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Oleksandr Shymanskyi
Specialist in Physical Education and Sports, Principal,
Leadership Development Club "LEV", Bila Tserkva, Ukraine
https://orcid.org/0009-0005-2625-6797

COMPARATIVE ASSESSMENT OF THE IMPACT OF ONLINE PLATFORMS AND TRADITIONAL CHESS TEACHING METHODS ON THE LOGICAL-ANALYTICAL THINKING OF PRESCHOOLERS

The article analyzed approaches to the formation of logical-analytical thinking in preschool children. It was found that logical-analytical thinking helps preschool children navigate the world around them, understand cause-and-effect relationships, build elementary models, and solve simple problems. The main theoretical approaches to the development of logical-analytical thinking are characterized. The game approach is especially important in the formation of logical-analytical thinking in preschoolers. Strategic games, in particular chess, contribute to the development of key mental operations. The methodology for introducing preschool children to the basics of chess involves the use of such didactic techniques as an accessible explanation of concepts, the use of metaphors, analogies, and the use of artistic images. The memory and attention of preschool children work mainly without conscious control, which is why bright, emotionally charged events are easier to remember, which emphasizes the importance of digital tools for the figurative representation of information. The most popular online applications that can be used to teach children chess are described. It was found that traditional methods provide a deeper assimilation of the basic principles of the game and contribute to the development of social skills, such as communication and cooperation. At the same time, digital tools allow using interactive platforms to quickly and effectively involve children in learning, improving their motivation and independence in the process of mastering the game. A comparison of the effectiveness of online platforms and traditional methods in developing logical thinking has shown that both approaches have their advantages and limitations. In this regard, combined chess training, which includes both online tools and traditional methods, is the most effective approach for developing logical-analytical thinking in preschool children, as it allows integrating the best aspects of both approaches and provides an individualized approach to each child.

Keywords: *preschool education, digital tools, game approach, online platforms.*

Шиманський О. О. Порівняльна оцінка впливу онлайн-платформ і традиційних методів навчання шахам на логіко-аналітичне мислення дошкільників

Анотація. *У статті було проаналізовано підходи до формування логіко-аналітичного мислення у дітей дошкільного віку. З'ясовано, що логіко-аналітичне мислення допомагає дітям дошкільного віку орієнтуватися в навколишньому світі, розуміти причинно-наслідкові зв'язки, будувати елементарні моделі і вирішувати прості задачі. Стратегічні ігри, зокрема шахи, сприяють розвитку ключових розумових операцій. Використання цифрових і традиційних методів навчання, може суттєво підвищити результативність формування логіко-аналітичного мислення у дошкільників. Виявлено, що традиційні методи забезпечують глибше засвоєння основних принципів гри та сприяють розвитку соціальних навичок, таких як комунікація та співпраця. Водночас, цифрові інструменти дозволяють за допомогою інтерактивних платформ швидко й ефективно залучати дітей до навчання, покращуючи їхню мотивацію та самостійність у процесі освоєння гри. З огляду на це, комбіноване навчання шахам, що включає як онлайн-інструменти, так і традиційні методики, є найбільш ефективним підходом для формування логіко-аналітичного мислення у дітей дошкільного віку, оскільки воно дозволяє інтегрувати найкращі аспекти обох підходів і забезпечує індивідуалізований підхід до кожної дитини.*

Ключові слова: *дошкільна освіта, цифрові інструменти, ігровий підхід, онлайн-платформи.*

Problem Statement. The development of preschool children is a complex and multifaceted process that involves the growth of speech, thinking, attention, memory, and imagination. This development takes place through active exploration of the surrounding world, experimentation, and interaction with the environment. Fundamental principles of this process include a gradual shift from concrete actions to abstract thinking, enhancement of logical reasoning abilities, the formation of imagination and perception, and the advancement of memory and attention. This stage is essential for a child's future learning and overall development, as it is during the preschool years that foundational knowledge and core cognitive skills are established. Creating a supportive environment and selecting appropriate methods are crucial for fostering intellectual growth.

One effective approach to enhancing children's ability to analyze situations, draw conclusions, and model potential behaviors is the use of chess. Through gameplay, children engage in active social interaction, which encourages objective perception of their own traits as well as those of their peers. This, in turn, supports the development of self-esteem, self-regulation, and self-control. In light of the rapid advancement of digital technologies, online chess learning platforms are being increasingly adopted. These platforms offer interactivity, visualization, and gamification, enriching the educational experience. Consequently, there is a need for scientific inquiry and comparative analysis of various methods of teaching chess and their effects on the development of logical and analytical thinking in preschool children.

Literature Review. Chess, as an intellectual board game, not only promotes the development of logical thinking but also actively engages children in analysis, strategic planning, and decision-making. Research conducted by N. Manzheliy and T. Fazan indicates that the use of board games supports the cognitive growth of older preschool children and contributes to the formation of both life and social skills [5]. According to N. Ciprian, E. Razvan Sandu, and T. Stefan, chess is a sport that integrates competition with intellectual engagement, combining strategic reasoning, analytical abilities, psychological resilience, and certain physical demands. This form of cognitive activity may significantly influence the long-term behavioral development of children by fostering self-discipline, determination, and willpower [11].

Studies addressing traditional methods of teaching chess underscore the importance of direct interaction between teachers and students. As highlighted by O. Kuznetsov and M. Matvienko, conventional instructional methods such as chess clubs, teacher-led explanations of rules, and structured competitions help children acquire foundational knowledge of the game, comprehend its rules, and improve concentration [3].

On the other hand, recent research highlights the significance of incorporating digital platforms into early childhood education. According to R. Lamrani and E. Abdelwahed, traditional instructional methods often fail to maintain sufficient student engagement, which negatively impacts learners' activity and involvement. In this context, the implementation of innovative approaches is essential for enhancing the quality of education and fostering more active student participation in the learning process [12].

I. Kolesnikova and O. Orlova emphasize that preschoolers in the 21st century are active users of digital technologies. Contemporary digital tools tailored to the developmental needs of this age group include a wide range of interactive games and educational programs. These tools support multidimensional development, from the formation of algorithmic thinking to the enhancement of social competencies [2].

Research by N. Behnamnia, A. Kamsin, M. Ismail, and A. Hayati demonstrates that combining traditional game-based approaches with digital technologies positively influences the development of logical and analytical thinking in preschool children. This integration supports the growth of critical analysis skills and spatial reasoning, while also increasing children's interest in cognitive tasks and motivation to learn within an interactive environment [15].

In summary, the analysis of relevant literature affirms the necessity of identifying optimal instructional strategies that integrate both conventional and modern educational tools to support the development of logical and analytical thinking in preschool-aged learners.

The purpose of the article is to evaluate the effectiveness of online platforms and traditional methods of teaching chess in fostering logical and analytical thinking in preschool children.

The objectives of the article are as follows:

1. To examine current approaches to developing logical and analytical thinking in preschool children.
2. To identify the didactic characteristics of both traditional and digital methods of chess instruction within preschool educational settings.
3. To compare the impact of online platforms and conventional teaching methods on the development of logical thinking.

Presentation of the Main Research Material. Logical and analytical thinking forms the foundation for the continued development of children's cognitive abilities. Its formation during the preschool years represents a critical stage that supports not only academic success in school but also the harmonious development of the child's personality. To effectively foster this type of thinking, it is essential to consider a range of theoretical approaches (Table 1).

Table 1

Theoretical approaches to the formation of logical-analytical thinking in children

Approach	Description
Cognitive-developmental	Focused on the age-specific features of a kid's intellectual development. Logical and analytical thinking can only be developed by gradually making tasks more challenging, which encourages the transition to logical operations: classification, comparison, and analysis.
Personality-oriented	Focused on each kid's individual characteristics. Tasks are selected based on the kid's abilities, interests, and emotional state.
Game-based	Through play, children learn to set goals, build strategies, predict consequences, and make decisions.
Information-digital	The formation of logical and analytical thinking through digital educational environments and online platforms.

Source: developed based on analysis [8; 15].

In contemporary settings, marked by the rapid expansion of information flows, educators in preschool institutions face the challenge of identifying methods that are both effective and engaging for fostering children's cognitive and creative abilities. One of the most effective strategies in this domain is the use of game-based learning, particularly board games that integrate entertainment with educational value. This format provides optimal conditions for encouraging initiative, enhancing decision-making skills, strengthening logical reasoning, and supporting the development of social interaction abilities [4]. Board games facilitate the formation of core mental processes such as analysis, synthesis, comparison, and generalization, all of which positively influence the intellectual development of preschool-aged children.

Strategic games, particularly chess, which require planning actions and anticipating the opponent's intentions, play a significant role in developing logical thinking in children. The flexibility and variability of game scenarios encourage children to independently establish interaction rules, organize the gameplay, and work toward achieving desired outcomes [5, p. 56]. This method promotes responsibility, initiative, and independence as essential personality traits.

Chess addresses several key objectives in preschool education. First, it facilitates the development of fundamental mental operations such as analysis, synthesis, comparison, generalization, classification, and drawing analogies, while also enhancing children's ability to plan and reflect on their actions. Second, chess stimulates the growth of flexible thinking, imagination, creativity, argumentation skills, and the ability to make elementary logical inferences. Chess instruction also helps children cultivate purposeful self-regulation, strengthen willpower, build constructive relationships with peers and adults, and engage in self-reflection through social interaction.

Chess, as a sport, offers opportunities for professional development. Children who regularly engage in the game have the potential to achieve notable results, including earning sports ranks, attaining master-level titles, and representing their regions in competitions at various levels. Chess also serves an important educational function, positively influencing a child's personal development regardless of future athletic achievements [1, p. 121]. It is important to recognize that while all children possess natural aptitudes, learning even the basic rules of chess requires pedagogical support. During this stage, preschoolers begin to develop fundamental ideas about chess as an intellectual activity that combines enjoyment with complexity and demands perseverance, consistency, and intrinsic motivation to learn.

Effective chess instruction in preschool education requires appropriate material and technical support, including the following components: tabletop chessboards with complete sets of pieces, game tables, chess clocks, educational games designed to teach the rules of chess, and instructional materials such as albums, portraits of renowned chess players, illustrations, photographs, and wall-mounted magnetic boards with chess piece sets. Wooden or plastic chess sets with standard board dimensions of 40 x 40 cm and medium-sized pieces are considered optimal for preschool-aged children [6, p. 22].

Smaller boards are not recommended because the pieces are placed too closely together, which complicates spatial orientation on the board and may cause difficulty in perceiving and handling the pieces due to their small size.

When introducing preschoolers to chess, the primary objective is to foster interest in this intellectual activity, which is a key responsibility for both parents and educators [14]. To achieve this, it is advisable to combine formal instruction in specialized chess clubs or groups with informal play sessions at home. At the initial stage, the game does not require any specific skills or prior preparation from the child. Considering the developmental characteristics of preschool-aged children, the most effective introduction to chess should occur through play. Imposing excessive theoretical content at this stage is inappropriate, as it may diminish the child's motivation for further learning. Instead, the emphasis should be placed on simple practical tasks, such as placing white pieces on black squares and black pieces on white squares, which helps cultivate spatial awareness, color recognition, and logical reasoning.

A playful learning approach helps children sustain interest in new material and prevents fatigue during the learning process. An essential component is the organization of extracurricular activities, which may include games, exercises, tasks, diagram analysis, problem-solving, quizzes, entertainment events, and riddles [6, p. 25]. These activities support the effective reinforcement of the knowledge and skills acquired by preschoolers.

The methodology for introducing preschool children to the fundamentals of chess involves the use of specially adapted forms of presenting educational material that enhance understanding of the game's essence, objectives, strategic aims, the value of pieces, as well as the logic of decision-making and position evaluation. Effective instructional methods include clear and accessible explanations of concepts, the use of metaphors and analogies, and the incorporation of artistic imagery.

A comparative analysis of two methods of presenting the same content revealed differing levels of comprehension. A rational, academic explanation of chess tends to be more suitable for children who already possess a basic understanding of the game's rules and structure. In contrast, an imaginative and metaphorical approach, incorporating competitive themes and portraying chess pieces as "warriors" or "armies," engages younger preschoolers more effectively through emotional involvement and heightened interest [3, p. 238]. Therefore, the integration of fairy tale elements, games, and imaginative scenarios into chess instruction helps activate children's cognitive engagement and supports the development of logical and analytical thinking.

The memory and attention of preschool children function primarily on an automatic level, with limited conscious control. Typically, events marked by vividness and emotional intensity are more easily retained, becoming focal points of attention and memorization. Consequently, digital tools, particularly online applications and games, have gained relevance by presenting information in visually engaging and dynamic formats [2, p. 190].

Among the popular applications suitable for teaching chess to preschool children, the following are noteworthy:

1. ChessKid is an online platform accessible on both personal computers and mobile devices. It offers a broad range of educational materials, including animated video lessons, training exercises, opportunities to play against a computer or other users, and a motivational reward system. The platform ensures a safe digital environment by excluding third-party chats, thereby protecting children online [7].
2. Magnus Trainer – Train Chess is an educational mobile application for learning chess, developed with the involvement of world chess champion Magnus Carlsen. The app targets users of all ages, including children, and combines instructional modules with interactive tasks presented in a game-based format [13].
3. Gambitius is a platform that facilitates chess tournament organization and step-by-step instruction in the rules of chess. It takes into account children's developmental stages, starting from age three, and includes progress tracking and a system of motivational rewards [9].

4. Chess Adventure for Kids is a mobile application that integrates fundamental chess concepts with adventure game elements. It is designed as an engaging storyline in which children advance through levels, solve chess puzzles, and interact with animated characters. The app is available on iOS and Android tablets and mobile devices [10].

These resources offer an interactive way to learn the fundamentals of chess, supporting the development of attention, memory, and logical reasoning in a convenient and accessible format. At the same time, the integration of digital platforms does not diminish the value of traditional learning approaches. In particular, direct interaction with teachers and peers remains a crucial component of children's social and emotional development (Table 2).

Table 2

Advantages and Disadvantages of Online Platforms and Traditional Methods of Teaching Chess

Teaching method	Advantages	Disadvantages
Online platforms	- high interactivity and motivation; - adaptation to the individual pace of the child; - quick feedback; availability anytime, anywhere.	- limited development of communication skills; - possible fatigue due to prolonged screen time; need for technical assistance.
Traditional teaching methods	- direct live communication with the teacher and other children; - development of social interaction; - emotional contact and support.	- requires more time and effort, as well as appropriate material resources; motivation may decrease without game reinforcement.

Source: author's development

Based on the comparative analysis, the optimal solution is to integrate online platforms with traditional methods of teaching chess. This approach allows educators to combine the strengths of both formats, offset the limitations of each, and provide an individualized learning experience for every child. Modern educators must be able to effectively blend traditional practices with innovative strategies, and classical teaching methods with contemporary pedagogical trends.

Conclusions. The analysis of the impact of online platforms and traditional methods of teaching chess has revealed distinct differences in how they influence the development of logical and analytical thinking in preschool children. Contemporary online platforms demonstrate strong potential due to their interactivity, vivid visualization, and adaptive technologies, which stimulate cognitive processes and enhance attention, memory, and analytical abilities. At the same time, traditional teaching methods, which rely on direct interaction with teachers and peers, not only foster logical thinking but also contribute to the social and emotional development that is essential for the child's holistic growth. A combined approach to chess instruction that integrates both online tools and traditional methods appears to be the most effective strategy for cultivating logical and analytical thinking in preschool-aged children.

Prospects for further research include examining the effectiveness of blended instructional models that integrate digital tools with conventional teaching methods to enhance the development of logical thinking in preschool learners.

References

1. Kashubina, L. M. (2017). Shakhy – yak zasib rozumovoho rozvytku. *Pidvyshchennia yakosti osvity: stan, problemy, perspektyvy: materialy Vseukrainskoi naukovoi Internet-konferentsii* (p.121-126). Kryvyi Rih : KDPU. (in Ukrainian).

2. Kolesnikova, I. V., & Orlova, O. A. (2022). Tsyfrovizatsiia osvitnoho protsesu v zakladi doshkilnoi osvity. *Innovatsiina pedahohika,* 50, 188-191. http://www.innovpedagogy.od.ua/archives/2022/50/part_2/37.pdf (in Ukrainian).

3. Kuznietsov, O. V., & Matviienko, M. I. (2017). Vykhovni aspekty v metodychnykh osoblyvostiakh vprovadzhennia navchannia hry v shakhy v orhanizatsiiu rukhlyvykh ihor uchniv molodshoho shkilnoho viku. *Naukovyi chasopys,* 3K(84), 236-240. http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/Nchnpu_015_2017_3K_70.pdf (in Ukrainian).

4. Kulish, I., & Hoi, S. (2020). Rozvytok lohichnoho myslennia yak vazhlyvyi komponent pidhotovky ditei starshoho doshkilnoho viku do shkoly. *Osvitni obrii,* 2(51), 58-62. http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?I21DBN=LINK&P21DBN=UJRN&Z21ID=&S21REF=10&S21CNR=20&S21STN=1&S21FMT=ASP_meta&C21COM=S&2_S21P03=FILA=&2_S21STR=obrii_2020_2_1 (in Ukrainian).

5. Manzhelii, N. M., & Fazan, T. P. (2025). Vykorystannia nastilno-drukovanykh ihor u rozumovomu vykhovanni ditei doshkilnoho viku. *Imidzh suchasnoho pedahoha,* 2(221), 54–60. https://doi.org/10.33272/2522-9729-2025-2(221)-54-60 (in Ukrainian).

6. Semyzorova, V. V., Dukhnovska, O. I., & Pashchenko, L. Yu. (2015). Mudri shakhy: Prohrama ta metodychni rekomendatsii z navchannia ditei starshoho doshkilnoho viku hry v shakhy (72 p.). Mandrivets. (in Ukrainian).

7. Onlain-shakhy dlia ditei – Absoliutno bezpechno ta bezkoshtovno. *ChessKid.com.* https://www.chesskid.com/uk/ (in Ukrainian).

8. Teoriia rozvytku Zhana Piazhe: stadii rozvytku intelektu. *ALEXUS*. https://alexus.com.ua/teoriya-zh-piazhe-pro-intelektualnij-rozvitok-ditini/#lwptoc (in Ukrainian).

9. Shakhy dlia ditei. *Chess for kids*. https://gambitius.io/uk (in Ukrainian).

10. Chess Adventure for Kids. *Android Apps on Google Play.* https://play.google.com/store/apps/details?hl=uk&id=chesskid.adventure&utm_source=chatgpt.com (in English).

11. Ciprian, N., Razvan Sandu, E., & Stefan, T. (2023). Study Regarding the Effectiveness of Chess in Children. *GYMNASIUM*, 24(1), 101–116. https://doi.org/10.29081/gsjesh.2023.24.1.08 (in English).

12. Lamrani, R., & Abdelwahed, E. H. (2020). Game-based learning and gamification to improve skills in early years education. Computer Science and Information Systems, 17(1), 339-356. https://doi.org/10.2298/CSIS190511043L (in English).

13. Magnus' Kingdom of Chess App: A Chess Learning Game for Kids. (2018). *The Mama Maven Blog.* https://www.themamamaven.com/magnus-kingdom-of-chess-app-a-chess-learning-game-for-kids/ (in English).

14. Poston, D. I., & Vandenkieboom, K. K. (2019). The Effect of Chess on Standardized Test Score Gains. *SAGE Open*, 9(3). https://doi.org/10.1177/2158244019870787 (in English).

15. Behnamnia, N., Kamsin, A., Ismail, M. A. B., & Hayati, A. (2020). The effective components of creativity in digital game-based learning among young children: A case study. *Children and Youth Services Review*, 116, 105227. https://doi.org/10.1016/j.childyouth.2020.105227 (in English).