, as practice shows, conditions for the cognitive motivation formation in junior school age children can be created.

Analysis of tasks, functions and basic ideas of the supplementary education (Asmolov, 1977; Gorsky, 1999; About development strategy..., 1995) has made it possible for us to determine the specific of the cognitive motivation formation in junior school age children in these institutions. It is determined by the fact that there is the possibility of integrating gaming, leisure-time and creative activities into the educational process. Junior school age children are given a free choice of the type of classes and the pedagogue, their own educational trajectory, corresponding to the individual characteristics of the method, pace and mode of activity. A small number of children in a group makes it possible to individualize the cognitive motivation formation process. The educational process in the institutions of supplementary education provides parents with the opportunity to directly participate in training sessions through the joint fulfilling of tasks, both at the training session and in the process of joint development of home projects, as well as while working on the "personal achievements album".

The nature of the cognitive motivation in junior school age children, as well as the specifics of its formation in supplementary education institutions, determined the choice of pedagogical conditions aimed at the cognitive motivation formation in junior-school age children in these institutions.

Having studied the psychological and pedagogical literature (Yakovlev, 2004; Evladova, 2002), and having analyzed the practical works, we assumed that the necessary pedagogical conditions for the cognitive motivation formation in junior school age children in supplementary education institutions may be the following:

- creation of a specially organized spatial subject-related environment based on the needs and interests of junior schoolchildren at each class-session;
- ensuring a conscious triune interaction of all participants in the educational process (children-parents-pedagogue);
- the use of a set of tasks of a problem-creative nature, ensuring maximum practical use of acquired knowledge in gaming, leisure and creative activities;
- the use of the pedagogical potential of a substantive assessment including a verbal-figurative analysis of the activity performed or being performed, both by the child and the pedagogue.

The implementation of the pedagogical conditions for the cognitive motivation formation in junior school age children in supplementary education institutions includes three interrelated and interdependent stages: motivational-stimulating, substantive and reflexive-evaluative. Each stage we conditionally correlated with the implementation of a particular condition.

The first stage – the stimulating one, is aimed at the formation of the incentive component of cognitive motivation, which includes the following aspects: cognitive need, cognitive interest, prevailing activity-related motive, and personal significance. At this stage, the first condition was implemented, and namely, the creation of a specially organized spatial subject-related environment based on the needs and interests of junior schoolchildren at each class-session. The formation of children's interest and creative abilities is based on the creation of a range of possibilities for searching, modeling and experimenting with various materials, which, at the same time, make it possible to make the activity more "lively". It can be a variety of balls, toy construction sets, skittles, multifunctional soft toy modules. With the help of the above-mentioned playthings, it is possible to create a new, special environment, which meets the objectives of this very class-session in the supplementary education institutions. At the same time, children and their parents can also take part in creating a comfortable and fascinating setting. It is of special importance to us to set up an achievements presentation area, where children could present their posters (personal or collective) as well as their projects.

The goal of the substantive stage, the second one, is to increase the level of intellectual activity; which activity is aimed at in-depth understanding of the essence of phenomena, their interrelation, at the process of obtaining knowledge; stimulation of creative activity. At this stage, the second and third conditions were carried out. Building a conscious triune interaction involves the inclusion of parents in joint activities on the cognitive motivation formation in children. Parents-pedagogue interaction occurred in the following instances:

- a poll among parents;
- counseling for parents on the cognitive motivation formation as well as on other issues of interest to them (personal, collective);
- openness of all class-sessions (parents either take an active role or look on).

The triune interaction of all the participants: children, their parents and the pedagogue was carried out through the following means:

- creating co-creative situations at the sessions;
- co-doing the homework (work on projects);
- keeping *personal achievement albums/diaries/logs* of each child.

The interrelated tasks include situations of interest, search-and-game tasks (based of well-known psychology mind-agility tasks); communication-oriented speech games; language games (spelling, lexical, phonetic and grammar ones); fairy tale and role-playing/acting. When conducting the sessions, the joint activities of children and their parents were organized in such a way that the child and the adult could act *on an equal footing*. Our experience has allowed us to conclude that the motivation of the junior school age child directly depends on the motivation of his/her parents, if a certain activity is of interest and importance to the parents, then it becomes of interest and importance to the child as well.

The third stage, the reflexive-evaluative one, is tied in with the analysis of the outcome as compared with the set objective, followed by the performance evaluation. At this stage, the fourth condition was implemented – the use of the pedagogical potential of a substantive assessment, which assessment includes a verbal-figurative analysis of the activities performed or being performed by both the junior school age child and the pedagogue. To implement this condition, we created certain situations in which junior schoolchildren could analyze and evaluate their actions, the outcomes of their work, the changes taking place in themselves, describe their emotions.

The pedagogical conditions for the cognitive motivation formation were tested in the process of our experimental work, which was carried out in three stages:

The first stage is the ascertaining experiment. At this stage, the work experience of supplementary education pedagogues was studied and summarized; the data on the level of cognitive motivation in junior school age children were collected and processed; a pedagogical conditions implementation mechanism was developed.

At the second stage (the formative experiment), the pedagogical conditions for the cognitive motivation formation in junior school age children in supplementary education institutions were implemented; we analyzed and corrected the preliminary results.

At the third stage (the closing experiment), the data of the ascertaining and the closing experiments were compared, and the effectiveness of the tested pedagogical conditions for the cognitive motivation formation in children of junior-school age institutions of supplementary education was analyzed.

To monitor the degree of cognitive motivation formation in junior school age children, we used certain picked diagnostic methods, that helped us study the states of the cognitive motivation component. In choosing theses diagnostic methods, we opted for them to overlap each other, creating conditions for achieving objectivity and reliability of the indicators of interest to us. The results of the cognitive motivation components formation study were made up of various data types, which made it possible to obtain versatile information about the formation degree of both a separate component and the formation degree of the cognitive motivation itself (Table 2).

Table 2. Diagnostic methods of criteria for the formation of the cognitive motivation in junior school age children in SEI

Num.	Criteria	Diagnostic methods
1.	Cognitive need	The Cognitive need approach proposed by V.S. Yurkevich (Ilyin, 2003).
2.	Cognitive interest	The Unfinished sentences approachproposed by G. I. Schukina (Shchukin, 1971).
3.	Prevailing motive	The Stepway of incentives approach by N.V. Elfimova (Elfimova, 2003).
4.	Personal significance	The Thermometer scale approach by N.V. Elfimova (Elfimova, 2003).
5.	Prevailing activity nature	The free choice of tasks approach, developed based of the envelopes technique by G.I. Shchukina (Shchukina 1971).
6.	Intellectual activity	Our questionnaire for teachers and parents, observation of students, the Ask questions, Choose a task techniques.
7.	Emotions	The technique we proposed meant that children had to +(plus)-mark the emotions and feelings they felt while performing various tasks. We used the data from the children's My Mood and My Success diaries.
8.	Reflection	We developed a questionnaire, which we asked our students to fill out once they had finished a task (or at the end of a half year period), we had conversations with parents, from which we learned about the children's reaction to their own successes or failures.

3. Results and discussion

The sample consisted of 8-9 year-old children, attending the Ulybka (Smile) and Mashen'ka children's developing studios in Kirov, Russia. All students (60 8-9 year-old children) were divided into two groups according to the ascertaining experiment data. Each of the groups had the optimally equivalent quantitative and qualitative composition of students: there were 30 students in the experimental group and 30 students in the control group.

In the course of the formative experiment, in the experimental group, the suggested pedagogical conditions for the cognitive motivation formation in junior school age children were implemented, while the control group was taught without these conditions. To ensure the identity of the experiment conditions, one and the same teacher conducted classes throughout the complete term of the experiment.

The evaluation results of the cognitive motivation formation junior school age children are presented in tables (Tables 1–4) and figures (Figures 1, 2). The tabulated values are given as a percentage.

Table 3. The dynamics of the cognitive motivation formation in the control group

	At the beginning of the experiment					At the end of the experiment				
Levels Criteria	1	2	3	4	5	1	2	3	4	5
Cognitive need	10	17	37	30	6	6	20	40	28	6
Cognitive interest	17	27	20	30	6	10	23	20	37	10

Prevailing activity motive	13	30	33	24	0	13	30	27	27	3
Personal significance	6	10	14	60	10	3	14	20	53	10
Prevailing nature of activity	20	17	43	20	0	17	23	46	14	0
Intellectual activity	10	23	47	17	3	0	27	53	14	6
Emotions	17	13	23	34	13	13	24	30	30	6
Reflexive skills	24	27	40	6	3	17	24	46	10	3

Table 4. The dynamics of the cognitive motivation formation in the experimental group

	At the beginning of the experiment					**At the end of the experiment**				
Levels Criteria	1	2	3	4	5	1	2	3	4	5
Cognitive need	6	27	37	27	3	0	13	17	60	10
Cognitive interest	20	24	33	13	10	6	10	17	50	17
Prevailing activity motive	17	37	23	20	3	10	6	20	54	10
Personal significance	10	6	24	54	6	0	10	13	64	13
Prevailing nature of activity	17	13	40	27	3	10	17	20	47	6
Intellectual activity	13	27	40	20	0	3	23	27	37	10
Emotions	20	13	30	20	17	7	10	43	17	23
Reflexive skills	27	24	30	13	6	6	10	20	54	10

Table 5. Dynamics of cognitive motivation in the control and experimental group

Levels	**The beginning of the experiment, control group**	**The end of the experiment, control group**	**The beginning of the experiment, experimental group**	**The end of the experiment, experimental group**
1	0	0	6	0
2	17	13	23	6
3	60	57	41	37
4	23	27	27	47
5	0	3	3	10

If we consider the generalized results of the experiment, then in the control group there were 17 % of level 2 students, 60 % – level 3, and 23 % – level 4. At the end of the experiment, the number of students of level 2 and level 3 decreased by 4 % and 3 %, respectively. The number of students of levels 4 and 5 of cognitive motivation increased by 4 % and 3 %.

In the experimental group at the beginning of the experiment there were 6 % of level 1 students, 23 % – level 2, 41 % – level 3, 27 % – level 4, and 3 % of level 5. At the end of the experiment, the values for levels 4 and 5 increased by 20 % and 7 %. There were no more students of level 1 of cognitive motivation, the decrease was noted for levels 2 and 3 by 17 % and 4 %.

General analysis values of growth and decline trends at various levels makes it possible to draw certain conclusions about the dynamics of cognitive motivation. In the control group, changes toward improvement were insignificant and unsustained; in the experimental group, on the contrary, 4 out of 8 values showed growth at levels 4 and 5, 1 value displayed growth at levels 3, 4 and 5, 2 values were noted to grow at levels 2, 4 and 5, and 1 value demonstrated growth at levels 3 and 5. This fact supports the idea of the uniformity and regularity of the process of the cognitive motivation formation in junior school age children in the experimental group.

These findings are confirmed by linear diagrams, which show the nature of the dynamics of the phenomenon under study (Figure 1, Figure 2). The linear diagrams show that the cognitive motivation demonstrated the most rapid development in the experimental group.

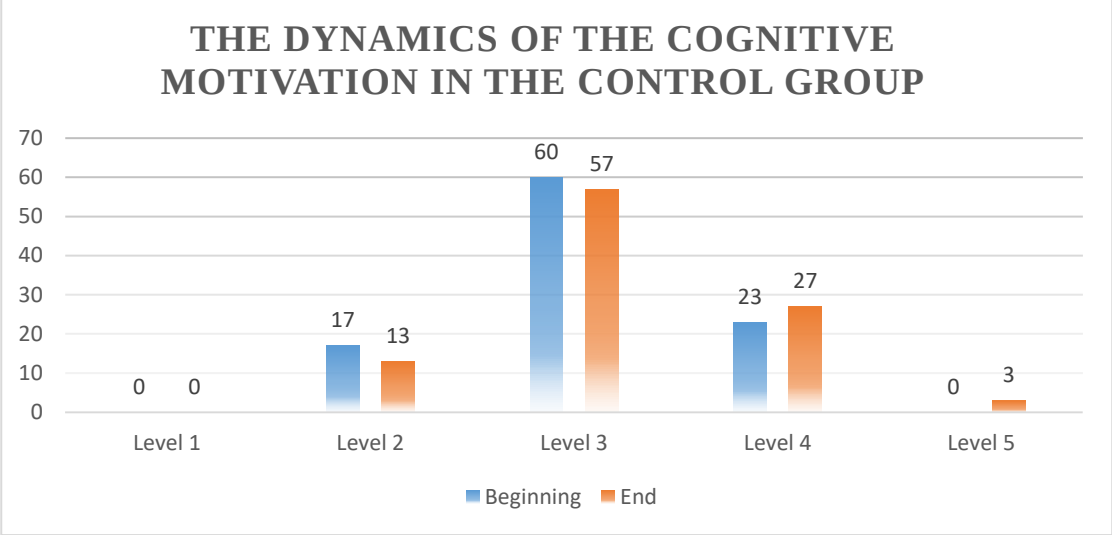

Fig. 1. The dynamics of cognitive motivation in the control group

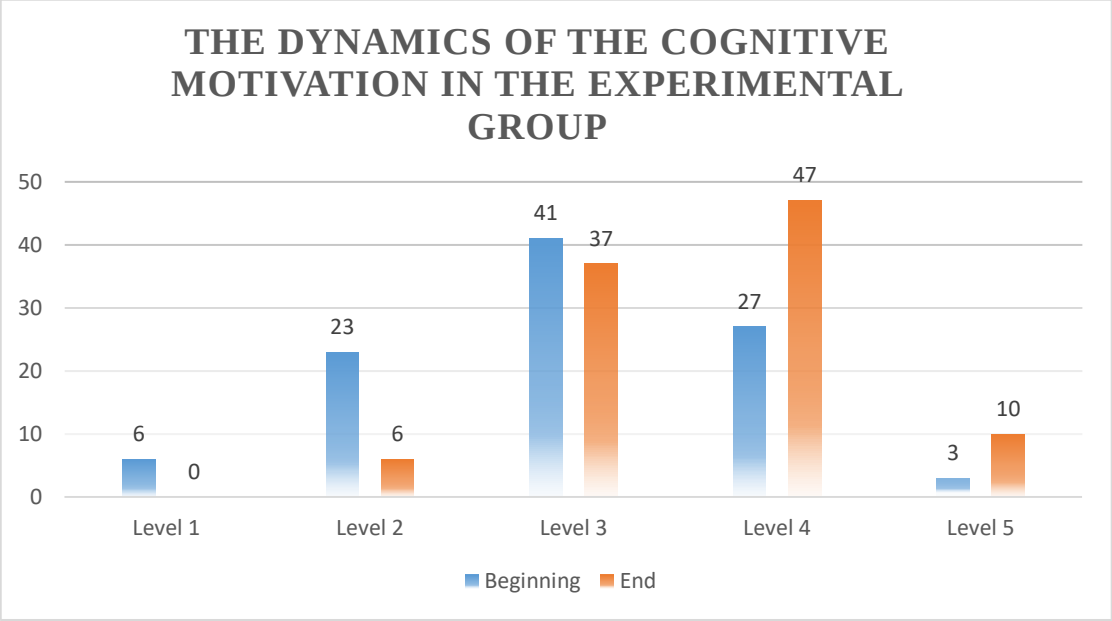

Fig. 2. The dynamics of cognitive motivation in the experimental group

To test the accuracy of the experimental data, let us compare the G-values (Ermolaev, 2003).

Table 6. Number of shifts in the control group

Number of shifts in the group	**Scale**								**Total**
	1	2	3	4	5	6	7	8	
Positive	2	10	7	5	5	8	3	7	47
Negative	2	1	4	6	7	2	9	1	32
Null	26	19	19	19	18	20	18	22	161
Total of non-null shifts (n)	4	11	11	11	12	10	12	8	79

Table 7. Number of shifts in the experimental group

Number of shifts in the group	**Scale**								**Total**
	1	2	3	4	5	6	7	8	
Positive	22	23	19	11	8	15	11	21	130
Negative	0	0	0	0	0	0	0	0	0
Null	8	7	11	19	22	15	19	9	110
Total of non-null shifts (n)	22	23	19	11	8	15	11	21	130

Let us formulate a hypothesis for the experimental group:

H_o: A shift toward improvement in the cognitive motivation is random.

H_1: A shift toward improvement in the cognitive motivation is nonrandom.

The sum total of eight scales is n = 130; the typical shift is positive; there are no negative shifts, i.e. G_{emp}= 0; the critical statistical value is taken from statistical tables:

$$G_{cr} = \begin{cases} 55, at\ p = 0.05 \\ 51, at\ p = 0.01 \end{cases},$$

Insofar as $G_{emp}<G_{cr}$ then hypothesis $H_o$leans toward an alternative hypothesis H_1i.e. the shift toward improvement of the cognitive motivation values, based on the scales total can be considered nonrandom.

It can be concluded that the shift towards improvement of cognitive motivation values after the experiment is nonrandom for each scale, the probability of it being so is 95 % and 99 % by the sum total of eight scales.

Let us formulate hypotheses for the control group.

H_o: A shift toward improvement in the cognitive motivation is random**.**

H_1: A shift toward improvement in the cognitive motivation is nonrandom.

The sum total of eight scales is n = 79; the typical shift is positive; there are 32 negative shifts, i.e. G_{emp}= 32; the critical statistical value is taken from statistical tables:

$$G_{cr} = \begin{cases} 31, at\ p = 0.05 \\ 28, at\ p = 0.01 \end{cases},$$

Insofar as $G_{emp}>G_{cr}$ then hypothesis H_o is accepted, i.e. the shift toward improvement of the cognitive motivation values, based on the scales total can be considered random.

It can be concluded that the shift towards improvement of cognitive motivation values in the control group is random for practically all scales, the probability of it being so is 95 % and 99 % by the sum total of eight scales.

Since no significant changes occurred in the control group, while there was registered a pronounced positive shift in the experimental group, it can be stated that the differences in the degree of the positive shift in the control and experimental groups are trustworthy.

However, it should be noted that although there has been found a pronounced positive shift on all scales, there have also been registered null shifts (Table 8):

Table 8. Number of null shifts

Scale	1	2	3	4	5	6	7	8	total
% of null shifts	26.7	23.3	36.7	30.0	73.3	50.0	63.3	30.0	45.8

This means that for a certain part of the subjects no changes have occurred.

Moreover, there are no negative shifts on any of the scales, i.e. the experiment has had no negative effect. The confidence level about the results and conclusions reaches 95 % and even 99 %.

Thus, we can conclude about the appropriateness of using the proposed pedagogical conditions for the formation of cognitive motivation in junior school age children at supplementary education, since the data obtained from the final experiment and their statistical processing demonstrate, that the level of cognitive motivation among junior school age children of the experimental group has increased during the formative experiment.

4. Conclusion

The study has formulated and implemented pedagogical conditions for the cognitive motivation formation in junior school age children in institutions of supplementary education. The implementation of these conditions is based on equal relations and equally active participation of children, their parents and the pedagogue. It includes three interrelated and interdependent stages: motivational-stimulating, substantive and reflexive-evaluative one. The implementation of conditions is aimed at shaping the cognitive need and interest, wide cognitive motives, children's awareness of learning a foreign language for themselves personally, organizing creative and productive activities, forming intellectual activity, filling the children with positive emotions, developing their ability to self-analyze, and nurturing their self-respect.

The experiment results the trustworthiness of the positive dynamics of the cognitive motivation formation in junior school age children of the experimental groups and make it possible for us to track changes in the degrees of the children's cognitive motivation formation within the period of the formative experiment.

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