Խ.ԱԲՈՎՅԱՆԻ ԱՆՎԱՆ ՀԱՅԿԱԿԱՆ ՊԵՏԱԿԱՆ ՄԱՆԿԱՎԱՐԺԱԿԱՆ ՀԱՄԱԼՍԱՐԱՆԻ ԳԻՏԱԿԱՆ ՏԵՂԵԿԱԳԻՐ УЧЕНЫЕ ЗАПИСКИ АРМЯНСКОГО ГОСУДАРСТВЕННОГО ПЕДАГОГИЧЕСКОГО УНИВЕРСИТЕТА ИМ. Х. АБОВЯНА

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INTERCONNECTION BETWEEN SENIOR PRESCHOOLER'S PRIOR KNOWLEDGE ON CHESS AND DIVERGENT THINKING AMIRAGHYAN M. G. Armenian State Pedagogical University After Khachatur Abovyan e-mail: amiraghyan.80@mail.ru

ABSTRACT

The article discusses the issue of proper organization of children's developmental process during learning, when understanding of the presented material, its reconstruction practical application becomes important. From this, children's prior knowledge play an important role, which is also essential in perceiving chess. In the article, on the one hand, we referred to the methodology of the formation of senior preschoolers' (5-6 years old) prior knowledge on chess, emphasizing its investment in the whole pedagogical process of preschool educational institutions (lessons on preschool educational methodologies, games, various work with children, electronic game-tasks), on the other hand, the impact of chess prior knowledge on children's development process, where the transition from the "zone of actual into proximal development" is essential in the acquisition of knowledge, abilities, skills, a new level of development. In this context prior knowledge is connected with the components of intellect.

However, it should be noted that less attention is paid to the importance of children's prior knowledge in kindergartens, while the latter has a significant impact on preschoolers' development process promoting the formation of divergent (alternative) thinking, which is included in the structure of intelect suggested by J. Guilford. In addition, prior knowledge on chess acquired at senior preschool age is a solid basis for properly mastering Chess at school, which is a compulsory subject for primary classes in Armenia.

The aim of the research is to reveal the impact of chess prior knowledge on senior preschoolers' development and prove the interconnection of the latter with divergent thinking.

The effectiveness of our research has been revealed through Williams's diagnostic methodology. The gained results are presented in a three-dimensional model at low, average and high levels.

Key words: prior knowledge, preschool educational methodologies, zones of "actual" and "proximal" development, divergent thinking, structure of intellect.

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INTRODUCTION

The 2004 Concept for the Development of Preschool Education in the Republic of Armenia emphasizes the role of education in the comprehensive development of a child. This means that the educational system should be aimed at the proper organization of the development process. Hence, the initial objective of preschool education is to promote preschoolers' development, teach them to think and find effective solutions to problem situations. Therefore, the content of education organized in preschool educational institutions, the ways of organizing work with children, the chosen methods, means should be aimed at the effective organization of preschoolers' development process.

In order to provide children's development in education it's important to take into account the theory of zones of "actual" and "proximal" development suggested by L. S. Vygotsky.

The zone of proximal development (ZPD) is defined as an overarching concept that integrates the main tenets of Vygotsky's theory of human development. This zone refers to the range of abilities an individual can perform with the guidance of a teacher, but cannot yet perform on their own. When children are close to mastering a skill set required to complete a task, but still need the guidance of a teacher to do so, they are considered to be in their zone of proximal development. It is the distance between a child's actual and possible development. When children are able to solve a problem on their own, without the help of an adult, it indicates the zone of actual development. The possible development is when the child is able to learn, to master the presented material [1, p. 78].

There are three stages of ZPD: a)when a child can't accomplish the task even with assistance, b)when a child can accomplish the task with assistance, c)when a child accomplish the task without assistance.

This means that for ZPD to take place it's important to take into account a child's initial notions on represented material, base on it pushing the development process forward, find a child's next ZPD and encourage further learning. Hence, the acquisition of new abilities occurs in the zone of proximal development where children's prior knowledge in the process of development gets importance.

It should also be noted that L.S. Vygotsky's theory is quite general. In order to achieve the ZPD the direction of a child's development should be clarified.

It's known that there are mainly four areas of development: social, cognitive, emotional and behavioral. In our research, we emphasized the cognitive development through formation of prior knowledge on chess, which is formed on the basis of visualization. The latter is the main factor in chess learning. From this, there is a need to find out the essence of prior knowledge.

According to Armenian explanatory dictionaries 'prior knowledge is considered as: elementary information, initial knowledge of a discipline, skill, necessary information for studying the main subject. The synonyms to 'prior knowledge' are: "principle", "element", "initial awareness" [2].

The term of 'prior knowledge' is widely used in a number of psychological theories:

1) **constructivism**, when it is stated that knowledge arises as a result of activating what is already known, in the process of its reconstruction by learners, when they integrate it in their present experiences and perceptions of the reality,

2)**cognitive theory**, according to which learners actively connect new information to what they already know []3, p. 52[].

Therefore, prior knowledge is an integral part of learning. During presenting a new material, children's initial ideas play an essential role in the organization of learning process as prior knowledge organizes, integrates new information, making it sensible.

Prior knowledge also has a positive effect on the process of solving cognitive problems. It is a powerful factor in mastering the subject. Consequently, the lack of prior knowledge makes the learning process complicated, the low level of children's prior knowledge makes it much more difficult to master a new material. Trying to learn something without having a preconceived notion can lead to a rote memorization of the material, in the result of which a child is unable to make connections between new material and previously acquired notions. Prior knowledge is hierarchical, dynamic in nature. In this context, in the structure of prior knowledge, declarative and procedural knowledge is distinguished. Each of them is characterized by corresponding criteria and processes. Declarative knowledge provides a low level of knowledge, which implies knowledge of facts when a child simply remembers, enumerates or reproduces it. This component provides knowledge about a phenomenon, it implies the mechanical mastery of facts, without ensuring the integration of knowledge. Procedural knowledge allows to integrate knowledge, perceive the connections among phenomena, classify, compare objects, apply knowledge for problem-solving. It is referred as "knowing how" and is closely related to cognitive abilities [4, p. 48].

Comparing these two types of knowledge we can say that declarative knowledge just provides awareness and procedural knowledge provides the perception of the presented material and application of the acquired knowledge. Therefore, in the formation of prior knowledge it is essential to pay attention to this factor and not to promote to mechanically reproduction of the presented material by a child but to stimulate the integration previously perceived notions with a new material, which is essential in problem-solving process.

In connection with the above, we emphasize the formation of senior preschoolers' prior knowledge on chess which leads a child:

1) to reconstruct prior knowledge all the time, when a new material is presented,

2) to implement that differently trying to find alternative solutions to a task,

3) to gain knowledge visually, imagine the changes of positions of chess pieces on the chessboard.

Therefore, prior knowledge is connected with three dimensions of the intellect (See Figure 2 – The structure of intellect by J. P. Guilford).



Figure 2 The structure of the intellect

As it is seen from Figure 2, in the structure of intellect J. P. Guilford separated three dimensions: operations, contents and products with their components.

The Operation dimension includes five intellectual processes (operations), of which prior knowledge is connected with divergent production (thinking), when a child generates multiple solutions trying to solve a problem creatively. Divergent thinking is described with its creativity, originality. It gives a child an opportunity to test different solutions to a task and find a creative one [5, p. 67].

The Contents dimension includes five areas of information to which human intellect applies operations. Of these, prior knowledge is connected with visual component.

The Product dimension contains results of applying particular operations to specific contents. Of these areas prior knowledge is connected with transformation which supposes changes, perspectives, conversions, mutations to knowledge [6, p. 27].

Preschoolers' prior knowledge is formed visually, it is used in alternative way by a child providing its reconstruction and transformation, which leads to the achievement of ZPD, where not only the role of an adult but the whole pedagogical process in kindergarten (the content of work, methods, means and ways) become urgent.

METHODOLOGY

In the preschool institutions of the Republic of Armenia lessons, various works on preschool methodologies are organized (Speech development, Formation of elementary mathematical notions, Fine arts, Ecological education, Physical education), which form initial notions in children, as a result of which the content of relevant subjects is more easily mastered at school. In case of forming prior knowledge on chess, in elementary grades , "Chess" will easily be mastered by children, too.

However, in forming senior preschoolers' prior knowledge on chess we do not aim to present chess as a separate subject to children, but rather to invest chess prior knowledge in the entire pedagogical process of preschool educational institutions.

We'd like to mention, that such an approach is a result of the work carried out by the lecturers of the chair of Preschool pedagogy and methodology in ASPU.



Our approach is more evidently presented in Figure 3 .

Figure 3. The content of the work aimed at forming prior knowledge on chess

It is obvious that the process of developing senior preschoolers' chess prior knowledge has been carried out on the principle of integration, when the pedagogical approaches, forms, methods are introduced in the content of preschool methodologies, as well as in pedagogical practices (organized for students in kindergartens), modern pedagogical technologies, organization of additional education (English teaching), in electronic game-tasks and materials.

The following principles in the formation of prior knowledge on chess have been worked out:

- entirety, interconnection of the pedagogical process of the kindergarten,
- availability, sequence, coordination of the formation of prior knowledge on chess,
- encouraging children's activity in acquiring chess prior knowledge,
- providing children's interest, their involvement in the work and active participation in it.

Basing on the principles the objectives have been driven out:

- developing children's interest to chess,
- introduction of the chessboard, its structure,
- presentation of chess pieces, their movements, the role of each piece in the game,
- formation of the ability to move the chess pieces freely on the board,
- development of skills to solve chess tasks trying to find alternative solutions to them.

The mentioned objectives were solved by presenting the worked out material in the following sequence:

• formation of prior knowledge on the chessboard (the structure of the board, directions),

• formation of prior knowledge on chess pieces (names of pieces, their movements, meaning and role of each),

• free movement of chess pieces on the board (problem solving tasks).

The outcomes of our work have also been worked out: a) the child thinks while moving the pieces on the chessboard, b) carefully follows friend's steps and evaluates them, c) orients in moves of chess pieces, plans the next move, d) justify the necessity of the move done by him/her in problem-solving situations, e) finds alternative solutions to gain the goal.

During the organization of the work, we took into account children's initial notions on preschool methodologies, for example, Elementary mathematics (numbers, squares, angle, edge, center, spatial concepts: right, left, backward, forward), Speech development (king, queen, white, black, row, column). At the age of 5-6 children already have above-mentioned initial notions.

Such an approach not only leads to master chess but solve the objectives of the preschool methodologies as well.

Let's comment on the above with the examples of Speech development methodology and Elementary Mathematics.

During Speech development lessons children name chess pieces, separates the first and last sounds of their names, make new words with those sounds, find and describe the missing

chess piece on the chessboard using synonyms, antonyms, make sentences, learn small poems, make situations or short stories about the pieces (eg. 'Why the knight changes the colour of squares all the time ...?, What will happen if the pawns move backward...?), guess riddles, tell fairy tales, give questions to each other about chess, estimate peers' answers, complete unfinished stories etc.

It's obvious that by introducing a material with chess content in Speech development methodology, at the same time it is possible to solve the objectives of the latter and form children's prior knowledge on chess.

During lessons on Mathematics children not only maintain their notions on cardinal, ordinal numbers, spatial notions, geometric figures through chessboard, adding and subtraction through the points of each chess pieces but also solve problem tasks (eg. How many geographical figures can you find on the chess board? How many possible ways does the Queen have to gather all the flowers?, What piece will the white Bishop take? - See Figure 4).





This kind of tasks, on the one hand, help children to perceive chess board, chess pieces, their moves, on the other hand, find different ways for solving the tasks.

In other preschool methodologies we also invested such situations, which allow the child to think and find alternative solutions.

DISCUSSION

The effectiveness of the research has been revealed by William's diagnostic methodology. It consists of 12 different images that children should complete and name. The diagnostic methodology reveals the level of the following five components, which estimate children's divergent thinking: smoothness, flexibility, originality, elaboration, giving a name.

The choice of Williams's methodology is conditioned by the fact that prior knowledge, as we mentioned above, is connected with divergent thinking.

The experiments were carried out in three kindergartens. On the whole, 60 senior preschoolers took part in the experiment.

According to the final results, 38 (63%) children manifested high level, 16 (27%) average and 6 children (10%) low level.

We must also note that before organizing the work with children the initial data were as the following:

20 (33%) children manifested high level, 25 (42%) children-average, 15 (25%) children low level.



The data are presented in Chart 1.



As it is seen from Chart 1 after the work conducted with children there is an increase in high level and reduction in average and low levels.

The obtained results justify the effectiveness of our approaches of developing senior preschoolers' prior knowledge on chess providing transition from zones of actual development into proximal

We'd like to mention some risks in the initial stage of the research. On the one hand, they were connected with the insufficient chess knowledge of kindergarten teachers, on the other hand, with the concern to involve the children in the process. The mentioned risks were gradually reduced, as systematic work was carried out with the kindergarten teachers (Chess training). As for the children, they gradually involved in the process, showing a positive attitude, especially to the lessons with chess prior knowledge content.

CONCLUSION

The results of our theoretical and experimental work have proved:

- the effectiveness of our approach to the formation of prior knowledge on chess when the latter is included in the whole process of preschool educational institutions, in various activities organized with children, which continuously strengthens children's chess notions by using different forms and methods.
- interconnection of prior knowledge on chess and divergent thinking,
- senior preschoolers' prior knowledge on chess, which, in fact, is connected with divergent thinking, provides the transition from the zones of 'actual' into 'proximal' development,
- such an approach increases the level of preschool education and reveals new opportunities of development in children.

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ԱՄՓՈՓՈւՄ

ԱՎԱԳ ՆԱԽԱԴՊՐՈՑԱԿԱՆԻ ՇԱԽՄԱՏԱՑԻՆ ՆԱԽԱԳԻՏԵԼԻՔԻ ԵՎ ԴԻՎԵՐԳԵՆՏ ՄՏԱԾՈՂՈւԹՅԱՆ ՓՈԽՊԱՅՄԱՆԱՎՈՐՎԱԾՈւԹՅՈւՆԸ ԱՄԻՐԱՂՅԱՆ Մ․ Գ․

Հոդվածում քննարկվում է ուսումնադաստիարակչական գործընթացում նախադպրոցական տարիքի երեխաների զարգացման կազմակերպման հարցը, որտեղ կարևոր գործոն է նախագիտելիքը։ Վերջինս էական է նաև շախմատ խաղը յուրացնելու համար։ Այստեղից էլ, մի կողմից, անդրադարձել ենք ավագ նախադպրոցականների (5-6 տարեկան) շախմատային նախագիտելիքի ձևավորման խնդրին, ընդգծելով դրա ներմուծումը նախադպրոցական ուսումնական հաստատությունների մանկավարժական գործընթացում (տարբեր մեթոդիկաներից կազմակերպվող պարապմունքներ, խաղեր, տարատեսակ աշխատանքներ, էլեկտրոնային խաղ-առաջադրանքներ), մյուս կողմից, շախմատային նախագիտելիքի ազդեցությունը զարգացման գործընթացի վրա՝ ապահովելով անցումն իրական զարգացման գոտուց դեպի մերձական՝ խթանելով երեխայի հնարավոր զարգացումը։

Այնուամենայնիվ, հարկ է նշել, որ մանկապարտեզներում նվազ ուշադրություն է դարձվում երեխաների նախագիտելիքի խնդրին, մինչդեռ վերջինս էական դեր է խաղում նաև դիվերգենտ (այլընտրանքային) մտածողության զարգացման գործում։ Վերջինս ներառվում է Ջ. Գիլֆորդի կողմից առաջադրված ինտելեկտի կառուցվածքի մեջ։ Այստեղից էլ, հետազոտության նպատակն է բացահայտել շախմատային նախագիտելիքի ազդեցությունն ավագ նախադպրոցական տարիքի երեխաների զարգացման վրա և ցույց տալ վերջիններիս փոխկապվածությունը դիվերգենտ մտածողության հետ։

Հետազոտության արդյունավետությունը բացահայտվել է Վիլյամսի կողմից առաջադրած հայտորոշիչ մեթոդիկայի միջոցով։ Ստացված արդյունքները ներկայացված են եռաչափ մոդելով՝ ցածր, միջին և բարձր մակարդակներով։

Հիմնաբառեր․ շախմատային նախագիտելիք, նախադպրոցական կրթության մեթոդիկաներ, «իրական» և «մերձակա» զարգացման գոտիներ, դիվերգենտ մտածողություն, ինտելեկտի կառուցվածք։

РЕЗЮМЕ

АМИРАГЯН М. Г.

ВЗАИМОСВЯЗЬ МЕЖДУ ШАХМАТНЫХ ПРЕДВАРИТЕЛЬНЫХ ЗНАНИЙ И ДИВЕРГЕНТНОГО МЫШЛЕНИЯ СТАРШИХ ДОШКОЛЬНИКОВ

В статье рассматривается вопрос организации развития дошкольников в образовательном процессе, где предварительные знания являются важным фактором. Последнее также необходимо для овладения шахматной игрой. Отсюда, с одной стороны, мы затронули вопрос развития предварительных знаний по шахматам у старших дошкольников (5-6 лет), сделав акцент на их внедрении в педагогический процесс дошкольных образовательных учреждений (занятия, игры, электронные игрызадания), с другой стороны, влияние шахматных предварительных знаний на процесс развития, обеспечивающих переход из зоны «актуального развития» в «ближайшую», стимулируя возможное развитие ребенка.

Однако следует отметить, что в детских садах проблеме предварительных знаний детей уделяется меньше внимания, а последние также играют значительную роль в

развитии дивергентного (альтернативного) мышления. Последний входит в структуру интеллекта предложенной Гилфордом. Таким образом, цель исследования - выявить влияние шахматных предварительных знаний на развитие старших дошкольников и показать их взаимосвязь с дивергентным мышлением.

Эффективность исследования была выявлена с помощью диагностической методики, предложенной Уильямсом. Полученные результаты представлены в трехмерной модели на низком, среднем и высоком уровнях.

Ключевые слова: предварительные знания по шахматам, методик дошкольного обучения, зоны «актуального» и «ближайшего» развития, дивергентное мышление, структура интеллекта.

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