**Presentation date:** August, 2023, **Date of acceptnce:** September, 2023, **Publication date:** November, 2023

41

# IMPACT OF CREATIVE ACTIVITY IN 3D MINIATURE ART CLASSES ON THE DEVELOPMENT OF STUDENTS' COGNITIVE ACTIVITY

## IMPACTO DE LA ACTIVIDAD CREATIVA EN CLASES DE ARTE EN MINIATURA 3D EN EL DESARROLLO DE LA ACTIVIDAD COGNITIVA DE LOS ESTUDIANTES

Aleksandr Prishchepa[1]
E-mail: cafdidpi@mail.ru
ORCID: https://orcid.org/0000-0002-0104-3198
Lyudmila Burovkina[2]
E-mail: burovkinala@yandex.ru
ORCID: https://orcid.org/0000-0001-9775-2206
[1] Don State Technical University. Russia.
[2] Moscow City Pedagogical University. Russia.

Suggested citation (APA, seventh ed.)

Prishchepa, A., & Burovkina, L. (2023). Impact of creative activity in 3D miniature art classes on the development of students' cognitive activity. ***Revista Conrado, 19(95),*** 382-387.

ABSTRACT

The authors investigate the relationship between creative work and cognitive activity by means of miniature sculpting in an educational environment. The study aims to determine how 3D sculpture classes contribute to the development of creative thinking and cognitive processes in elementary school-age children. The research employs the methods of qualitative analysis and observation. Analysis of children's works and observation of their sculpting demonstrates that the method of 3D miniature sculpting not only improves fine motor skills but also acts as a powerful means of self-identification, the development of consciousness, and socialization. The development of fine motor skills and the creation of an authorial image allows a child to integrate into the world of adults and the surrounding environment. The study sheds light on the importance of including 3D sculpture art in educational practice as a means of facilitating creative and cognitive development. The findings emphasize that the artistic process of miniature sculpting not only engages cognitive functions but enables children to interact with the surrounding environment and reveal their unique interpretations of the world. The study reveals the practical potential of children's creativity and gives evidence of the efficiency of introducing children to the arts through the use of techniques and technologies based on academic or folk traditions of creativity.

Keywords:

Children's creativity, fine arts, 3D miniature, creativity, psychology, preschool children.

RESUMEN

Los autores investigan la relación entre el trabajo creativo y la actividad cognitiva mediante la escultura en miniatura en un entorno educativo. El estudio tiene como objetivo determinar cómo las clases de escultura 3D contribuyen al desarrollo del pensamiento creativo y los procesos cognitivos en niños en edad de escuela primaria. La investigación emplea los métodos de análisis cualitativo y observación. El análisis de las obras de los niños y la observación de sus esculturas demuestra que el método de escultura en miniatura en 3D no sólo mejora las habilidades motoras finas, sino que también actúa como un poderoso medio de autoidentificación, desarrollo de la conciencia y socialización. El desarrollo de la motricidad fina y la creación de una imagen de autor permite al niño integrarse en el mundo de los adultos y su entorno. El estudio arroja luz sobre la importancia de incluir el arte escultórico en 3D en la práctica educativa como medio para facilitar el desarrollo creativo y cognitivo. Los hallazgos enfatizan que el proceso artístico de escultura en miniatura no sólo involucra funciones cognitivas sino que permite a los niños interactuar con el entorno que los rodea y revelar sus interpretaciones únicas del mundo. El estudio revela el potencial práctico de la creatividad de los niños y da evidencia de la eficacia de introducir a los niños en las artes mediante el uso de técnicas y tecnologías basadas en tradiciones de creatividad académicas o populares.

Palabras clave:

Creatividad infantil, bellas artes, miniatura 3D, creatividad, psicología, niños en edad preescolar.

## INTRODUCTION

At the initial stages of child development, drawing is the fundamental type of activity in preschool and early elementary school ages. Research by scholars and educators on children's creativity and its importance in the development of consciousness, peculiarities of thinking, and mental processes is extensive both in Russian and foreign literature (Roshchin & Filippova, 2018; Prishchepa et al., 2019). In this case, studies refer to graphic, planar drawings by children, which convey images and phenomena, as the expression says, "fruits of their own imagination", in 2D space, directly attached to a plane, e.g., a sheet of paper, a tablet, or some other medium. Pedagogical practice lacks the potential of research dealing with the vastness of peculiarities of children's 3D creativity. The questions still standing are what is the structure of children's creativity prompting them to self-expression in a 3D medium, whether this means is natural for the development of a child's psyche or characteristic only of a certain type of thinking, what age is this type of creativity is characteristic of, and what are the features of the psyche realized in this process and their objectives, results, and impact on a child's life (Khairullina et al., 2021; Dubrovin et al., 2023). As asserted by R.A. Kutbiddinova (2016), *"working with plasticine images helps the client to take responsibility for their life and recognize their ability to develop appropriate behavior"* (p. 33). In addition, R.M. Chumicheva (1992), notes that *"didactic games are conducted as an independent activity, but they can also be used in individual work with timid shy children or with a group of children with a low level of speech development, a special level of development of thought processes"*. (p. 7)

Miniature plastics date back to the beginning of history in the form of jewelry. It is believed that jewelry appeared before clothes, which is evidenced by the overall appearance of people with primitive lifestyles. Along with the aesthetic component, jewelry serves as amulets and talismans (Bykovskaia & Semenova, 2018). It also served a utilitarian function as clasps, fibulae, hairpins, and more. "*In antiquity, the development of jewelry was primarily dictated mainly by the Egyptians, Greece, and Rome".* (Hejdova & Durdik, 1982, p. 279)

Miniature was widely used in the decoration of wall and table clocks, reliquaries, goblets, and so forth. *"Many magical objects of different times and peoples are often based on a symbolism common to the entire human race, so they come to us from the archetypal space".* (Chernova, 2005, p. 146) Studying the archetypal principle in human consciousness, C.G. Jung asserted that there were some archaic elements to consciousness. Jung suggested that throughout the person's life, the acquisition of experience is heavily influenced by the spiritual symbols of the ancestors. A child inherits the primordial images from the forefathers as elements of the unconscious, as archetypes of the elements, animals, people, and spirits dominating in a particular culture. These images manifest both in creativity, the preferred type of art, and even a specific stage of development of the individual or society.

Psychologists argue that even in human consciousness, in the depths of the subconscious, there are deeply embedded mental primordial images and ideas about the world and life, and this is not contingent on the level of education. A person projects through themselves that which is embedded in them, initially not realizing their creative activity thoroughly, while experiencing enjoyment from the images that come into being (Serikov, 2018).

3D miniatures are used by a child as a crucial means of the emergence of their personality. This represents a preliminary stage in socialization in a game form. A child uses 3D miniatures as the most efficient tool for learning about the surrounding world. In contrast to earlier developmental stages, at this age, a child is interested in anything and everything that surrounds them with all its specific characteristics (Novikova & Sizova, 2019). These areas of interest include the animal kingdom with its various behaviors and habitats, people with their characteristics, behaviors, occupations and their characteristics, architecture, trees, flowers, household objects, interior furnishings, etc.

Previous studies describe an earlier age in the development of a child's character through the lens of fine arts, where it was distinguished as the main sign of the identification of one's own self in the environment of loved ones, but, more often than not, in a fictional world. At this stage, this world is very real and interesting as a medium of socialization, and therefore the plasticity and anatomy of animals are conveyed with special diligence. A child explores this world through modeling. In their works, everything becomes not only similar but also typified. This creative period ends with age. The next stage of personality development may not be related to fine arts and play activities but may be related to the processes available to a child, now in real life. Art can be a factor in the demonstration and realization of the creative abilities of a person and represents the next stage of understanding and feeling (Ganova et al., 2022). This is the stage of self-realization of the experience accumulated either directly individually or as an awareness of other people's experiences.

Over several years, researchers have recorded the phenomenon of recognition of specific features while sculpting 3D miniatures. Significant differences have been discovered in the image of the miniature in 2D and 3D settings. It

has been discovered that when dissecting characters on a sheet of paper, a child often uses some graphic template or previously seen artistic image. This phenomenon is linked to the large number of available gadgets, books, and television shows. A child thus uses a ready-made solution. There is nothing condemnable in this, as a child's psyche tends to choose the easiest solution. In the methodology of teaching, fine arts use this technique as a principle "from simple to complex". The easiest part turns out to be drawing silhouette lines, coloring the background, etc., all the more so because all these lines and spots are conventional and easy to copy. A child's attitude to volume is different. A volumetric image is rather difficult for a child to copy because it does not have a single form set in stone. The silhouette changes with each turn, and each perspective changes the proportions. Therefore, it is easier for children to sculpt on their own, in accordance with their cognitive capabilities. A child draws on all the resources of their organism in their creative work. Accordingly, the miniature implements their mental processes painstakingly, and a child's creative activity has an authorial nature, as opposed to borrowing from other art forms (Nizamutdinova et al., 2018). A child performs the most complex analytical work in the process of sculpting. They have to work out the image from all sides: from above, from below, from the side, etc. They also face the analytical problems of form, proportion, and silhouettes, as well as technological problems. In this case, a child has to make sure that all limbs are attached securely and that the volumetric and plastic image corresponds to their artistic intention (Shitova, 2022; Shevchuk et al., 2023). These are the conditions of cognition of the surrounding world, a certain set of rules of behavior with the surrounding characters and socialization, if only in a game situation.

A child is driven to creativity by their nature. As El Greco once said, "I paint because the spirits whisper in my head". 3D miniature takes a special place in a child's creativity and subsequently accompanies them throughout their life. One way or another, a person does get involved in this type of art. This is an aspect not only of the psychological life and balance in life's conflicts but also of the modeling of worldview situations, albeit in a playful manner. Game practice is free of psychological trauma and social upheaval, especially since its variability is limitless.

Thus, the goal of the study is to explore the relationship between children's creativity, cognitive activity, and the process of sculpting 3D miniatures.

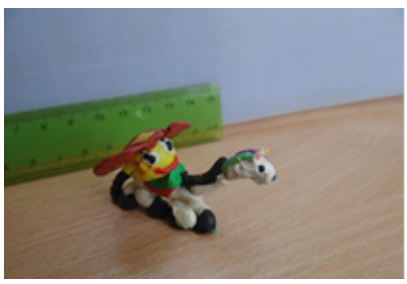
## METODOLOGY

In our practice, we observed the work of a cadet of the Novocherkassk Cossack Corps, who modeled the battles of the 1812 war with a great number of participants in military battles and armament of both the Russian and enemy armies. He played out specific battles that took place in the historical past. This type of work is synergetic in its nature. It successfully combines time, both current and historical, the time for comprehension on sculpting, working out characters, and understanding what is happening and what has happened. This is the utmost comfortable environment that matches a child's psychotype, temperament, and mental and physical capabilities.

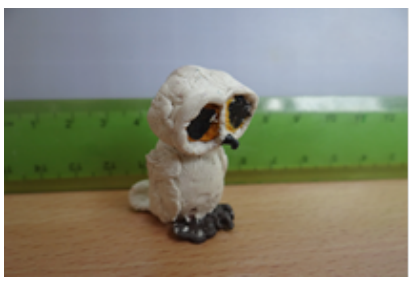
The data collection process involved a combination of qualitative analysis and observational methods to comprehensively explore the relationship between 3D miniature art, creativity, and cognitive activity. During the sculpting sessions, detailed observations were made to document the approach to sculpting, the choice of subjects, techniques, and the level of detail incorporated into their sculptures.

## DEVELOPMENT

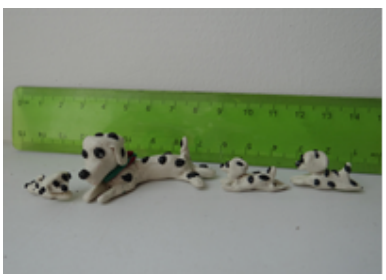
Throughout the study, participants exhibited a remarkable degree of engagement and enthusiasm while creating 3D miniature sculptures. A diverse array of subjects and themes emerged from the students' artistic endeavors, ranging from animals and nature to everyday objects and imaginative characters (Figures 1a-f).



a



b



c

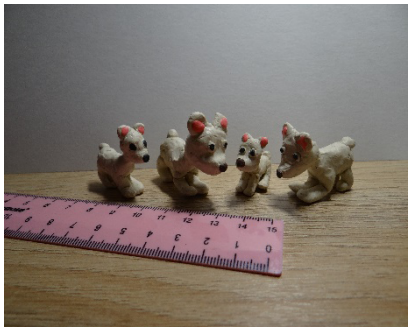
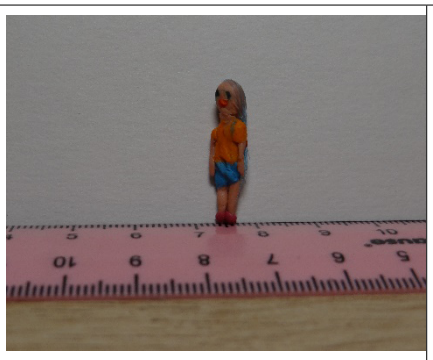
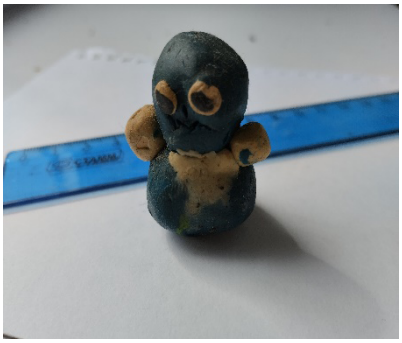
| | | |
|---|---|---|
|  |  |  |
| d | e | f |

Figure 1. Examples of children's works.

We conclude that the creation of 3D miniature sculptures is not exclusive to the present. Historical sources evidence that this activity has been present in all historical periods and in all formations and civilizations. For instance, 3D miniature sculptures have been found in the Altai Krai, Russia, in the Denisov cave, the chronology of which dates back 40 million years ago.

In the traditional culture of Japan, netsuke as an art form occupies a special place. It simultaneously represents the carver's highest skill, a utilitarian attribute, and a philosophy of the people. Netsuke refers to a special form of socialization, the understanding of art, and the decoration of meanings by the people, which the carver assigns to each image. Miniature sculptures were also widely used in Ancient Rome. It suffices to look at earrings with figures of Ertas dated to the 2nd century BC. Jung once mentioned that ***"there are archaic psychic components which have entered the individual psyche… When I was a child I performed the ritual just as I have seen it done by the natives of Africa".*** (Chernova, 2005, p. 145)

The modern world also has numerous artists working with 3D sculpture. D. Ghetti carves sculptures from the lead of a simple lead pencil. Another example is S. Kang, who uses recycled materials for his miniatures, drawing attention to the importance of environmentalism in the current times.

The topic of patriotism also concerns modern miniature sculptors. V. Demchenko and V. Borodin make compositions of characters dedicated to the Civil War of 1918 and the Great Patriotic War of 1941-1945. I. Kordiukov focuses on the theme of 1812. A. Deriabin addresses the problems of minority peoples of Russia. S. Makelayev deals with the theme of the Great Patriotic War.

Furthermore, Karataieva (2016), notes that ***"many objects discovered by archaeologists prove that people have been contemplating the origin of the world, the appearance of man on earth, life and death, and the soul and the birth of a child since ancient times".*** (p. 21)

The process of 3D miniature sculpting engages children in many complex neurodevelopmental processes that go beyond mere intellectual activity. The process of sculpting uncovers children's creative potential, which facilitates their adaptation to the social environment in a gamified form. The scenarios chosen by children for their miniatures cover a wide range of life situations. These creative depictions often show an impressive marvel of detail, seeking to reflect reality in the true proportions and properties of the material.

Children use all kinds of colors of plasticine to convey various features in their sculptures, using remarkable means of expression. Their creations differ from the works of professional artists, as children focus on their exceptional sense of truth, and each touch and form contributes to a truthful depiction. The search for truth in their miniature models unfolds in a child's mental reactions, a phenomenon that operates on an intuitive level even if not consciously realized (Prishchepa & Vlasova, 2017).

Embedded in a child's subconscious mind is the knowledge of how to sculpt. A child is often unaware of the skill but is driven by an innate desire to engage in creative endeavors. The convergence of physiologic readiness, age-appropriateness, and brain activity creates a compelling incentive for children to begin their creative journey and gain a solid foundation of life experiences.

The processes of creating 3D miniatures go beyond artistic exploration. They tap into a child's innate capacity for self-expression, cognitive growth, and emotional development. Understanding the deep relationship between creativity and neurological processes, teachers and educators can use the capacities of 3D sculpture as an educational tool that not only promotes the development of autistic abilities but contributes to the comprehensive development of children's cognitive activity.

## CONCLUSIONS

Through an examination of historical, psychological, and artistic perspectives, we have discerned that children's affinity for 3D miniatures is rooted in their inherent curiosity, imagination, and tactile exploration. This form of creative activity enables children to bridge the gap between their inner worlds and the external realities they encounter. The use of various materials, colors, and details in sculpting these miniatures empowers children to not only externalize their thoughts and emotions but also to engage in cognitive exercises that enhance their spatial awareness, attention to detail, and problem-solving skills.

Children's favorite method of modeling is detail by detail. They do not employ the method from the general to the particular but prefer to work in the opposite way. This manner is determined by a number of factors. One of these is the peculiarities of their thinking. Children are unable to comprehend complex, compound, and generalized objects. Each detail has to be comprehended and sculpted separately and only then attached to a larger body part, in the case of sculpting an animal. At this age, a child's brain is not yet able to form long chains of interconnected thought processes, establish cause-and-effect relationships and the regularity and subordination of elements, or make generalizing conclusions about complex logical constructions. The nature of a child's thinking development in children points them to the sculpting technique most appropriate for their age. In addition, children have a vital need for color, meaning that each detail has to match the natural palette, i.e., the natural environment or the color of an animal, the color of a person's clothing, a plant, etc. Apart from saturating objects with the color of the natural environment, children often resort to the fantasized coloring of some mythological, fairy-tale characters. In individual creativity, children utilize virtually all the effects accessible to their minds.

## *REFERENCES*


Bykovskaia, M. A., & Semenova, M. A. (2018). The role of aesthetic upbringing in the harmonious development of a child's personality. ***World of Science, 6***(1), 1-8.

Chernova, A. (2005). Modern encyclopedia of world things. Avita+.

Chumicheva, R. M. (1992). ***To preschoolers about painting: A book for kindergarten teacher***. Prosveshchenie.

Dubrovin, V. M., Chumenko, A. L., & Burovkina, L. A. (2023). Actualization of Russian culture in modern society. ***Pedagogical Scientific Journal, 6***(2), 21-27.

Ganova, T. V., Terekhova, E. S., & Trufanova, T. V. (2022). Modern trends and practices in art education. ***Bulletin of the International Centre of Art and Education, 2***, 7-19.

Hejdova, D., & Durdik, J. (1982). ***Illustrated encyclopedia of antiquities***. Artia.

Karataieva, N. F. (2016). IHistorical stages of the development of small forms sculpture. ***Dekorativno-prikladnoe iskusstvo i obrazovanie, 4***(19), 16-27.

Khairullina, E. R., Oshchepkov, A. A., Lushchik, I. V., Lampsi, O. E., Romanov, I. V., Burovkina, L. A., Krupnov, Y. A., & Butyrin, A. Y. (2021). The influence of the pedagogical technology for motivation development on the value self-determination of students with a high level of creative thinking. ***Revista on line de Politica e Gestao Educacional, 25***(S7), 4025-4039.

Kutbiddinova, R. A. (2016). Use of plasticine in psychological trauma. ***Natsionalnaia assotsiatsiia uchenykh. Psikhologicheskie nauki, 4***(20), 31–33.

Nizamutdinova, S. M., Roshchin, S. P., Shipovskaya, L. P., & Bartsitz, R. C. (2018). Problems of the topical field "art" in modern school. ***International Journal of Engineering and Technology, 7***(3.15), 306-308.

Novikova, L. V., & Sizova, I. N. (2019). Social adaptation of children with disabilities by means of arts and crafts classes. In, S. M. Nizamutdinova (Ed.), ***Kultura i iskusstvo kak vazhneishaia chast edinogo obrazovatelnogo prostranstva stolichnogo megapolisa: Materials of the 4th Scientific and practical conference of the Institute of Culture and Arts of the Moscow City Teachers' Training University***. (pp. 285-290). PERSPECTIVA Training Center.

Prishchepa, A. A., & Vlasova, I. M. (2017). ***Development of the professional competence of design students by universal methods of archetypal fine arts constructions***. Rostov-on-Don: Foundation.

Prishchepa, A. A., Burovkina, L. A., & Maidibor, O. N. (2019). Children's creativity as a basis for the formation of artistic identity of Russia. ***Perspectives of Science and Education, 2***(38), 342-360.

Roshchin, S. P., & Filippova, L. S. (2018). Drawing as an academic discipline in the education of the artist of arts and crafts. ***Art and Education: Methodology, Theory, Practice, 1***, 62-67.

Serikov, V. V. (2018). Experience of a scientific and pedagogical school of personality-development education. Proceedings of Voronezh State University. ***Series: Problems of Higher Education, 2***, 11-18.

Shevchuk, L., Konovalova, M., Italianskaia, L. Kolosova, O., Burovkina, L., & Shangaraeva, L. (2023). Opportunities of using mobile applications by students in the framework of teaching humanitarian subjects focused on the development of sensory-practical activity. ***Revista Conrado, 19***(91), 358-365.

Shitova, E. S. (2022). The use of innovative technologies in arts and crafts classes at children's art schools. In, ***Aktualnye problemy i sovremennye trendy nauki, kultury, iskusstva v tvorcheskom obrazovanii: Materials of the 7th International scientific and practical conference***. (pp. 889-894). PERSPECTIVA Training Center.