

RESEARCH ARTICLE

Developing Imagination and Creative Thinking In 6–7-Year-Old Children Through Second-Language Learning Using Mind Maps

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VOLUME: Vol.06 Issue05 2026

PAGE: 342-347

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Abstract

The article examines the development of imagination and creative thinking in 6–7-year-old children through second-language learning. The relevance of the study is determined by the need to improve foreign-language teaching methods at the preschool level while taking into account the age-specific characteristics of children's cognitive and creative development. The aim of the study is to provide a theoretical rationale and experimentally evaluate the effectiveness of using mind maps in second-language instruction to foster imagination and creative thinking among older preschool children.

The study employed theoretical analysis of the scientific literature, pedagogical observation, a pedagogical experiment, and comparative analysis of diagnostic results. An experimental comparative study was conducted with 120 children aged 6–7 years enrolled in preschool educational organizations in the Kashkadarya, Bukhara, and Samarkand regions of the Republic of Uzbekistan. In the experimental groups, instruction was conducted using mind maps, interactive tasks, and elements created in the Scratch environment, whereas the control groups were taught using traditional instructional methods.

To assess developmental dynamics, indicators adapted from the MELQO model were used, including language literacy, mathematical-cognitive and social-emotional development, creative play, and imagination. The experimental results demonstrated higher performance in the experimental groups compared with the control groups. An aggregated analysis of the results across the three regions revealed an average increase of 23.3% in the assessed indicators.

The findings confirm the effectiveness of integrating visualization, mind maps, and interactive tasks into second-language instruction as a means of supporting imagination, creative thinking, and cognitive engagement among 6–7-year-old children.

KEY WORDS

6–7-year-old children, preschool education, second-language learning, foreign language, imagination, creative thinking, mind map, Mind Map, Scratch, MELQO, visualization, creative development.

INTRODUCTION

Modern preschool education is aimed not only at developing children's knowledge and skills but also at fostering their

cognitive autonomy, imagination, and creative abilities. The age of 6–7 is particularly significant, as children actively broaden their understanding of the world around them, establish new semantic connections, and begin to independently transform the information they receive.

Second-language learning is particularly important in this context, as effective language learning involves establishing semantic and associative connections between a new word, its image, an action, and previously acquired experience. L. S. Vygotsky viewed imagination as an active process of transforming acquired experience and creating new images through its modification and recombination [1]. J. P. Guilford associated creative activity with divergent thinking [2], while E. P. Torrance emphasized the importance of children's ability to identify problems and transform their initial conceptions [3].

One of the tools for organizing such a process is the use of mind maps, which allow information to be represented in the form of interconnected concepts, images, and associations; the theoretical foundation for this approach is provided by A. Paivio's dual-coding theory [4]. For 6–7-year-old children, a mind map should not be a complex diagram designed for memorization, but rather a tool for playful, imagery-based, and associative learning that enables children to connect a target word with an image, color, movement, and personal experience.

At the same time, an analysis of existing approaches indicates that second-language learning and the development of children's creative potential are often considered separately, while the purposeful integration of language learning, visualization, mind maps, interactive tasks, and the assessment of comprehensive developmental indicators remains insufficiently explored. Research on bilingualism suggests that language experience is associated with the development of certain components of executive functions, although the magnitude of these effects depends on the conditions of language experience [7; 8]. An experimental study conducted by O. Polat with children aged 60–72 months demonstrated the positive effect of systematic Mind Mapping on the development of creative abilities [9], while other studies have confirmed the potential of Mind Maps for developing cognitive and social concepts among preschool children [10; 11]. At the same time, the effectiveness of visualization depends on the content of the tasks and the pedagogical organization of the learning process, making the integration of mind maps into second-language learning

particularly relevant, including their combination with interactive digital tasks [12; 13].

Thus, the main research problem lies in the insufficient development of a methodology that integrates second-language learning, visualization, mind maps, and interactive tasks with the purposeful development of imagination and creative thinking in 6–7-year-old children. This led to the following research question: Does the systematic use of mind maps and interactive tasks in second-language learning contribute to greater development of children's imagination and creative thinking compared with traditional lesson organization?

The development of children's imagination and creative thinking can also be considered within a broader psychological and pedagogical context. According to J. Piaget and B. Inhelder, the cognitive development of older preschool children is associated with a transition from sensorimotor and action-based forms of thinking toward more generalized and symbolic representations [5]. J. Bruner pointed out that learning is most effective when children actively interact with learning materials rather than passively receive ready-made information [6]. These theoretical perspectives support the idea that second-language learning should be based on active, visual, and playful activities that correspond to the cognitive developmental characteristics of 6–7-year-old children.

The relationship between bilingual experience and cognitive development is also of particular importance. E. Bialystok notes that the use of two linguistic systems is associated with specific patterns of attentional control [7]; however, the cognitive benefits of bilingualism depend on the age at which language learning begins, the level of language proficiency, and the intensity of language practice [7; 8]. Research on neuroplasticity has also shown that second-language acquisition is accompanied by structural changes associated with the intensity and duration of language practice [8].

A fundamental characteristic of mind maps is their nonlinear organization of information, in which a central concept is connected to a number of second-order concepts, which can, in turn, be expanded through additional features, images, and associations. This structure enables children to perceive not only individual elements of learning material but also the relationships among them.

An additional area of focus is the use of digital technologies. Their pedagogical effect depends not on interactivity itself, but

on whether children are given opportunities to independently select elements, establish connections, modify the initial structure, and create their own combinations [18; 19]. Research on multimedia learning emphasizes the importance of presenting verbal and visual information in a coordinated manner and the need to prevent excessive cognitive load [12].

For this reason, in the proposed methodology, the mind map is used as a tool for organizing children's activities according to the following sequence: word perception → association with an image → establishment of associations → interaction with the material → transformation of information → use of the linguistic unit in a new situation.

This sequence makes it possible to integrate processes that are often considered separately in traditional instruction: acquisition of language material, development of associative connections, activation of imagination, and creative use of language.

The aim of the study is to provide a theoretical rationale for and experimentally verify the effectiveness of a methodology for developing imagination and creative thinking in 6–7-year-old children through second-language learning using mind maps, interactive tasks, and creative activities. The objectives of the study included: analyzing psychological and pedagogical approaches to the development of imagination and creative thinking; determining the potential of second-language learning for stimulating creative activity; substantiating the use of mind maps as a means of visualization; developing a system of language-based, play-based, and creative tasks; determining criteria for assessing children's development; and experimentally verifying the developed methodology.

The object of the study is the process of second-language (English) learning among 6–7-year-old children; the subject of the study is the content, methods, and pedagogical conditions for developing children's imagination and creative thinking through visualization using mind maps and the assessment capabilities of the MELQO model.

The research hypothesis is that the development of imagination and creative thinking in 6–7-year-old children will be more effective if second-language learning is organized as a process of visual, associative, and creative transformation of language material, and if the use of mind maps in combination with creative and interactive tasks enables children to establish more diverse connections between a word, an image, an action, and personal experience.

METHODOLOGY

The methodological framework of the study comprised a theoretical analysis of the scientific literature, pedagogical observation, visualization of language material through mind maps, a pedagogical experiment, a comparative analysis of the results of the control and experimental groups, and statistical data processing.

An additional component of the methodology was the use of the Scratch environment, through which static mind maps were transformed into interactive objects. Scratch was used not as a subject for programming instruction, but as a tool for creating a dynamic visual environment. To assess the results, a system of indicators adapted to the MELQO model and the content of the "Ilm yo'li" program was used, including language literacy, mathematical-cognitive development, social-emotional development, creative play, and imagination [25; 26].

The experimental comparative part of the study was conducted with the participation of 120 children aged 6–7 years in preschool educational organizations in the Kashkadarya, Bukhara, and Samarkand regions. In each region, an experimental group and a control group of 20 children each were formed, with a total of 60 children in each group category. The experimental groups were taught using the developed methodology based on mind maps and interactive tasks, while traditional teaching methods were used in the control groups.

At the initial stage, the baseline developmental indicators of the children were determined across four areas corresponding to the MELQO model and the "Ilm yo'li" program. The experimental methodology involved a gradual increase in the complexity of children's activities: presentation of new material with visual support → establishing connections with elements of the mind map → tasks involving supplementation and combination → independent use of the material in a play-based or creative situation. A distinctive feature of the experimental intervention was the use of mind maps whose elements were animated through the Scratch environment. This made it possible to incorporate movement and sequential changes in the visual material into the learning process without replacing the teacher's role.

The mind map was used exclusively as ready-made didactic material and served as a means of organizing children's cognitive activity. Depending on the content of the lesson,

children could identify relationships between objects, characteristics, and actions; supplement the existing structure; select appropriate images; and use the target words they had learned to create new combinations. A separate component of the methodology involved interactive tasks implemented through Scratch. The dynamic presentation of elements made it possible to incorporate movement and sequential changes in the visual material into the learning process. At the same time, the digital component did not replace the activities of the teacher or the child but was used as an additional means of visualization and interaction.

The diagnostic component of the study focused on assessing changes across the identified areas of development. To determine the level of development of the assessed indicators, criteria were developed based on the content of the "Ilm yo'li" program and the adapted MELQO domains. The results obtained were recorded for each child, after which individual and group-level indicators were compared.

The experimental work consisted of three stages: defining the assessment criteria, conducting the experimental pedagogical intervention, and analyzing the results. This structure made it possible to compare the indicators before and after the intervention and identify differences between the groups. It also enabled the study to assess not only the effectiveness of individual exercises but also the overall effectiveness of an integrated pedagogical system combining second-language learning, visualization, mind maps, interactive technologies, and creative activities.

RESULTS

The analysis was conducted across four areas: language literacy, mathematical-cognitive development, social-emotional development, and creative play and imagination [25; 26].

In the Kashkadarya region, the positive result in the control group was 60%, compared with 80% in the experimental group. At the same time, the number of children demonstrating a high level of development increased in the experimental group, while the number of children at the lowest level decreased.

In the Bukhara region, the positive indicator was 65% in the control group and 90% in the experimental group. Five children reached the "sufficiently high" level, fifteen reached the "sufficient" level, and no children remained at the "close to sufficient" level by the end of the experiment.

In the Samarkand region, the positive indicator was 60% in the control group and 85% in the experimental group. The number of children at the "sufficiently high" level increased from three to six, while the number at the "close to sufficient" level decreased from six to one.

A comparison of the results from the three regions shows that positive dynamics were observed in all experimental groups regardless of the location of the study. The use of dynamic mind maps created in the Scratch environment contributed to an average improvement of 23.3% in the assessed indicators compared with the control groups.

The results obtained suggest that the effectiveness of the methodology is associated not with the use of a digital tool in isolation, but with the integration of several pedagogical components: the mind map provided visual and associative organization of the learning material, creative tasks stimulated the transformation of information, while the interactive elements of Scratch increased the dynamism of children's interaction with the material. Importantly, positive dynamics were observed not only in indicators related to language learning but also in areas reflecting broader child development, allowing the methodology to be viewed as a comprehensive pedagogical approach.

The observed dynamics are consistent with L. S. Vygotsky's view that the development of imagination is associated with the transformation and recombination of elements of accumulated experience [1]. In the experimental groups, linguistic units were incorporated into a system of visual images, associations, and creative tasks, enabling children not only to reproduce words but also to establish new connections. The results are consistent with O. Polat's study, in which the systematic use of Mind Mapping was associated with the development of children's creative abilities [9], as well as with studies on the application of mind maps in preschool education [10; 11; 22]. At the same time, in the present study, the mind map was not used in isolation but as part of the second-language learning process, simultaneously performing organizational, visualization, and developmental functions.

The positive dynamics observed in the indicators of creative play and imagination deserve particular attention. This may be associated with the fact that the tasks required children not merely to reproduce but to transform the material by establishing new connections and creating new situations, which is consistent with the concept of creative thinking as the ability to generate new combinations [2; 3]. The findings are

also consistent with the author's earlier studies on the use of Mind Maps for developing imagination and creative thinking in 5–6-year-old children [20; 21]. This makes it possible to regard the observed effect not as a random outcome, but as one associated with the specific features of the visual-associative organization of learning material.

Importantly, the study does not claim that second-language learning itself automatically increases the level of creativity. Rather, when organized in a specific visual, associative, playful, and creative manner, second-language learning can serve as an additional resource for developing children's cognitive engagement, which is consistent with research on bilingualism that takes into account the age, intensity, and nature of language practice [7; 8].

It is also significant that positive dynamics were observed across several areas simultaneously. The experimental groups demonstrated changes not only in language literacy but also in mathematical-cognitive and social-emotional development, as well as in creative play and imagination. This suggests that the visual-associative organization of learning material may influence not an individual skill but rather the overall nature of children's cognitive interaction with educational content.

The limitations of the study are associated with the fact that the experiment involved 120 children from three regions of Uzbekistan. Therefore, the findings primarily characterize the study sample and cannot be automatically generalized to all preschool children. To further confirm the stability of the identified patterns, it would be advisable to expand the sample, extend the observation period, and examine separately the contribution of each component of the methodology, including mind maps, interactive technologies, and creative tasks.

Based on the results, a pedagogical approach was proposed according to the principle of "from image to word, from word to connection, from connection to creative transformation." A new concept is first introduced to the child through an image or a play-based situation; the word is then connected to the central element of a mind map; the map is expanded with characteristics and related objects; and subsequently, the child uses the established connections in an independent creative situation. This sequence enables a gradual transition from the questions "What is it?" to "What is it like?", "What is it connected with?", and "What can you imagine or create with this word?" At the same time, the teacher does not provide a ready-made system of connections but creates conditions for

the child's independent exploration. The methodology can be applied to various thematic areas (animals, family, food, nature, transportation, etc.), with the complexity of connections gradually increasing from "word–image" to "word–characteristic–action–situation." It can also be incorporated into existing preschool activities without modifying the content of the educational program.

Theoretical analysis showed that imagination and creative thinking develop through the active transformation and combination of accumulated experience [1; 2; 3]. Therefore, second-language learning has developmental potential when children are engaged in associative, playful, and creative activities. In the proposed methodology, the mind map serves as a visual and semantic link between linguistic units, images, and actions [9; 10; 11; 22].

An experimental study involving 120 children aged 6–7 years in the Kashkadarya, Bukhara, and Samarkand regions demonstrated consistent positive dynamics in the experimental groups: 80% compared with 60% in the Kashkadarya region, 90% compared with 65% in Bukhara, and 85% compared with 60% in Samarkand, with an average advantage of 23.3% for the experimental groups across the assessed indicators.

The scientific significance of the study lies in substantiating the possibility of considering second-language learning as a means of comprehensive child development when visual and creative interaction with language material is purposefully organized. The developed methodology integrates mind maps, associative and creative tasks, interactive Scratch elements, and the diagnostic capabilities of MELQO. The practical significance lies in the possibility of applying the developed system of tasks by teachers in preschool educational organizations when teaching a second language to 6–7-year-old children, with adaptation to various thematic areas.

The results of the study should be interpreted in light of its limitations (120 children across three regions), which determines the need for further research involving larger samples and separate assessment of the contribution of individual components of the methodology. Overall, the study confirms the potential of integrating second-language learning with visual-associative and interactive technologies as a means of simultaneously developing language skills, imagination, and creative thinking in 6–7-year-old children.

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