

From the experience of organizing artistic and productive activities of older preschool children by means of distance education in the conditions of quarantine measures for the spread of COVID-19

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Abstract. The relevance of the article relates to the need for continuing preschool education under quarantine conditions to prevent the spread of COVID-19 by means of distance technologies and preparation of children for STEAM education. Artistic and productive activities are considered to be the resource of STEAM education. The aim of the article is to substantiate educational opportunities of distance education programs for undertaking artistic and productive activities of older preschool children on quarantine. Research methods: theoretical analysis, surveys, generalization of experience, analysis of children's products, parental feedback. The scientific basis of the study is a set of approaches of different levels. Scientific novelty of the research is two-fold. The possibility of organizing artistic and productive activities of older preschool children by means of remote technologies in terms of preparing parents to interact with educators and organizational, technical, informational assistance to children. The features of the organization of such education in Ukraine under conditions of introducing quarantine measures are revealed. Practical significance is viewed through development and approbation of the content of classes on artistic and productive activities, integrated with the fundamentals of mathematics. There have been developed the questionnaires on digital competence for educators and digital literacy for parents.

Keywords: artistic and productive activities, older preschool children, distance education, COVID-19

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1. Introduction

Artistic and productive activities of older preschool children are important in terms of the development of figurative, spatial thinking, speech, visual memory. Its developmental potential is the key to quality education in primary school, the basis of the transition to logical thinking, the formation of random attention, imagination, memory, the formation of basic labor, technological and artistic skills, the development of soft skills (reflection, analysis of feelings), socialization in a team, self-expression through decoration and creation of an artistic product, independence, consumer culture, occupational safety), as well as logical and mathematical competencies (classification of geometric shapes, objects and sets by quality and quantity, ordering objects by one or more features, calculation and measurement of quantity, distance, size, length, width, height, volume, time, etc.) [31]. According to the Basic component of preschool education in Ukraine (new edition) [25], mathematical skills are an important element of a holistic perception of life. Programs for preschool children in preschool institutions of Ukraine correspond to the ideas of STEM education and promote the development of creative abilities through artistic and productive activities for the further formation of scientific thinking. Of course, the process of teaching a preschooler should take place through a play, independent work and be accompanied by positive emotions, which is the key to successful learning. Children are characterized by sensory exploration of the world, which corresponds to such types of intelligence as visual, kinesthetic and musical [19]. Over the years, the type of intelligence may change and others may develop, but the foundation is quality preschool education which is organized based on integration and opens new opportunities for child development in the education system [15]. Therefore, it is possible and appropriate to develop logical and mathematical competence of preschool children through artistic and productive activities.

Due to the introduction of quarantine measures to prevent the spread of coronavirus, there is a question of continuity of all levels of education, including preschool. Distance education has become a way to do this. Our analysis of the state of implementation of the idea of online kindergarten in Ukraine shows the dispersion and oversaturation of options for classes and topics, the misreading of the concept of distance learning. There are many questions about the content of the organization, forms and methods of teaching, the requirements for digital competence of an educator, digital literacy of parents to participate in distance preschool education. The first attempts to conduct distance learning with older preschool children revealed many problematic issues. Thus, it is impossible to formally transfer the development programs of older preschool children (target and content components) from the real educational practice into the program of online interaction of children's parents, children and educators of preschool institutions. Before the quarantine was introduced it was a preschool institution that took care of a child in the absence of parents and provided educational services within the content of the Basic component of preschool education [25], it was a responsibility of an institution to develop a well-rounded personality. In quarantine the care function was lost, educational services came to the fore, which had to be provided by means of distance education [26]. During the quarantine, the staff of preschool education were tasked to help parents organize the environment for the development of basic competencies of older preschool children in the real material living conditions of families, taking into consideration different levels of education of the child's parents. Thus, on the website of the Ministry of Education and Science of Ukraine in the letter No. 1/9-219

dated 23.04.2020 “On the organization of preschool education during quarantine” [24] preschool headmasters received recommendations: “At the time of quarantine the interaction of educators and children’s parents is important. Yes, it is recommended to hold consultations on the children’s daily routine, nutrition and activities, as well as online classes. The latter can be run in real time or sent as records. Such communication can be organized through online conferences, social networks, mobile applications, websites, etc.” [26]. These recommendations of the Ministry of Education and Science of Ukraine by means of distance education in preschool institutions define: online and offline classes, counseling children’s parents in synchronous and asynchronous mode through video conferencing, social networks, mobile applications, official websites. However, on the official website of the Ministry of Education and Science, the tab of the list of resources is not detailed and refers the site visitor to the explanatory article. To help preschool children’s parents and educators a resource has been developed with UNICEF Ukraine support. It is a global *#LearningAtHome 15 Day Challenge: Eat, Play, Love – to build your child’s brain* to teach and develop preschool children at home during COVID-19 lockdown. This resource contains information about the addresses and platforms on which exercises and tasks for preschool children are posted, some advice for parents, recommendations on conducting classes and other useful information [45]. These measures recommended and allowed, practically and methodically helped carry out mass distance education under circumstances of continuous learning and development of preschool children. Examples of implementation, a detailed description of exercises with the use of such education for preschool children are designed to help parents organize a suitable educational environment at home. But the proposed materials require a certain level of digital competence of preschool educators, digital literacy of children’s parents, determining the appropriate and possible scope of such work, justification of the proposed tasks (taking into account the degree of independence and general competencies), selection of such training, appropriate and productive forms and methods, etc. Overwhelmed with information children’s parents were forced to work remotely, they often wasted their time and efforts being dependent on the quality of technical resources. There was dispersion of content and technological aspects of counseling preschool children’s parents. The discrepancy of material and technological conditions with the realities of life of many Ukrainian families, the inconsistency of the latest achievements of modern technologies and the possibilities of average Ukrainian families have led to didactic and methodological misreadings, promptly noted by Diachenko [10], Podlasyi [33]. These misinterpretations were all about understanding the essence of the concepts of educational interaction, pedagogical interaction, pedagogical communication, educational communication, forms of learning, forms of educational interaction, forms of pedagogical communication. At present, research on the application of distance technologies, digital knowledge, new technologies and social media in the organization of all levels of education has been updated [9, 46]. The study of these materials encourages us, scholars, to substantiate and develop online resources for participants of the educational process in preschool institutions of Ukraine, including preschool children’s parents and teachers who seek to implement a program of education and training of preschool children, in particular, in terms of artistic and productive activities, logical and mathematical competence. In the context of the analysis of the problem of distance education for preschool children in the theory and practice of education, we note that prerequisite for distance learning in the world existed long before COVID-19 pandemic was along. An example of the work of Stanford University

professor Andrew Ng, who in 2011 posted a video course of Coursera lectures on YouTube, has already become a historical reference. This example is considered the beginning of distance education in the world. Overall, EdTechX Global and Global Market Insights estimate that the growth rate of the distance education services market in various industries ranges from 5% to 30% annually [21], indicating an overall increase in the readiness of teachers for distance education for such innovations. This also applies to preschool education. Thus, in the field of preschool and general secondary education, the most famous example of online educational services is considered to be K-12 program (USA), which combines the work in this direction of public and private educational establishments of different levels. This program allows each child to choose a basic course, master it and then deepen the knowledge gained through the content of other disciplines. The experience of teaching preschool children in a distance learning mode is well presented and structured by the private enterprise “Age of Learning” program “ABCmouse.com Early Learning Academy” which is designed for children aged 2 to 8 years [2]. It is worth noting that their activities are aimed at satisfying the segment of the market of online educational services. We analyzed the materials that are presented in the public domain on ABC.mouse site. They certify that the process of distance education is structured systematically and takes into account all the organizational aspects of learning. Ukraine has just now started its way to introducing such education. Learning focuses on the following subjects: reading and literature, mathematics, the surrounding world, art and color. There is an application for parents to track the child’s progress. The Concept of the Brisbane School of Distance Education (BrisbaneSDE), which includes preschool education, also speaks of the need to prepare educators and children’s parents for distance preschool education. However, children have to be at least 4 years old to be enrolled in kindergarten under the Ekindy program. All materials (paper) used in educational activities, namely: handouts, textbooks for parents and children are provided to parents at the beginning of the school year [41]. This practice testifies to the need for theoretical and methodological support of distance education of preschool children, preparation of children’s parents for such a learning format. In Ukraine, before the introduction of quarantine measures in 2020, distance education services were provided by distance schools 977 [14], “Dzherelo”, “Alternativa” [30], SEC (Scientifically Educational Establishment) “Erudit” [28], lyceum “Professional” etc. [21]. Today the project All-Ukrainian online school for secondary education is being implemented. Many educational establishments on different platforms create and design their own educational and developmental content. It should be borne in mind that distance education does not take place in a group of peers, but at home and individually. Kalogiannakis and Touvlatzis [18] is right to admit that the emotional state of children during distance learning is important for mastering disciplines and needs careful treatment and support by Tutor-Counsellor [18]. He believes that in the process of distance learning children experience both positive and negative emotions, and they require communication and support from a teacher. The modern educational process should be centered around the pedagogy of partnership, which is based on successful positively emotional interaction between teachers, parents and students [35]. Thus, through distance education as well as in artistic and productive activities children should receive positive emotionally colored communication and there has to be interaction between all the participants. Consequently, teachers have to be trained on how to provide all this, as well as they have to acquire digital competencies for distance education of preschool children. It is a responsibility of the country’s

authorities to create conditions for mastering the digital competencies of future kindergarten teachers. It is important to admit Greece's positive experience in successfully training teachers on digital skills, namely, the use of programming language ScratchJr for distance education of preschool children. This makes it possible with their financial and methodological support [32]. Other studies by Veličković and Stošić [47] also acknowledge the need to use information and communication technologies in preschool institutions. Their research proves that teachers positively react to the need to teach remotely, but they also admit the lack of appropriate digital pedagogical competencies. However, scientists, as well as governments, are making a few developments in this direction. The Government of Australia, for instance, has initiated the development of an information site, designed to support parents, teachers and children by providing various videos, electronic materials on the organization and support of distance education [3]. So, there is some foreign experience that shows the possibility of distance education preschool children.

Attempts to provide digital education to preschool children are indirectly covered in Chernyshova et al. [7], Dychkivska et al. [13]. The materials presented in these works are mainly on a combination of public, professional education (blended learning), but not full-fledged education of older preschool children at home supported by parents in promoting not only mental, but also emotional development of a child. The focus of the works by Grygorenko [16], Ivershin [17], Polovina [34], Yatsenko [51], Zhytnik [53] is studying the peculiarities of artistic and productive activities of preschool children in Ukraine. These works enable us to talk about the following important points in the selection of materials for children of this age in accordance with the educational principles of the Basic component "Child in the World of Culture": 1) Artistic and productive activities include art, music, theater, literature. 2) In the choice of means, forms of organization of artistic and productive activities should take into account the need to create a general atmosphere of friendliness, freedom of creativity, the possibility of success for each child. Note here that productive activities are typical of preschool age (children enjoy drawing, sculpting, cutting, building). These activities have a specific beneficent impact on the mental development of children. 3) Productive activities have a modeling nature. Modeling objects of the environment, the child approaches the creation of a real product, in which his idea of the object, phenomenon, situation becomes materially embodied in the picture, design, three-dimensional image. This allows us to talk about the connection between STEM education and artistic and productive activities, because "STEM is an educational practice that combines science, mathematics, engineering and technology in a formal and informal context, and it provides the child with practical opportunities for holistic understanding. of the world" [11]. However, all these works did not cover the specifics of the use of distance education for older preschool children in artistic and productive activities, which has a significant resource for extending STEAM education [39] and developing a well-rounded person.

All these problematic issues required theoretical substantiation and experimental testing of ideas, which determined the topic of our study. Our study aimed at substantiating the possibilities and features of using distance education tools for the organization of artistic and productive activities among older preschool children in Ukraine's public preschool institutions at the time of lockdown. The objectives of the research that specified the purpose of our study were: 1) to analyze theoretically the problem of distance education and digital interaction of parents and educators in preschool education institutions for the sake of children's interests, to

examine the impact of lockdown on the content of artistic activities of older preschool children; 2) to study the state of acquiring digital competence by teachers who provide the educational process in preschool education institutions in Ukraine by means of questionnaires, as well as to study parents' possibilities to organize artistic and productive activities of children using distance education; 3) to characterize the possibilities of creating a suitably safe developmental environment for children with the help of distance education, modern digital gadgets and communication technologies; 4) to identify features of organization – by means of distance education – of artistic and productive activity of older preschool children for gaining logical and mathematical competence.

2. Methodology

Research methods selected for conducting this research are the following. Theoretical analysis of scientific and pedagogical sources on the problem was done. The surveys (an original questionnaire was developed and a real questionnaire using Google form was carried out) among parents and educators of preschool education institutions were conducted. Conversations with parents and educators in order to study their opinions on the results of the survey were held. The methods of synthesis, modeling, generalization of experience for selecting the content of author's video lessons, analysis of products of children's activity were used.

To do the research, the appropriate scientific approaches were chosen. We identified necessary tools for distance learning mode under conditions of lockdown in accordance with recent research and current legal framework for education [20, 29, 42, 43, 49, 52]. These approaches include, but not limited to:

1. Philosophical: child-centeredness approach. The center of interaction between educators and parents are children, their needs, interests, development, rights; theory of human development and the theory of human rights, which ensures the development of a child on the basis of the realization of his/her rights to education, health and upbringing in the family; subject-subject approach to education where all the participants are equal subjects, the needs and problems of each must be taken into account and met with priority on the interests and rights of a child;
2. General scientific approaches: activity method. Personality qualities and skills are formed through an independent activity. Comparative approach has been used to study the experience of distance education in different regions of Ukraine as well as abroad;
3. Specific scientific approaches: psychological (facilitation, which requires not managing a child, but interaction with him/her through activation and strengthening of their activities, reinforcement of success, constructive thoughts; task-based learning) information (Gartner methodology, which is an indicator of effectiveness is reduction in number of documents and the growing number of life situations that appear online, telepathic education systems, when the signs of the pedagogical process come to the fore: interactivity of the educational process, learning as a dialogue, adaptability of educational topics, problems, tasks to life realities, flexibility of educational material, ease of reproduction, repeatability of material in distance education, reliance on the natural activity of the subject of the educational process);

4. Pedagogical approaches: competence approach. It is major constituent in education of all levels and ranges under current Ukrainian legislation. It requires digital competence of parents and educators. Androgynous approach is determined through lifelong learning for parents and caregivers. Personality-oriented approach presupposes an individual trajectory of development and education that is required for each child. Appropriate pedagogical support is provided with assistance when it is needed and this assistance should be in a form of appropriate brief counseling, which is in fact, learning through counseling. An integration approach is all about the content of classes: different areas of knowledge are arranged around the topic of child's interests, ideas, tasks of productive activity. Intensification of learning allows a child to show his/her activity and independence in learning. Peer-to-peer approach aims at better assimilation of information provided by peers. Health pedagogy implies health-preserving technologies that should be used in the educational process. An educational dialogue allows a dialogue between parents and children and the dialogue of the leaders of the class with one another to maintain the involuntary attention of children and interest in the class. Task-based learning approach is oriented for productivity. Family-centric approach views family as a special close-knit social system with its own connections, as a social institution with rights and responsibilities, as a special social group. Interaction with the child presupposes, therefore, the obligatory interaction of teachers with parents in order to create conditions for the realization of the rights and interests of a child.

To identify the digital competence of preschool teachers, we have developed a questionnaire based on the concept of digital competence of a teacher (Digital Competence Framework for Citizens, for teachers (DigCompEdu), for educational organizations (DigCompOrg) and for consumers [4, 8, 40]. There is also a list of competences necessary for the work of an educator of preschool education institution with reference to quarantine learning mode. Tasks in the realm of formation of digital skills and competencies assigned by the Ministry of Education and Science of Ukraine at the legislative level (according to the Digital Economy and Development Concept of Ukraine for 2018–2020 [1]) include the development of digital specialties in relevant curricula of specialized educational institutions; development of digital skills of citizens and modernization of preschool, general secondary, extra-curriculum and other levels of education. The issue of digital competence of pedagogical staff of preschool education institutions, their skills in distance teaching were not the subject of our study. This topic, though, was in the research interests of Chekan [6], Dyachenko [12], Soroko [38], Tymofieieva [44], whose works we analyzed while working on questionnaires. Content development of questionnaires was our own scientific contribution, however. The questionnaire did not contain a scale of lies, as it did not aim at monitoring the identification of qualities and personality traits. The questionnaire for pedagogical staff of preschool education institutions included the following questions with answer options, presented in table 1. Respondents could choose several answer options, so the total values often exceed 100%.

For parents who have children aged 5–6, we offered a questionnaire especially developed for this research to study their attitude to preschool education by means of distance technology. Our task was to outline their vision of distance learning with children, the level of children's independence, the formation of children's basic competencies, parents' willingness to offer a

child support during online classes, opportunities to provide assistance as needed, to supply children with necessary material resources. It included the questions that we have developed taking into account the ideas of child-centeredness, the concept of digital literacy of the population, the interaction of educators and children's parents for the sake of preschool children's interests (table 2).

Accomplishment of the purpose and research tasks completion considered the following factors: children's optimal workload in order to prevent fatigue, preservation of their physical health according to the requirements of Sanitary regulations for preschool educational institutions approved by the order of the Ministry of Health of Ukraine 24.03.2016 No. 234 [27]; ensuring the emotional well-being of each participant of educational interaction; setting a creative educational developmental environment based on interaction with the family to ensure a favorable emotional environment for children's development, the formation of basic digital, logical and mathematical competencies, skills of artistic and productive activities.

3. Results

We have identified the features of the use of distance education of senior preschoolers in quarantine (on the example of artistic and productive activities): if previously distance education of preschoolers was considered only through blended learning, then in quarantine is only digital education by distance learning. That requires digital pedagogical competence of educators and digital literacy of parents, the availability of gadgets, the Internet at home, online communication of educators, parents and children. Other approaches to teaching methods and selection of lesson content are needed. Traditionally, pedagogical workers are guided by thematic and calendar principles when developing work programs using elements of computer games, developing presentations or short video sessions. The idea of the digital world is to integrate knowledge into a holistic phenomenon as close as possible to the real life of the child (online classes should take into account the specifics of the family, the logic of quarantine measures, personal interests and preferences of the child and his parents, etc.). The topic of the lesson becomes a goal – you need to learn a certain piece of content needed to study the material. This approach to planning is matched by a focus on children's success and productive learning. The child becomes an active subject of pedagogical action, more precisely, interacts on equal terms and carries out its part of the work. This is an important resource for creating a favorable emotional sphere of general development. Parents are facilitators for the child and assistants in the use of funds. Features of the introduction of distance education in the organization of artistic and productive activities with older preschool children should reflect the format and content aspects of relevant for this age cognitive activity, i.e., the predominance of figurative forms of cognition of reality, such as perception, thinking, imagination, active attitude to cognition and transformation of the world, interest in the content and the process of activity, the thirst for decoration [37]. Accordingly, the mental education of the senior preschooler involves the stimulation and enrichment of figurative forms of cognitive activity. These aspects provide the benefits of multimedia (photo, video, anime) for the development of mental processes in older preschool age, the development potential of using the resources of digital gadgets, taking into account the requirements of security (digital and physical, emotional comfort, etc.). Means of distance education in working

with preschool children contribute to a gradual transition to action without reliance on a particular object (sound, smell, shape, object), to action with a symbol, a sign that replaces it, which is actually – an arsenal of information and digital communications, progression of logical and mathematical representations. The use of distance education tools allows you to go beyond the learning environment, to make accessible, visible, simple what is impossible to see with the naked eye, to simulate any situation and process. These technologies help the child to create a product, ensure its comprehensive and harmonious development through activities, gain new experiences and personal qualities. Especially important for a child of older preschool age is the opportunity to present and record their achievements. The content and level of independent activity depend on the experience of children in owning a particular activity, their life competence, the presence of developmental subject-game, natural, social environment, taking into account the own productive space of each child. This involves competent, dosed guidance from the adult, the formation of appropriate professional competencies that would implement the idea of changing the nature of the relationship of participants in the educational process contributes to the implementation of subject-subject approach in education. With the help of online classes, which have been developed by us, the teacher can become a facilitator for the child, the child's parents in joint interaction.

At the first stage of our study, a survey of pedagogical staff of preschool education in Kharkiv was conducted using the Google Forms. The survey covered 374 applicants for 3 days of activation of the questionnaire. The results provided empirical material for the development of a series of online classes for older preschoolers in the second phase of the study. The summary of the answer to the question “What is your experience in preschool education?” testified to the relative uniformity of the staff of preschool education establishments in the city. Among those interested in the problem of distance educational interaction in preschool education in Kharkiv 17.1% of respondents had experience of up to 3 years, 3–10 years 24.9% – 10–20 years, 34% – more than 30 years of teaching experience. That is, young people who actively use modern information and digital communications in everyday life are less than half of the educators of kindergartens. The results of the survey are presented in table 1.

As we aimed to identify opportunities for studying the digital competence of teachers who provide educational process for older preschoolers in preschool education institutions. The question was identified regarding the actual experience of classes aimed at developing competence of “computer literacy” which is highlighted in the Basic Component preschool education (new edition) as a variable component of a separate educational principle “Computer Literacy” which provides for the formation of informative competence of the preschooler [25] (table 1). As can be seen from table 1, the variable component has not been fully implemented in educational practice.

Difficulties, which have become a clear indicator of the low level of preparation and implementation of the idea of kindergarten online, due to the erroneous stereotypical phenomenon of the harm of using distance education for the overall development of preschool children. This explains the obvious alienation of teachers of preschool education from the problem of forming digital literacy of their own and students. We are convinced that isolated examples of the experience of using distance education tools in working with older preschoolers are due to the long-term refusal to involve children in this age group in the widespread use of distance education tools and digital e-resources. First of all, teachers and parents of preschool children

Table 1
Teachers survey results.

Question	Response option	Results
1. Your work experience in a preschool education	up to 3 years	17.1
	3-10 years	23.5
	10-20 years	24.9
	More than 20 years	34.5
2. Have you conducted computer literacy classes for preschool children?	Yes	18.3
	No	81.7
3. Where did you get knowledge of the methods of distance education for preschool children?	While studying at a pedagogical education establishment	21.7
	Self-education	56.7
	Webinars	23.8
	Trainee	1.1
	Advanced training courses, trainings, seminars of various educational establishments and NGOs	27.8
4. Would it be useful and interesting for you to attend distance learning courses for preschool children?	Yes	94.1
	No	5.9
5. Would it be useful and interesting for you to attend courses on creating developmental content using ICT for preschool children?	Yes	94.3
	No	5.7
6. Are you a confident PC and smartphone user?	Yes	56.4
	No	13.9
	It is difficult to answer	29.7
7. Would you like to work online with children during quarantine?	Yes	55.9
	No	8
	It is difficult to answer	36.1
8. Do you know how to search, find, select information that can be used for digital education of children 5–6 years?	Yes	53.2
	No	4.6
	To some extent	42.2
9. Do you have the skills to interact with children through digital technology?	Yes	25.9
	No	20.8
	To some extent	53.3
10. Do you know how to develop integrate and process digital content for children 5–6 years old?	Yes	16.5
	No	34.7
	To some extent	48.8
11. Do you know how to program?	Yes	5.8
	No	65.1
	To some extent	29.1
12. Do you have the skills to protect gadgets, personal data, and privacy?	Yes	25.1
	No	31.7
	To some extent	43.2
13. Do you know how to work with children 5–6 years old so as not to harm their health and psychological comfort?	Yes	73.3
	No	32.7
	To some extent	24
14. Do you know how to solve technical problems of your gadgets?	Yes	19.7
	No	18.7
	To some extent	61.6
15. Do you know how to use digital technologies creatively?	Yes	31.7
	No	9.6
	To some extent	58.7

were guided by the appropriate restriction of access due to the probable harm to the health and general development of the child. As a result, the issues of digital literacy and Internet safety of older preschool children were neglected, the use of digital gadgets was limited to be only a resource for entertainment and recreation. Digital gadgets were not used for activating artistic and productive activity, they did not become a resource for positive emotional development. It should be noted that such results are the consequence of misconceptions that children born in the era of digital and communication technologies do not realize the very possibility of the existence of the world and themselves in the world without gadgets. Refusal or restriction will not give a positive dynamic of the general development and the desired security. Everyone should learn to use appropriate technical innovations and capabilities of digital and communication technologies.

Careful elaboration of the research problem showed that the issue of opportunities to create a safe developmental environment for older preschool children with the help of modern digital gadgets and communication technologies is quite acute for the pedagogical community. However, during the development of the content of the questionnaire, we sought to identify the real situation of actual awareness of distance education of teachers. 13.4% were respondents who did not study and are not familiar with the sequence of creation and implementation of online classes with preschool children. This percentage is excessive for state establishments of children's preschool education. It is necessary to draw the attention of the public and representatives of the management sphere to the revealed problem. However, these figures are less than the percentage of educators with 30 years of experience. Thus, the digital competence of a kindergarten teacher can be formed regardless of the age of an educator. At the same time, self-education takes the first place in the forms of education according to the results of the questionnaire, which indicates the unevenness and inconsistency of its formation in educators. Analysis of the curriculum of the faculty of preschool education of H. S. Skovoroda Kharkiv National Pedagogical University leads to the conclusion that the digital competence of future educators is formed in the same way as in other faculties, the features of relevant education for preschool children are not taken into account.

To the question "Where did you get knowledge of the methods of organizing distance education for preschool children", 81 (21.7%) respondents indicated "while studying at a pedagogical school", "webinars" – 89 (23.8%), internships – 4 (1.1%), "self-education" – 212 (56.7%), "refresher courses" – 104 (27.8%), 50 (13.4%) respondents did get any knowledge. Understanding the multi-faceted nature of the problem of our study, the idea of developing and implementing distance learning courses for preschool children is singled out as a perspective. 94.1% of respondents were willing to support it (table 1). In the course of the research, we found that the issues of organizing distance educational interaction with the participation of older preschool children, their parents and educators are poorly represented in the market of educational services. Although scientific and methodological developments abound on the official websites of the Ministry of Education and Science of Ukraine, establishments that provide educational services, preschools, numerous forums and social groups that are initiated by teachers. However, an important point is to study the specifics of such education in quarantine with older preschool children. In particular: the level of independence of the child and the ability of parents to accompany and, if necessary, support and assist the child in the use of media transmissions; temporal compliance with the norms of the child's use of digital gadgets; the possibility of

organizing with the participation of “peer-to-peer”, when didactic instructions by children from children are perceived faster and more accurately. A similar trend persisted in the answers of teachers to the question “Would it be useful and interesting for you to attend courses on creating developmental content using distance education for preschool children?” (table 1) 94.3% of respondents strongly agreed. We consider the understanding of teachers and parents of children in the educational environment as an open information system to be important indicators of the readiness of teachers to implement the practice of using distance education for older preschool children; system knowledge of information processes, modern information models and technologies; ability to use general-purpose software to receive, process, store and transmit didactic information, use digital technologies and specialized software products in educational activities by means of distance education. This will contribute to the implementation of programs for the formation of computer literacy, technical creativity and culture in the digital world. Table 1 presents the results of the answer to the question about the level of digital literacy of educators. The amount of non-positive responses was 43.6%, which is also interpreted by us as a hidden problem of education, training through information education and the means of various disparate webinars. Insufficient awareness of the technological and procedural aspects of the use of digital technologies as a result manifested itself in the interest of teachers to work online with older preschool children (a total of negative responses was 44.1% (table 1). Also, the survey revealed insufficient awareness of teachers on the formation of the content component of online classes with older preschool children (46.8% of non-positive answers), which is confirmed by the results in table 1.

In the process of survey, we tried to identify components of pedagogical experience in organizing educational interactions with older preschool children. Experience in the use of digital technologies was indicated by 31.2% of respondents, skills of interaction with children using digital technologies were shown by 25.9% of respondents, ability to constructively form digital content, adapt it for children 5–6 years old was shown by only 16.5% of respondents (table 1). This indicates that most teachers use ready-made developments contrary to the author’s developments, where they could implement an individual approach and take into account the interests and requests of real students. Only 5.8% of respondents showed programming skills (table 1). The percentage of positive answers to the question about the ability to solve technical problems of one’s own gadgets is also low (only 19.7%) (table 1). This means that without systematic technical support, teachers will not be able to implement the tasks of distance education in the field of preschool in the future. Slightly higher rates of positive answers to questions about the possibilities of creative use of distance education, digital technologies – 31.7%. This is not enough for daily educational activities. Only 25.1% of respondents indicated digital security skills in their answers. This serious problem requires compensatory training of a wide range of teachers as soon as possible. The survey of teachers also revealed the problem of honesty of answers to the question “Do you know how to work with children 5–6 years, so as not to harm their health and psychological comfort?”. Positive answers were given by 73.3%, 24% responded “to some extent”, and the answer “no” is for 2.7%, although awareness of digital security is almost three times lower. Probably, among the interviewed teachers there is a rather vague and formal knowledge about the safe use of distance learning tools and digital gadgets. This, in our opinion, can negatively affect the creation of a favorable emotional sphere of pedagogical interaction.

We are approaching an intermediate conclusion based on the results of the first stage of a study on digital competence of teachers who provide the educational process for older preschoolers in preschool education. The real situation of actual awareness of the means and resources of distance education of teachers is actually not enough. Self-education and webinars do not provide systematic knowledge and a high level of digital competencies for distance learning. We have revealed the perspective idea of development and implementation of courses on the organization of distance learning of educators and pedagogical workers of preschool education establishments. The insufficiency of pedagogical experience in the organization of educational interactions with parents and children of senior preschool age with the use of distance education has also been established. However, the vast majority of teachers who were respondents in our studies expressed a desire to develop relevant knowledge and competencies.

The second stage of the study also included a survey of parents of older preschool children. The survey showed readiness and willingness of parents to support and promote the idea of online classes with children. This is eloquently evidenced by the results of surveys presented in table 2. (We analyzed only the responses of parents who have children aged 5–6).

The level of providing the necessary resources of the parents of Kharkiv is also fairly high (table 2): access to quality Internet – 81.4, the availability of modern gadgets – 84.1%. It was interesting to discover that parents want to give more freedom and independence to the child in preparation for classes. On the one hand, parents admitted the fact of independence of their children in the following aspects: cutting with scissors according to safety rules – 73.4%, graphic skills – 87.2%, visual skills – 75.2%, modeling skills – 70.3%. On the other hand, there is a high degree of positive answers to questions about the possibility of helping and supporting the child as needed during online classes (84.1% are willing to provide assistance during classes) (table 2). Parents were also asked to identify the degree of independence of a child, the formation of skills needed to develop a series of online classes (table 2): “yes” was the answer of 79% of respondents.

The results of the survey conducted in the second stage of the study laid down the main requirements and content for the development of the third stage of the study.

The third stage of the study involved the development of content and testing of a series of author’s online classes. Participants in the survey on a voluntary basis received links to the resources that have been developed by us and posted on the Internet series of classes with high school children using distance learning tools. This created opportunities for interaction between pedagogical staff of preschool institutions, parents in the interests of the older preschool child, the organizers of the study. If desired, children’s parents could send photo reports of online classes, their own feedback on the content and progress of classes. The children who took part in the online classes received virtual diplomas for their participation. According to the results of the questionnaire, we provided an example of pedagogical interaction of pedagogical staff of preschool education institutions, parents and older preschool children on the YouTube channel [36]. Development and testing of context and methodological content on the example of a series of 4 trial online classes on artistic and productive activities of older preschool children was aimed at implementing the author’s creative approach, the use of distance education on quarantine. At the third stage of the study it was determined that the common feature of a series of proposed classes is: semantic integration of artistic and productive activities of older preschool children and elements of mathematical literacy to provide a motivational component

Table 2

Parents survey results.

Question	Response option	Results
1. How old is your child?	5 years	43.2
	6 years	56.8
2. What kind of artistic activity does your child like?	Sculpting	56.5
	Appliqué	41.8
	Creating a picture	76.5
	Creating a variety of three-dimensional paper objects (3D modeling)	20.7
3. What technical skills does your child have?	Cutting with scissors without the help of an adult. Knows safety rules when using scissors	73.4
	Pencil. Can draw lines, geometric shapes: circle, square, triangle, rectangle	87.2
	With a brush. Can draw lines, dots, strokes	75.2
	Is able to form from plastic material (modeling clay, salt dough) various volume figures: a layer, the cylinder	70.3
4. During the quarantine period, do you consider distance learning as an opportunity for your child to consolidate knowledge and gain new ones?	Yes	73.8
	No	8.6
	Difficult to answer	17.6
5. Would you like your child to complete tasks on their own during a distance lesson?	Yes	79
	No	8.6
	I'm not interested in distance learning	12.4
6. Would you like your child to prepare for classes on their own?	Yes	39.3
	No	6.2
	To some extent	44.5
	I'm not interested in distance learning	10
7. Do you have the technical capacity for distance education?	Access the Internet	81.4
	Gadget (smartphone, tablet, laptop, computer)	84.1
	Printer	17.6
	I do not have technical appliances	2.4
	I'm not interested in distance learning	11
8. What art materials do you have?	Paints, brushes, drawing album	90
	Modeling clay, stacks	71.7
	Colored paper, scissors, glue	85.2
	Colored pencils	89.3
	A variety of materials for decoration: buttons, beads, ribbons, stickers	40.7
	I'm not interested in distance learning	10.2
9. Will you be able to help your child for the first time during classes?	Yes	84.1
	No	6.2
	I'm not interested in distance learning	9.7

of logical and mathematical competencies; tools in the context of the implementation of the semantic component of the formation of logical and mathematical competencies, the availability of materials for artistic and productive activities of children in quarantine measures given the features of providing an effective component of the formation of logical and mathematical competencies.

The topics of classes were selected in accordance with the current planning of such classes in preschool education institutions, subject to adjustment of the specifics of distance education (lack of systematic psychological, pedagogical and methodological knowledge in children's parents). Seasonality and themes of calendar holidays, simplicity of didactic tasks, categories from the sphere of children's interests are taken into account. Based on the results of the parents' questionnaire, the available materials (paints, colored pencils, paper, brushes, scissors) were chosen to prepare for online classes. A simple "Get it Done" algorithm has been developed to consolidate practical skills of cutting and constructing with paper, developing imagination and spatial thinking, mastering the concepts of geometric shapes, arranging objects in space, counting from 1 to 10 and realizing the child's natural need to decorate things. The tasks of the organizers were: to demonstrate the possibilities of online classes in creating positive emotional background, which serves as a condition for the holistic development of a child, the formation of logical and mathematical competencies and skills of artistic and productive activities; to interest children to perform tasks independently, using video lessons (material presentation in a playful way, explanation of the parity concept "peer to peer"). Topics for online classes: "Making Beach Shoes for Children", "Indian Costume", "Flowers for Mom", "Red Cat" [36].

The organizers used the recommendations of Krutii [22] on the feasibility of creating a comprehensive development environment based on the principle of unity of cognitive center, artistic and productive activities, communicative and emotional-reflexive centers, consistent with theoretical and methodological ideas of STEAM education [5]. The developed author's online classes had the following features. They last for 10–14 minutes and require minimal preparation expenses. The tasks and algorithm of their performance were demonstrated by an 11-year-old girl under teacher's guidance. This, in the opinion of the organizers of the study, helps to establish a favorable emotional background in online interaction. The tasks are simple, focused on the child's ability to perform them without the help of adults. Classes did not provide a classical structure; they were devoid of the requirements of the organization of the workplace. The developers focused on the child's interest in video lessons and minimized adult interference. The algorithm is also simple and self-explanatory. It was allowed to use alternative modern materials (finger, edible paints, instead of paintbrushes and brushes, etc.).

4. Results and discussion

The conducted classes and responses [36] of older preschool children's parents testified to their positive attitude towards such classes, the expediency of the created by the author's content and the establishment of appropriate pedagogical interaction. The children showed interest in the proposed topics and tasks, parents noted that most of the stages of the algorithm each child implemented independently. A significant number of all survey participants who took part in the survey showed an understanding on the part of teachers and parents of children

of the value of such pedagogical interaction. The proposed content of classes on artistic and productive activities clearly illustrated the value of developing the independence of a child of older preschool age, the importance of the existing stable and broad base of practical, real, obtained through various senses own experience of artistic and productive activities. The study involved an arbitrary connection between the organizers and the parents of the children (at the initiative of the latter). According to the children's parents, the information presented in the online classes through educational dialogue, peer-to-peer technology, activating children's attention through the use of fantasy elements, fairy-tale characters, elements of children's play with a soft toy – all this prompted the child to manifestation of independence under parents' facilitation. The information in this way becomes more accessible to older preschool children.

Our research and tested video materials are consistent with the ideas of STEM education [5]. We used the author's experience of modeling and educational design of artistic and productive activities, which contributes to a positive emotional background of the child's interaction with the support of parents and teachers [50]. It is important to note that the classes had an integrated content with the fundamentals of mathematics. This is our authorship innovation. The classes developed by us, having a common empirical basis, differ from the offers of video recordings of classes of the American program developed by "ABCmouse.com Early Learning Academy". We also used the idea of simple instructions, which took place in projects initiated by Learning A-Z (additional instructions, videos for parents, teachers, free access to electronic educational materials) [23]. We focused on the positive experience and the idea of additional training of parents in the direction of the required appropriate assistance to children on quarantine. At the intersection of our study, the experience of Brisbane school was updated. They developed methodological materials with a detailed description of the agenda, schedules, accompanying materials for classes with children at the time of lockdown. In the course of our research we were convinced of the expediency of laconic instructive preparation of parents to support children in artistic and productive activities by means of distance education.

In our case the content and methodological support with the use of elements of distance education was developed for the needs of time in the conditions of forced transition to urgent remote teaching. Our study is a pilot project carried out in accordance with the existing theoretical research, regulatory documentation, based on the Concept of the National Informatization Program in Ukraine [48]. Our scientific novelty was to determine the possibility of implementing distance education in artistic and productive activities on the basis of a selected set of scientific approaches of different levels for the organization of artistic and productive activities of preschoolers, which can be supplemented by systematic, comparative, methodological and organizational approaches; identification of contradictions and insufficient level of digital competence of educators, recognition of the fact of uneven logistical support of pupils' families. In Ukraine, this should be taken into account when implementing the idea of blended learning or, if necessary, continuing distance education on lockdown. As scientific novelty, we would like to single out the peculiarities of the organization of artistic and productive activities of older preschoolers with elements of distance education under conditions of quarantine measures. The practical significance of the study is: developing and testing the content of classes on artistic and productive activities, integrated with the fundamentals of mathematics; development of questionnaires on digital competence for educators and digital literacy for parents, analysis of their results.

5. Conclusions

The study found that quarantine measures to prevent the spread of coronavirus, led to the recognition of the need for distance education in Ukraine for its continuity, and also left an imprint on the use of distance education in the practice of preschool education. There was an urgent need to cover all children, their parents and educators of preschool education, there was a transition from blended learning to digital learning and online classes, creating content for interesting topics relevant to everyday life of children, organizing appropriate pedagogical interaction between teachers and parents children of senior preschool age, creation of various conditions in the field of education by the state to provide distance learning tools for all teachers, the need for advanced training of teachers of preschool establishments in the direction of digital pedagogical technologies. Preschool education in the conditions of introduction of long-term quarantine measures should ensure the child's right to education and satisfaction of his / her interests. The use of distance education for older preschoolers is a possible and appropriate, the only means of continuing education in quarantine. The means of distance education allow the child to independently select from the proposed information what is interesting to him, process information, put forward their options for its analysis, make independent decisions based on their own thoughts, their own vision of the proposed task. At the center of cognition in this case is a problem that requires the implementation of cognitive processes and independent activity. The actions of the educator are transformed into the format of the actions of the facilitator, his mission is to help the child to direct it to independent thoughts, activities, discoveries, new views on a particular phenomenon, subject, type of activity. Thus, it is possible to reach a qualitatively higher level of formation of a favorable emotional environment for the overall development of the child.

The theoretical foundations of the use of distance education in the organization of artistic and productive activities of older preschool children are a set of scientific approaches of different levels. The philosophical ones are focused on child-centeredness, human rights theory, human development theory, subject-subject approach to education. General scientific approaches embrace activity, comparative, complex methods. Specific scientific approaches include psychological: facilitation, task-based training in psychology, peer-to-peer approach, information approaches (Gartner methodology, telepathic systems). Pedagogical approaches involve competence, androgynous, family-centered, intensification of learning, personality-oriented, health pedagogy, parity "peer-to-peer" approach, educational dialogue, family-centric, pedagogical support, integration.

The interest of all pedagogical workers in the idea of using distance education for older preschool children was raised. But the condition for this should be a course to increase the level of digital competencies of teachers at preschool education institutions. Such a program should take into account their practical experience, available material resources. It was found out that self-education and the system of webinars are not effective in the role of the main source of formation of digital competencies of pedagogical staff of preschool education establishments. Thus, we can argue about the need for mandatory organization of classes for educators to improve the level of distance learning resources. A survey of parents of older preschool children showed a high degree of their interest in online preschool education. However, the study found a common problem among adults. The level of digital literacy of parents and digital

competence of educators has not yet become a priority in the list of competencies. This level is low. The organization of preschool education with the help of distance education depends on the possession of all subjects of the educational process of the necessary digital competencies.

A resource of a series of video lessons was created by us taking into account the acquired skills in children. The common feature of the series of proposed classes was: semantic integration of artistic and productive activities of older preschool children and elements of mathematical literacy, the formation of children's parents' skills of independent use of materials and tools, availability of materials for artistic and productive activities of children in quarantine. The topics of classes were selected in accordance with the current planning of such classes in preschool education institutions, subject to adjustment of the specifics of distance education (children's parents lack in systematic psychological, pedagogical and methodological knowledge). Seasonality and themes of calendar holidays, simplicity of didactic tasks, categories from the sphere of interest of children are taken into account. The tasks and the algorithm of their performance are demonstrated through the "peer to peer" approach. The developer focused on the child's interest in video lessons and minimizing adult interference. The algorithm is also simple, it did not require any clarification. It was allowed to use alternative modern materials (finger, edible paints, instead of paintbrushes, brushes, etc.).

The expected result of our work was a new quality of artistic and productive activities of older preschoolers, in particular: avoidance of the strict sequence of thematic classes, the idea of integrating the proposed topics and content of such activities, the right of parents and children to use any element lessons in any order, to change the sequence of actions, or even take only some elements that attracted the attention of the child. In this new quality of classes, we see the feasibility of using art and productive activities with older preschool children by means of distance education for the development of soft skills. The purpose of the study has been achieved; the tasks have been implemented. The study revealed the prospects for further research: formation of digital culture of teachers and digital literacy of children's parents, pedagogical culture of parents as participants in the educational process, the organization of various pedagogical interactions with children's parents.

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