

Digital Pedagogy in Early Childhood Language Development

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Chapter 5

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ABSTRACT

The article discusses the peculiarities of using media in preschool education amidst the war in Ukraine. It analyses scholarly research on using traditional and innovative media in teaching preschool children. The research employs a pre-test and post-test study design. The paper aims to study the features and level of development of cognitive activity in six-year-old children and the ability of educators to use media. It presents the experience of using media in various forms of interaction between educators and children and professional training of educators on the possibilities of using media. The main findings indicate positive outcomes of the experimental intervention on the cognitive development of six-year-old children. The use of various media tools by educators significantly contributed to improvements in all

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three criteria of cognitive activity: emotional-motivational, cognitive-activity, and personality-volitional. It proves the effectiveness of using media to increase the level of development of cognitive activity of six-year-old children.

INTRODUCTION

In today's era of societal modernization, people are spending more time immersed in the information field. Media, whether intentionally or unintentionally, perform multiple roles beyond conveying information—they play key roles in education, upbringing, personal development, and enlightenment. As a result, it is crucial to explore the integration of various media into the educational process of preschool institutions to foster active awareness in children, build essential life skills, and strengthen their ability to navigate the modern information landscape.

Media literacy is critically evaluating, analyzing, and creating information disseminated through various media. When the information space is overwhelmed with news, opinions, and data, this ability becomes vital for every individual.

The importance of media literacy has been formally recognized by major global institutions. In 2008, the European Parliament highlighted media literacy as a vital skill for the information and communication society (European Parliament Resolution on Media Literacy in the Digital World of 16 December 2008). This document defines media literacy as an important key ability in the information and communication society. It justifies the necessity of purposeful development of media education in the EU states and provides recommendations for national education systems on specific ways to implement it at various educational levels. The resolution proposed that media education should be integrated into formal education, accessible to all children, and embedded within educational curricula.

Furthermore, the *UNESCO Paris Declaration on Media and Information Literacy*, adopted at the first European Forum on Media Literacy in 2014, and the annual International Media and Information Literacy Week, initiated in 2015, underscore the growing global recognition of media literacy. These initiatives emphasize the necessity of equipping children with media literacy skills from an early age, ensuring that future generations are prepared to navigate the increasingly information-driven world.

One of the most important UNESCO documents on media literacy is the *Seoul Declaration on Media and Information Literacy* (2020). The declaration covers a wide range of issues related to media literacy, from education to policy, and emphasizes the importance of media literacy for all countries and peoples.

In Ukraine, the European integration process has prompted significant legislative changes aimed at promoting media literacy. One landmark development was adopting the *Concept for the Implementation of Media Education* in 2016. This initiative was designed to build an effective media education system for a broad cohort of people, including the youngest citizens. In 2016, the *Concept for the Implementation of Media Education* was adopted to promote the development of an effective media education system in Ukraine. This system aims to ensure the comprehensive preparation of children for safe and effective interaction with the modern media system, as well as the formation of media awareness, media literacy, and media competence tailored to their age and individual characteristics.

The implementation of media education, as outlined in Ukraine's regulatory documents, is guided by key legislative acts such as the Laws of Ukraine *On Education* (2017), *On Preschool Education* (2024), and the *State Standard of Preschool Education* (2021). These documents underscore the importance of equipping individuals with the skills to use media resources competently, reflecting society's growing need for individuals with a responsible and informed approach to media consumption. Media education for preschool children focuses on fostering their comprehensive and harmonious development while shielding them from the potential dangers of an aggressive media environment—such as exposure to inappropriate content like violence, horror, or erotica. It aims to cultivate children's ability to navigate, select, and engage with age-appropriate media products. Given these priorities, the integration of media into preschool education remains of concern.

Since Ukraine has been living under wartime conditions for the past eleven years, with full-scale war in the last three years, children in certain regions are deprived of the opportunity to receive preschool education, which is mandatory under Ukrainian law. The number of preschool institutions located in relatively safe regions has significantly decreased, as children's attendance in these institutions must comply with wartime conditions and protect them from the daily threat of missile attacks. At the onset of the full-scale invasion, most Ukrainian educators were able to partially continue the educational process remotely. Some institutions, including those in relatively safe cities, still use remote learning or organize groups for short-term attendance. The Ministry of Education and Science of Ukraine has developed the *Recommendations on Organizing the Educational Process in Preschool Educational Institutions* for the 2024–2025 academic year. These guidelines outline approaches to organizing the educational process in in-person, blended, and distance learning formats. To prevent reducing educators' responsibilities to mere caregiving or oversaturating children's activities with entertainment during remote or short-term interactions, the proposed system for fostering cognitive activity in six-year-old children through media can be effectively employed.

The next section outlines the main themes of the scholarly research on the use of media for preschool children's development.

BACKGROUND

Rethinking Media in the Modern World

The term “media” originates from the Latin word 'medium,' which means “mediator” or “middle.” It refers to various forms of communication that convey information to an audience through different channels, including television, radio, the Internet, and social networks (Pentiliuk, 2015). Scholars define media as a collection of physical forms and methods of information transmission involving a specific medium in the communication process (Barzilovych, et al., 2017). Marshall McLuhan, a Canadian researcher, famously argued that “the medium is the message”, suggesting that the media channel itself, inherent in its content, plays a critical role in how information is perceived (McLuhan, 1964).

In the 21st century, the proliferation of media has led to its classification into classical (traditional) media and contemporary (innovative) media (Kapliy, 2013). Traditional media—such as newspapers, magazines, television, and radio—are characterized by their one-way communication model, with no direct audience feedback. This results in the audience being passive consumers of information. In contrast, contemporary media, including new information technologies and the Internet, has introduced Web 2.0 technologies that facilitate interaction between authors and audiences. This shift allows consumers to become active participants or “prosumers,” engaging in creating and disseminating content alongside traditional media producers.

Media in Early Childhood Education

Media is one of the main factors shaping the “Alpha generation,” which includes modern preschool children. Scholars argue that the media space has become so integrated into the lives of modern children that it is nearly inseparable from their daily experiences. Consequently, educators face the significant challenge of fostering foundational media literacy in these young learners. This involves developing their skills to navigate the media landscape effectively, think critically, and engage in meaningful cognitive activities.

Some scholars note that media and digital technologies contribute to positive changes in the cognitive sphere of children (Palamar et al., 2021). When used intentionally and strategically, such as to support distance learning, facilitate social

connection, and foster creativity, media can enhance early learning experiences. However, others argue that excessive and unstructured media usage can negatively impact children's social, emotional, and behavioral development (Barr et al., 2020). For instance, studies suggest that excessive screen time can lead to attention deficit, poor social interactions, and unhealthy habits (Jake-Schoffman et al., 2017). Scholars were interested in studying the correlation between the screen time and its effect on children's development. Hadders-Algra (2020) developed an instrument offering a framework to better understand the impact of screen time on early childhood development. The findings suggest that high-quality interactive media use is positively associated with improved developmental outcomes, underscoring the importance of guided, purposeful media interaction. Other researchers report findings that many parents express concerns, citing fears of diminished social skills, attention problems, and potential device addiction, revealing a tension between parental practices and attitudes toward mobile technology (Lauricella, et al., 2017). A group of researchers conducted an analysis of approaches to digital upbringing, emphasizing risk minimization and leveraging technology for the development of preschool-aged children, identifying key strategies for engaging with children through media (Choy et al., 2024). The paper *Technology and Media in Early Childhood Education* (2023) focuses on practical approaches to integrating technology and media into preschool education. It explores topics such as digital portfolios, coding, media literacy, and the use of media to develop children's social and cognitive skills. Special attention is given to ensuring active and interactive use of technology in the educational process. These studies highlight the complexity of media use in early childhood education and the need for a more comprehensive understanding of its nuances.

Furthermore, the existing body of research on media in early childhood education often overlooks the unique challenges posed by conflict settings, such as Ukraine's ongoing war. The impact of trauma, displacement, and disrupted schooling on children's media use and learning experiences is an area that demands greater attention. For Ukrainian scholars and practitioners, the influence of media on early childhood education amidst war is a pressing concern.

According to the *Concept for the Introduction of Media Education in the Preschool Education System of Ukraine* (2016), this system is integrated in nature and aims to protect children from an aggressive media environment. It seeks to develop skills for navigating and choosing appropriate media products through the development of the child's intellectual and cognitive abilities (Naidionova & Slyusarevsky, 2016). Improving the pedagogical process in preschool educational institutions involves the use of up-to-date tools that will help to modernize the educational system and align it with the needs of the child and the context in which this education is provided.

Media in Current Educational Programs

The “Child in Sensory and Cognitive Space: Computer Literacy” component of Ukraine’s 2021 State Standard of Preschool Education emphasizes the importance of digital competence, a key skill children are expected to develop by the end of their preschool years. In this context, digital literacy refers to the ability to effectively use information and communication technologies (ICT) and digital tools to fulfill personal needs and solve learning and play-related tasks. This proficiency is built on fundamental knowledge, skills, and a positive attitude toward technology (Ministry of Education and Science of Ukraine, 2021).

The elective component of the child development program for children from birth to six years, *I Am in the World* (2019) (Aksenova, et al., 2019), emphasizes *Computer Literacy* for older preschool children. This aspect of the program focuses on age-appropriate opportunities for children to use modern technology. The program developers believe that using gadgets supports children’s adaptation to life in the information age, expanding their understanding of the world as they begin to see themselves as “active agents of cognitive activity” (Aksenova, et al., 2019).

Popular Media in Ukraine for Preschool Children

Since the onset of the COVID-19 lockdown in 2020, there has been a marked increase in the attention paid to new media. Among audiovisual media, television continues to hold a central role. Despite the challenges posed by martial law, children’s television remains active in Ukraine, with channels such as *Malyatko TV*, *Pixel TV*, *Plus Plus*, *History*, *Culture*, *NikiKids*, *Animal Planet*, and *Discovery Science* providing programming.

A second category of media includes contemporary media, which differs from traditional forms due to the integration of gadgets and the Internet. These platforms allow not only the transmission of information but also interactive engagement between content creators and consumers. Examples of contemporary media include YouTube channels, internet players, online radio and TV stations, social networks, blogs, and digital services like photo-sharing platforms and online games. The functionality of these video services has evolved, particularly with the expansion of information delivery channels and the introduction of augmented reality (AR) and virtual reality (VR). Research by Palamar, et al. (2021) demonstrates the efficacy of AR technology in fostering cognitive development among preschoolers. For example, AR can be utilized by creating a route from home to preschool using Google Maps and integrating real-time images of nearby landmarks.

Innovative media, such as educational, creative, and adventure applications, offer a variety of tools for cognitive development. For example, free apps like *Kids Good Habits*, *50 Good Habits*, and *Good Habits & Manners for Kids* teach children important values and safety tips, such as internet safety and water safety (Khrynyk, 2023). Educational games like *Khan Academy Kids* and *Doodle Maths* challenge children with tasks designed to develop their mathematical and language skills.

Popular Ukrainian-made applications include *Mouse Alphabet* (Ukr. – Mysheni-atkova abetka), which teaches children letters and helps them form words, and *Funny Animals* (Ukr. – Veseli tvaryny), which uses interactive puzzles to teach children how to identify animals. Other notable apps include *Nambi*, which gamifies basic math operations, and *Who's in the Mountains* (Ukr. – Khto v horakh), which develops counting skills and knowledge of animals. *World of Kindness* (Ukr. – Svit dobra) is another app that fosters empathy and encourages helping children with special needs.

Trauma-informed education and the development of digital citizenship are particularly vital in the context of the ongoing conflict in Ukraine. The pervasive impact of war on students' mental health underscores the need for educational practices that are both trauma-sensitive and supportive. Trauma-informed education provides a framework for addressing the emotional and psychological challenges faced by students, fostering resilience, and enhancing their academic experience within a safe and nurturing environment (Holovatenko, 2024; Miyer et al., 2024).

In parallel, the rise of digital media, including Ukrainian-language YouTube channels like *HeyKids*, *HubbleTrubble*, and *World of Tales*, offers both entertaining and educational content that can significantly benefit children. Researchers in the pedagogical field suggest that media can be used in two primary ways: educators can leverage it to achieve educational goals—such as reading literature, watching videos, or playing educational games—while children can use it to satisfy their curiosity, develop creativity, and enhance media literacy.

Innovative media in preschool education are characterized by multimedia (viewing, reading, and playing); multiplatform functionality (compatible with various devices); interactivity (allowing children to participate, share, and create content); socialization (feeling part of a community); and personalization (adjusting the experience to individual needs). This media-enhanced educational process engages multiple senses, improving children's perception and memory retention. It also supports individualized development, encourages independent learning, and satisfies creative needs, which in turn stimulates cognitive activity.

Trauma-informed education and the cultivation of digital citizenship are crucial in the context of the ongoing conflict in Ukraine. The pervasive effects of war on students' mental health necessitate educational practices that are sensitive to trauma and focused on creating safe, supportive learning environments. Trauma-informed education helps address the emotional and psychological needs of students who

may have experienced violence, displacement, or loss, thereby fostering resilience and promoting academic success. Concurrently, developing digital citizenship skills is vital in this digital age, where access to reliable information and the ability to navigate online spaces responsibly are increasingly important. As students in Ukraine engage with digital platforms, equipping them with the knowledge to discern credible sources and maintain safe online practices is essential for their well-being and informed participation in a rapidly evolving world. Together, these approaches support not only the immediate educational needs of students but also their long-term capacity to thrive amidst ongoing adversity.

Given the functional purpose of the media, it is important to study their usage features and their impact on children's mental development, informational and cognitive needs, and the formation of cognitive activity.

METHODOLOGY

The research seeks to provide a theoretical foundation, design, and validate a methodology for integrating media as a tool to enhance cognitive activity in older preschool children within the educational framework of preschool institutions. Utilizing a quantitative research approach, the study examined the progression of cognitive activity in six-year-olds and evaluated the impact of educators' media usage on this development. Data collection included a pre-test to determine baseline levels and incorporated diverse diagnostic instruments to gather relevant metrics.

Data Collection and Procedures

At the pre-test stage of the experiment, the characteristics and level of development of cognitive activity development in six-year-old children were studied, along with the ability of educators to use media to foster this quality.

The study involved 264 six-year-old children: 133 children in the experimental group (EG) and 131 children in the control group (CG). The study participants were also 26 teachers of an experimental group of preschool educational institutions whose pupils participated in experimental and pedagogical activities.

In accordance with the purpose and objectives of our study, the results of the analysis of scholarly research, and the content of the educational strand *Child in the Natural Environment* of the *State Standard of Preschool Education* (2021), the authors defined the following criteria for the development of cognitive activity: emotional-motivational, cognitive-activity, and personal-volitional.

Among the methods of pedagogical research used was the observation of various activities (cognitive, research, work, play, etc.) of six-year-old children. Additionally, diagnostic tools *Ecological Trail* (graphic dictation); *Ask and Guess* (according to P. Torrance); *Confused Lines* were used.

The generalized correlation of the levels of cognitive activity development in six-year-old children of the experimental and control groups at the pre-test stage of the experiment is presented in Table 1.

Table 1. Generalized correlation of the levels of cognitive activity development in six-year-old children of experimental and control groups (pre-test)

Groups of six-year-old children	Criteria for the development of cognitive activity in six-year-old children								
	emotional-motivational			cognitive-activity			personality-volitional		
	Levels of cognitive activity development in children of the sixth year (%)								
	high	sufficient	low	high	sufficient	low	high	sufficient	low
EG (n=133)	19	78	36	14	92	27	10	34	89
total indicator (%)	14.3	58.6	27.1	10.5	69.2	20.3	7,6	25.6	66.8
CG (n=131)	21	86	24	16	92	23	9	28	94
general indicator (%)	16.0	65.6	18.4	12,2	70,2	17.6	6,9	21.4	71,7

Source: created by the authors

The results of the study on the development of cognitive activity in six-year-old children at the pre-test stage of the experiment led to the following conclusions: according to the emotional-motivational criterion, 14.3% of children in the experimental group (EG) and 16% of children in the control group (CG) exhibited a high level. A sufficient level was observed in 58.6% of children in the EG and 65.6% of children in the CG. Meanwhile, 27.1% of children in the EG and 18.4% of children in the CG demonstrated a low level of development of the studied quality. As shown in the table, for the cognitive-activity criterion, 10.5% of children in the experimental group (EG) and 12.2% of children in the control group (CG) demonstrated a high level of cognitive activity. A sufficient level was observed in 69.2% of EG children and 70.2% of CG children, while 20.3% of EG children and 17.6% of CG children exhibited a low level. According to the results of the study on the level of development of cognitive activity within the personal-volitional component, 7.6% of children in the experimental group (EG) and 6.9% of children in the control group (CG) demonstrated a high level. A sufficient level was observed in 25.6% of EG children and 21.4% of CG children, while 66.9% of EG children and 71.7% of CG children exhibited a low level.

Based on the use of pedagogical research methods, it was found that most six-year-old children involved in the experimental and pedagogical activities exhibited an average or low level of cognitive activity. This finding confirmed the relevance of the problem under study and led to the design of the intervention.

According to Table 1, the qualitative composition of the groups exhibited minor differences. To verify the correct formation of the groups (homogeneity across all indicators and their alignment with the respective levels) and to obtain reliable data regarding the absence of significant differences between the experimental and control groups, the chi-square (χ^2) test was applied.

We formulated statistical hypotheses for the mathematical analysis of the results. The null hypothesis (H_0) posited that the level of cognitive activity development (CAD) in the control group (CG) did not significantly differ from that in the experimental group (EG) across each of the three evaluation criteria, and any observed differences between the groups were attributed to random factors. The alternative hypothesis (H_1) proposed that there were significant differences in the levels of CAD between the children in the control and experimental groups for each evaluation criterion.

To determine the empirical value of the chi-square statistic, we use the formula:

Table 2.

$$\chi_{\text{emp}}^2 = \sum \frac{(n_{i1} - \frac{n_1 \cdot n_{i1} + n_2 \cdot n_{i2}}{n_1 + n_2})^2}{\frac{n_1 \cdot n_{i1} + n_2 \cdot n_{i2}}{n_1 + n_2}}$$

where:

- χ^2 denotes the experimental chi-square statistic,
- k is the number of achievement levels (in our case, $k=3$),
- n_1 is the number of children in the control group (131),
- n_2 is the number of children in the experimental group (133),
- i represents a category of one of the achievement levels ($i=1,2,\dots,k = 1, 2, \dots$, where $k=3$),
- Σ is the sum,
- n_{i1} is the number of children in the control group falling into the i -th category,
- n_{i2} is the number of children in the experimental group falling into the i -th category.

The computed empirical chi-square value can be compared with the critical value of the chi-square statistic (χ_{cr}^2). According to the critical value table, $\chi_{cr}^2=7.8$ for a significance level $\alpha=0.05$ (the fraction of erroneous decisions that can be disregarded; thus, the probability that the characteristics of the compared groups differ is $1-\alpha=0.95$, or 95%—the level of confidence in the differences). The degrees of freedom q is 2 ($q=3$ levels of achievement - 1 = 2).

The numerical values of χ_{exp}^2 and χ_{cr}^2 for each criterion were also compared. The results of the calculations for the children according to each evaluation criterion at the pre-test stage of the experiment are presented in Table 2.

Table 3. Comparison of empirical and critical chi-square values for control and experimental groups by evaluation criteria (pre-test stage of the experiment)

Criteria	Control group	Experimental group
Emotional-Motivational	$\chi_{exp}^2 < \chi_{cr}^2 \Rightarrow 0,99 < 7,8$	$\chi_{exp}^2 < \chi_{cr}^2 \Rightarrow 0,97 < 7,8$
Cognitive-Activity	$\chi_{exp}^2 < \chi_{cr}^2 \Rightarrow 0,18 < 7,8$	$\chi_{exp}^2 < \chi_{cr}^2 \Rightarrow 0,19 < 7,8$
Personal-Volitional	$\chi_{exp}^2 < \chi_{cr}^2 \Rightarrow 0,16 < 7,8$	$\chi_{exp}^2 < \chi_{cr}^2 \Rightarrow 0,17 < 7,8$

Source: created by the authors

The results presented in Table 2 indicate that at the beginning of the formative stage of the experiment, the empirical chi-square values (χ_{exp}^2) for both the control and experimental groups were lower than the critical chi-square value (χ_{cr}^2). These statistical indicators thus support the null hypothesis.

We have sufficient grounds to accept the null hypothesis and to objectively assess the effectiveness of the experimental methodology. The analysis of experimental data using the Pearson chi-square criterion shows that, at the onset of the formative stage, there were no statistically significant differences between the control and experimental groups across all evaluated criteria, given the significance level $\alpha = 0.05$.

The results from the pre-test stage for the emotional-motivational, cognitive-activity, and personal-volitional criteria revealed a low percentage of children with a high level of cognitive activity development. This underscores the need to implement effective pedagogical conditions to enhance this quality in six-year-old children.

The results of the analysis of observations of the professional activity of educators, particularly regarding their use of media in the educational process of the preschool institution, are presented in Table 3.

Table 4. Media used by educators to form cognitive activity in six-year-old children (pre-test stage of the experiment)

No.	Media	Number
1.	Books	22
2.	Television	8
3.	Computer	10
4.	Paintings, pictures, illustrations, drawings	21
5.	Cartoons	24
6.	Presentations	7
7.	Video	11
8.	Internet	8
9.	Journals	12
10.	Personal gadgets	6
11.	Online games	9
12.	Virtual reality	4
13.	Radio	9
Total:		151

Source: created by the authors

The results of observations given in the table indicate a shortage of media in the educational activities of educators. There was no systematic, effective, pedagogically appropriate use of various media, including magazines, newspapers, radio and television programs, cartoons, paintings, pictures, illustrations, comics, virtual reality, etc. However, in the questionnaires, teachers indicated the use of television, presentations, videos, cartoons, magazines, radio, online games, etc. in the educational process.

Studies of the content of educators' perspective and calendar plans demonstrated that most educators only occasionally and haphazardly plan the use of media (most often traditional) in various activities and within different areas of the *State Standard for Preschool Education (2021)*, particularly within the educational strand *Child in the Natural Environment*. In planning media use in the educational process, we observe fragmentation and situationality. Some educators do not plan media use in the psychological and pedagogical support of forming natural and environmental competence.

Hence, the analysis of the results of the survey of teachers, observation at preschool educational institutions, as well as the study of the content of perspective, calendar plans of educational activities allow us to state the need to improve the ability of teachers to use media. The analysis of the state of the educational environment showed a lack of provision of media and their use in the educational process at preschool

educational institutions, as well as some inconsistency with the recommendations of the State Standard for Preschool Education (2021).

Study Intervention Design

During the intervention stage of the experiment, media were used during various forms of interaction between educators and children. It was unusual for children to observe natural objects using various gadgets, for example, a camera. Previously, educators using the Mozabook online service explored with children the history of the camera, its appearance and principles of operation, structure, and features of creating photographs. The teacher offered pupils the opportunity to practice the art of creating photos by searching for interesting and beautiful scenes in their environment, creating their own compositions, and placing the object in the frame, among other activities. Further, during observations at the walk, the children searched for predetermined objects and tried to take a photo of them. From the received photos, short videos were created using mobile phone applications or software such as Sony Vegas Pro, Movavi, Avidemux, Videopad Editor, etc. For example, a video titled “How Our Tulip Blossomed” was produced. The main task for the children was to notice the changes that had happened to the flower and take pictures of it. This task prompted children to observe and notice previously unnoticed things, as creating the videos required taking photos every day for one to ten days. It is worth noting that the children enthusiastically created their own photos, and also talked about what interested and surprised them in the object.

The task of creating a photo on a film camera was interesting since it has a limited number of frames. This argument was especially important for children because it was necessary to make an effort to “catch” a beautiful frame. Since the photo could not be seen immediately, the children experienced a sense of anticipation, eagerly waiting for the image to develop on the film. The resulting photographs were used in various projects, such as creating interactive posters with CartoDB and Mindomo or producing newspapers like *News from Spring*, *Events in Our Group*, and *Useful Tips for Young Gardeners*. Using Canva and Calendarum, the children made weather calendars and a nature book titled *Flowers of Our Ukraine*. Additionally, they produced videos showcasing seasonal changes, such as *Blossoming of Lilac*, *What is a Bumblebee Looking For?* and *Ant Adventures*.

Method of Simulation Using Media

During the intervention stage of the experiment, the simulation method was used by means of media. Various photos were used to create a model layout. Organizing educational interaction with children, two ways of creating models were proposed:

1) from ready-made photos on the Internet (selected or generated using neural networks (Leonardo AI, Aitubo, Lexica); 2) from those created by children using a digital camera. The study demonstrated the effectiveness of the method used.

During the intervention, educators and children created their own media images and made photo models (photo collages, photo tapes of events, photo layouts, intelligent photo maps, photo diagrams, photo lap books, etc.). For example, the photo model “Spring in the City” modelled the street of the city where the preschool educational institution was located, the adjacent streets, the pedestrian crossing to the park, trees, and flowerbeds. During the implementation of this project, the educator was able to implement the tasks of the educational program and familiarize children with changes in nature and people's lives. The photo model of the city evolved with the changing seasons throughout the year. Using photographs taken by the pupils and their parents it was utilized to simulate various problem situations and incorporated into children's play activities.

The use of media, in particular multimedia presentation and video of plant growth in an accelerated format, allowed to diversify illustrative and demonstrative material, to show the development of the plant from the beginning to full maturity in 30-40 seconds. In this way, we sparked a keen interest among preschoolers in learning about nature, considering the peculiarities of modern children's perception, who have a physical need for multimedia accompaniment.

Examples of Tasks for Children

Here is an example of an educational situation of natural content on the topic *Film Cases*, tested at the intervention stage of the experiment.

Task. Provide children with more information about the history of video clips, including the types such as story and concert videos, and discuss the unique features of video clips designed for different age groups, including adults and children. Foster children's ability to express their own opinions about the video clips they watched and cultivate a sense of tolerance and friendliness towards both the created videos and the opinions of others.

Materials: attributes for role plays, videos featuring educational situations, and equipment for creating posters.

Procedure

Preparation Interactive game *Where we were, we will not tell, and what we saw – we will show*. Role-plays *The Life of our Group: the Environment*. A creative proposal for parents: together with the children, play out the educational situation related to sustainable development and shoot a video.

Activities. Watching videos created by children with their parents. Interactive game *Voice the SMS* (which can be sent to the characters of educational situations). Creating a poster *Be Nature's Friend!* (design of visual poster with advice on the topic of preserving the Earth).

Reflection stage. Finally, children were asked reflective questions, such as “What surprised you the most today, inspired you, brought pleasure, irritated you, upset you when discussing situations /film cases?”, “What did you realize about how to treat the environment?”, “What will you tell your parents today?”, “If you have a younger sister or brother, what can you advise them after hearing and seeing today?”

Finalization stage. A suggestion for children to create different types of books for children of the fourth and fifth years of life on the topic of sustainable development: a picture book, a screen book, a box book, or a colouring book.

A suggestion for parents and children is to create a cartoon (puppet, plasticine, illustrated (using AI Animated Video Maker, Vidnoz AI, Photoleap, etc.) with a focus on sustainable development.

At the intervention stage of the experiment, the educators tested such a form of educational interaction as the creative children's television (television remake) “Reader's Mail”.

The use of media, specifically an email with audio accompaniment, greatly increased children's interest in experimentation and instilled a sense of responsibility. It focused their attention on both the process and the results, evoking emotions of joy and satisfaction from the outcomes. Preparing a joint response fostered cognitive interest in this type of interaction, promoting a desire to learn new things, formulate their own opinions, and apply their knowledge and experience in practice.

Creating an algorithm for conducting the game-strategy “Going on a Picnic” was an engaging activity, utilizing a camera or phone camera, music speakers, and an online quiz. In the course of our experimental and pedagogical activities, we observed that a wide variety of media could be used during the organization of strategy games. These games can be effectively conducted without the need for physical handouts. Educators organized such games on their own or with the help of online tools, using artificial intelligence technologies, an Internet network, cloud services or simple multimedia presentations. An integrated approach made it possible to choose the best option so that strategy games were safe, useful, interesting and met the interests of children.

Work with Educators

It is clear that the key to the successful use of contemporary media is the readiness of educators to use it in the educational process of the preschool institution. With our help and support, educators were able to incorporate media into their professional activities effectively, considering the didactic characteristics and functions of each type of media, as well as the appropriate organization of educational activities.

Recognizing that the effectiveness of fostering cognitive activity in children through media depends on the competence of educators, we organized a seminar titled *Media as a Component of the Educational Environment of a Preschool Educational Institution*. During the seminar, educators were introduced to the content of the main concepts of the research problem, the classification of media, as well as the feasibility and peculiarities of their use in the educational process.

At the pedagogical councils of experimental preschool educational institutions, a timeline of the intervention stage of the experiment was presented. Teachers got acquainted with the educational process's long-term planning and media support. During the formative experiment, educators were provided with pedagogical support for their professional activities. Consultations, practical advice, and assistance using gadgets and the Internet (various applications, platforms, sites, etc.) were provided.

Within the framework of the experiment intervention, a round table, *Digitalization of Education*, was organized and held for educators. The event aims to inform preschool education workers about the effective use of media in the upbringing and development of six-year-old children, particularly in fostering their cognitive activity. Educators were introduced to the basic principles of the digital educational environment of the kindergarten and various types of media.

At the seminar *Children and Gadgets*, educators were provided with information about the importance of using modern media in the upbringing and development of children. They were also informed about the sanitary and hygienic requirements for using digital media and were advised on useful sites and resources.

Dynamics of the Development of Cognitive Activity of Children

The study of the dynamics of the development of cognitive activity was carried out according to the same methods which were used at the pre-test stage of the experiment.

The dynamics of changes in the levels of cognitive activity in six-year-old children from the experimental and control groups at the pre-test and post-test stages of the experiment are presented in Table 4.

Table 5. Generalized correlation of the levels of cognitive activity development in six-year-old children of experimental and control groups (pre-test and post-test)

Groups of six-year-old children /Stages of the experiment	Criteria for the Development of Cognitive Activity in Six-Year-Old Children								
	emotional-motivational			cognitive-activity			personality-volitional		
	Levels of cognitive activity development in six-year-old children (%)								
	high	sufficient	low	high	sufficient	low	high	sufficient	low
EG / Pre-test	14.3	58.6	27.1	10.5	69.2	20.3	7.5	25.6	66.9
EG / Post-test	38.3	51.9	9.8	65.4	26.3	8.3	46.6	40.6	12.8
Dynamics	+24	-6.7	-17.3	+54.9	-42.9	-12	+39.1	+15	-54.1
CG / Pre-test	16.1	65.6	18.3	12.2	70.2	17.6	6.8	21.4	71.8
CG / Post-test	22.9	63.4	13.7	65.6	33.6	0.8	20.6	58	21.4
Dynamics	+6.8	-2.2	-4.6	+53.4	-36.6	-16.8	+13.8	+36.6	-50.4

The qualitative and quantitative analysis of the post-test results, employing mathematical statistical methods, demonstrates an increase in the development of cognitive activity among six-year-old children across all criteria. This analysis allows us to conclude that the experimental and pedagogical activities, which utilized various media, were effective.

Based on the overall calculations of all correlation links between indicators for each criterion, we can state the following: after the formative stage of the experiment, the number of correlations with a Spearman's rank correlation coefficient $r > 0.3$ for the emotional-motivational criterion was 11 in the control group (CG) and 18 in the experimental group (EG). For the cognitive-activity criterion, the number of correlations with $r > 0.3$ was 7 in the CG and 14 in the EG. For the personal-volitional criterion, the number of correlations with $r > 0.3$ was 7 in the CG and 14 in the EG.

Thus, the emotional-motivational criterion, which ranked highest in the characteristics of the studied indicators both in the CG and EG at the initial stage, lost its significance at the control stage. After implementing the educational program (intervention), the leading criterion in the EG, according to the correlation coefficient, became the personal-volitional criterion, which was not prominent at the initial stage. In the CG, this criterion remains negligible. However, after the implementation of the educational program, the leading indicators in the CG became those of the cognitive-activity criterion.

In conclusion, the pedagogical conditions introduced for the development of cognitive activity in six-year-old children significantly impacted the changes in the values of the studied quality, indicating their effectiveness.

The findings from observing the professional activities of educators, specifically their utilization of media in preschool educational processes, are detailed in Table 5.

Table 5. Media used by educators to form cognitive activity in six-year-old children (pre-test and post-test)

No.	Media	Number	Number
1	Books	22	26
2	Television	8	16
3	Computer	10	14
4	Paintings, pictures, illustrations, drawings	21	26
5	Cartoons	24	26
6	Presentation	7	16
7	Video	11	21
8	Internet	8	13
10	Journals	12	21
11	Personal gadgets	6	9
12	Online games	9	19
13	Virtual reality	4	7
14	Radio	9	11
15	Short movie	-	9
16	Video clips	-	16
17	Video film	-	18
18	Lap book	-	5
19	Minibook	-	15
20	Video book	-	12
21	TV reportage	-	8
22	Poster	-	11
23	Posters	-	17
Total:		151	336

As shown in the table, the observations of educators' activities during the post-test phase revealed that, based on the professional experience accumulated during the experimental and pedagogical activities, educators more frequently and appropriately began to use various media. This includes modern media, which they became more proficient in using during the intervention. The use of both traditional and modern media resulted in the development of an effective system for experimental

and pedagogical activities, which in turn contributed to an increase in the level of cognitive activity in six-year-old children.

CONCLUSION

The study demonstrates that integrating various media into the educational process of preschool institutions, supported by pedagogical interventions, enhances the cognitive activity of six-year-old children. The findings underline the importance of educators' readiness and competence in effectively utilizing both traditional and modern media tools. Educators gained proficiency in media use through professional development activities, such as seminars, consultations, and workshops, allowing them to enrich the educational environment and align it with contemporary demands.

The quantitative and qualitative analysis of the results shows substantial improvements in the experimental group across emotional-motivational, cognitive-activity, and personal-volitional criteria. Particularly notable was the shift in the experimental group, where the personal-volitional criterion emerged as a leading factor in fostering cognitive activity, contrasting with the control group, where cognitive-activity remained predominant.

Furthermore, the intervention significantly increased the frequency and diversity of media use by educators. Tools such as video clips, presentations, virtual reality, and online games were incorporated more actively, complementing traditional methods like books and illustrations. These advancements contributed to creating a comprehensive system for educational and developmental activities.

FUTURE RESEARCH DIRECTIONS

The issue of using various media in preschool education is relevant, quite complex, and insufficiently studied in both the theory and practice of preschool education. Therefore, the study cannot claim to be exhaustive. Further scientific research is needed on the content and features of using these means in various aspects of preschool children's lives to fulfill the objectives outlined in the State Standard of Preschool Education.

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KEY TERMS AND DEFINITIONS

Media Literacy: The ability to critically evaluate, analyze, and create information provided in various media formats, ensuring safe and effective media use for educational and developmental purposes.

Media Modeling Method: An instructional strategy that uses media tools and platforms to simulate real-life or conceptual scenarios, aiding in cognitive and creative development in young learners.