Investigating Cognitive Processes and Language Mastering of Rural and Urban School Children

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Abstract

This research examines the formation of cognitive processes and mastering a trinity of languages (Kazakh, Russian and English) by both rural and urban primary school pupils. This work's aim is to form a complex system of psychological studies of compulsory education, which cover theoretical methodological base knowledge. In other words, it is important to specify solutions to specific problems in the real world.

Keywords: *methodological research, integrated process, cognitive development, primary school children, language learning*

1. Introduction

In this research, the cognitive processes and levels of mastering Kazakh, Russian and English of both urban and rural pre- and primary school children are researched from scientific and psychological viewpoints for the first time. This research aims to develop existing fundamental and applied psychological knowledge systems by examining present cognitive processes in education and science. The research fully covers cognitive psychology theory. The types and characteristics of cognitive processes are structured on the integrity principle. An experimental and methodological system is designed to diagnose the step-by-step development range through applied practice and to resolve children's development issues. The methods presented in the following sections are innovatively directed to enhance actions while mastering the session and languages through personal cognitive development.

The topicality of the research arises from the necessity to further enhance educational processes, which was the result of decreasing psycho-cognitive actions in children in connection with objective and subjective appearances in preschool organizations and schools. The theoretical basis of cognitive process psychology has not been fully investigated until now; particularly, experimental research has not addressed practical application. In addition, many issues still remain unresolved. Therefore, issues of cognitive actions and their solutions remain urgent in the science of psychology. One of the main peculiarities of pedagogical psychology is its dual aim of developing individual personal abilities and usefully serving the entire population.

The main goal is to systemize knowledge that contains the basics of theoretical and methodological psychological research and use it to solve real-world problems. A major requirement in the Kazakh educational system is directing cognitive actions to a pupil while teaching, and basing instruction on proven research is a priority. This research's topicality arises from the need to discover mechanisms that can raise cognitive processes to the required level.

The topicality of the research work is fixed by following: experimental definition of the principle that the effectiveness of children's formation and development of cognitional processes depends directly on their mastering of class content. Furthermore, the applied directions for cognitional processes arise from the daily needs of different specialists, e.g. psychologists, teachers, doctors, lawyers, technical system operators and care givers.

The research's methodological essence can be described as follows: theories and concepts from scientific articles

concerning research work that required building a structured system from the historical viewpoint. Complex systematic direction should have actual application in contemporary psychology and pedagogy to investigate the cognitive processes for the first time. Researchers must analyze historical data on cognition issues and create a complex structure. In the context of individual teaching of a child, the implementation of complex systems and action relations enables conducting research and developing, understanding and mastering the theoretical and experimental range on a methodological base.

In accordance with current requirements, the overall aim is to raise the level of knowledge in preschools and schools as much as possible by conducting a new type of research through the application of Kazakh national traditions guided by proven theories and rules.

2. Materials and Methods

For defining the methodological basis for research on preschool children's cognitive processes, the following previous research studies were referred to. Kerna-Yesseck's research on registering the readiness degrees of preschool children; D. Vecksler's scale to identify a child's intellectual level; E.P. Torrens's (Bruner, 1971) test to develop children's thinking and creativity levels; S.R. Raven's progressive matrix used to measure the intellectual development level; L.A. Venger's "animated tasks" designed to develop children's thinking skills; the practical results of cognitive processes' foundation and experimental research; the concept of step-by-step development of a child's mental activities, as proven by P.Y. Galperin; the paradigms of experimental research by V.V. Davydov, M.V. Gamezo and I.A. Domashenko; the historical and cultural concepts of L.S. Vygodskiy. Also consulted were data from the starting methodologies of the following authors researching dynamic changes in student progress: A.V. Zaporozhets, D.V. Elkonin (1974), A.K. Markova, N.F. Talyzina, L.Y. Liaudis, Z.A. Reshetova and L.V. Zankov. To identify the peculiarities of cognitive-action foundations, the substantial and effective ideas of Leontev, Wengler (1986), Galperin, Podyakov as well as Kazakhstani psychologists such as M. Mukanov and S.M. Zhakupov were analyzed.

Analyzing cognitive processes with such an integrated system demonstrates the methodological essence of research from the perspective of modern psychology.

The research's theoretical topicality emerges mainly from three classical directions: cognitive psychology, action psychology and mental psychology. To these are added analysis from the following theoretical and experimental perspectives: the historical and cultural concepts of L.S. Vygodskiy, who considered the problems of cognitive processes in a general theoretical direction; S.L. Rubinstein's study of regulation of thinking processes: analysis, synthesis and abstraction; representatives of cognitive psychology: K. Cherry, D. Broadbent, L. Selso and U. Niesser; types and characteristics of cognitive processes from the works of J. Bruner, R. Woodworth, D. Heb and V. Ettinev and those of English psychologists M. Vernon, O Sangwin and R. Alfield; processes of spiritual life by Vygodskiy; mental psychology by I.P. Pavlov; reflexes of the brain by I.M. Sechenov; intellect and independent intellect by P.K. Anokhin and A. G. Spirkin; and Rubinstein and Leontev's concepts on action relationships. All of these are works that investigated the individual features of children and researched pedagogical tasks.

First, L.S. Vygodskiy, who thoroughly studied people's inward life, mainly conceptualized the "cultural-historical development of the human psyche" and the "forthcoming development area of child's psyche". Experimental research on perception shows that all ideas based on the association law are pertaining to the mental process, and they are substantiated by the mind function. In association theory, perception of such ideas is also considered as the totality of sensation. In this case, V. Keler, G. Folkelt and K. Gottshald, in their research on structural psychology, have a critical attitude toward ideas of child perception and a negative attitude toward the idea that "general perception consists of the totality of incoherent and scattered fractions". Instead, they support the opinion that perceptual development involves an unbroken image of things. This opinion is also supported by the research work of G. Roshakh, I.E. Bleiler and A. Bineler.

Second, in historically examining the main theoretical viewpoint of thinking psychology, L.S. Vygodskiy mentioned the importance of J. Piaget's theory that the interaction of biological and social factors greatly influences the development of thinking. P.Y.A. Galperin's theory that the mind's functions develop step-by-step also has great significance. According to Piaget (1978), speaking serves as socialization of thought, helping the child to communicate with others. V. Shtern argues that although a child's first word may be only one noun, an entire statement lies behind that one spoken word.

In analyzing the fundamental problem of how children's thinking abilities develop, scientists have paid special attention to the substance of individual children's speech, studying it in relation to the child's actions.

Third, T. Ribo mentioned two types of dreams in his study of dreams: "revival" and "creative". The earliest opinions that the creative dream consists of fractions were expressed by W. Wundt (1987) and T. Ribo. In a psychoanalytical doctrine, Z. Freud (1990) supports the idea that a dream is the initial type of consciousness for children and that other human consciousness appeared on the basis of it. Other sources also confirm the interconnection between dreams and

thinking. Dreams play an important role in the development of cognition and help form a special connection between consciousness and the truth.

3. Results and Discussion

Currently, thinking and speaking processes are a topical issue of investigation because sensation, perception and representation are not sufficient to completely understand outward life. Understanding thinking action is fulfilled by basic regularities in primary classes: children perceive everything figuratively and "solve" every task by imagining it. The difference between visual images and logical thinking enables children to distinguish different things in different situations and discover the right solution for different tasks. Knowledge imparted in primary school certainly shapes the mental and intellectual abilities of children, but it also relates to issues of psychological development. Many scientists have mentioned the effect of cognition in the areas of ethics and worldview; this effect is also expounded in this work.

Practical topicality of the research, i.e. a complex organic result derived through research can help psychologists and pedagogues to introduce special teaching processes into an academic program. This complex organic result can also enrich the knowledge of future pedagogical specialists about the psychology of cognitive processes. Students and postgraduates can use these research results in their pedagogical practice; specialists in the psychological sphere may also use them for scientific guidance.

This research aims for a complex investigation of the shaping of cognitive processes and the dynamics of development mechanisms for thinking and speaking on the national level on the basis of the psychological theory underlying the learning of three languages (Kazakh, Russian and English). More specifically, this research aims to develop a method for shaping cognitive processes and language learning among pre- and primary school children.

The research subject is the program for shaping cognitive processes and language learning among pre- and primary school children by forming and developing national thinking and speaking ability in three languages.

Aims and tasks of the research:

1. To teach children considering today's scientific conclusions about cognition in psychology, and at the same time, conduct a theoretical examination of Kazakh and other nations' research on the development of pre- and primary school children's cognition.
2. To investigate application opportunities of cognitive processes by revealing the theoretical– methodological meaning of national thinking, speaking developments and language mastering; to appraise rational organizational methods of action process based on the formation of cognitive processes.
3. To develop a pedagogical approach and teaching methods for primary school children by considering national thinking and the psychological dynamics of the development of speaking.
4. To determine the difficulties that occur during formation and development of cognitive processes and to research approaches for counteracting them; to form a complex research system by analyzing the methods of cognitive process research.

In the present research's novel methodological approach, cognitive process theories were analysed as a complex system for the first time. In addition, opportunities of integration– methodological development based on fundamental applied education in cognition psychology in Kazakhstan were studied and realized.

Also for the first time, the national thinking and speech development of pre- and primary school children were analysed in both urban and rural areas. This provided opportunities for constructing a national model of thinking and speech development in Kazakh children according to today's achievements in psychology and spoken-language learning based on integration–methodological research and determination.

Second, the chart emerged through researching the subject. Research on national language mastering through speaking and thinking in Kazakh among urban Kazakh schools was conducted according to the teaching–methodological system.

Third, for the first time, cognitive theory, which forms cognitive actions in the educational process, paid particular attention to national thinking and speaking. The development of spoken language provides conditions for the following research according to modified experimental method content:

- The organization of direction for individual action possibilities of a person being tested is realized through diagnostics of the development level of national thinking and speaking in cognitive processes.
- Study of cognitive processes and cognitive actions on the basis of integration methods was conducted for the first time in psychology.
- The exact opportunities of national thinking and speaking, especially the operations of analysis, synthesis and abstraction, content and style were studied as important features of speaking.

- Regulation of a schoolchild's action capability level was used for the first time by the individual experimental methodological determination of features of cognition actions.
- Finally, whether children's learning of three languages makes it easy to learn other languages and speaking well in the first language were studied through experimental methods during the formation of cognitional processes.

4. Conclusions

Initial studies of psychological mechanisms through the education process of forming cognitive processes and revising the previous system in relation to the importance of certain factors in children's formation made it possible to develop applied education.

Through theoretical analysis, the research aims from the beginning of study and the description of progress in school studies (highest, medium, lowest) were revised according to today's psychological findings.

Again, for the first time, a contribution to the cognitive process of national thinking and speaking was made through an integration method.

Schools' educational process was realized by limiting interference. The development of cognitive processes was realized by revealing the structural meaning of the task by considering opportunities to help teachers and by elucidating the psychological mechanisms.

The novelty of this research's theme is the formation and development of cognitive processes. The methods defining the learning level were analysed, chosen and modified. Through experimental research, the statistical and numerical measures were analysed and developed. The development of thinking and speaking, learning of spoken languages and learning the other languages (Russian and English) were tested according to learning aims.

According to the sequence and reliability of the research, the forms of research and the theoretical, methodological integrity forms of the complex system, the research was validated in the following ways: by using a methodological complex, by checking the reliability of information and data from the experimental research and by comparing mathematical statistical data (comparison of practical and theoretical divisions, two empirical divisions, the U-Manna-Whitney criteria and the criteria of H-Kruskala-Wallis, and also the definer of conformity level, that is, the Gs-Spirman coefficient of correlation level).

All of the following were realized, while analysis of the pedagogical experience continues: Research methods; psychological, pedagogical, scientific-methodological materials; *analysis of the complex system* of scientific data about cognitive processes; the forms of research and the models of analysis; experimental–diagnostic method: "groups of Methods for Research"; and observing and speaking methods (Assilkhanova, 2000).

The following research objectives must be addressed in future work:

1. Organize and establish the theoretical–methodological direction of research work on the basis of psychological and psychophysiological theories of cognitive processes.
2. The determination of the psychological development of cognition and the importance of the educational process between fluent speaking in the first language and thinking according to today's scientific requirements—all serve to form a new system.
3. Research on the systematic development of cognitive processes and cognitive actions is realized on the basis of maintaining the systematic principle of the integration–methodological complex.
4. The practical importance of research applications while conducting research about the formation of learning the first language in preschool and primary school realized in Kazakh schools and kindergartens through a special diagnostic method.
5. Experimental research on cognitive processes using modification methods to develop teaching strategies for children can be realized as follows:
   - Preparation by considering the individual features of the educational program content.
   - Development of individual features step-by-step.
   - Organization of the didactic-communicative system according to its features.
6. Pre- and primary school children demonstrated positive results in the formation of national thinking, speaking and cognitive processes.

In conclusion, any difficulties in a child's development arise as a result of the educational process in early childhood.

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