

DOI: <https://doi.org/10.34069/AI/2023.72.12.3>

How to Cite:

Tsukanova, N., Kanosa, N., Hordiichuk, M., Popovych, O., & Kotelianets, N. (2023). The transformation of the training of preschool educators in the digital age. *Amazonia Investiga*, 12(72), 31-44. <https://doi.org/10.34069/AI/2023.72.12.3>



## The transformation of the training of preschool educators in the digital age

### Трансформація підготовки вихователів дошкільних закладів у цифрову епоху

Received: November 9, 2023

Accepted: December 27, 2023

Written by:

**Nataliia Tsukanova<sup>1</sup>** <https://orcid.org/0000-0002-6480-8717>**Nataliia Kanosa<sup>2</sup>** <https://orcid.org/0000-0002-3716-9112>**Mariana Hordiichuk<sup>3</sup>** <https://orcid.org/0000-0002-4263-8104>**Oksana Popovych<sup>4</sup>** <https://orcid.org/0000-0002-0321-048X>**Natalka Kotelianets<sup>5</sup>** <https://orcid.org/0000-0002-0575-5205>


#### Abstract


Nowadays, the informatization of education, the purpose of which is the use of new information technologies in the global rationalization of intellectual activity, is considered as a mandatory and absolute condition for the creation of a new information society. Therefore, we have singled out the main ways of high-quality professional training of future teachers of preschool education institutions in the modern information society. The professional training of future teachers of preschool education institutions is considered as a multifactorial structure in the modern information society and its tasks and educational components are distinguished. Four stages are distinguished and two methods of integration of professional training of future educators are characterized (horizontal and vertical). The application of the personally oriented, competence-based, integrative, activity approaches discussed in the article will provide, by the requirements of employers, a high level of


#### Анотація


Сьогодні інформатизація освіти, мета якої полягає за рахунок використання нових інформаційних технологій в глобальній раціоналізації інтелектуальної діяльності, розглядається як обов'язкова й абсолютна умова створення нового інформаційного суспільства. Тому нами виокремлено основні шляхи якісної професійної підготовки майбутніх вихователів закладів дошкільної освіти у сучасному інформаційному суспільстві. Професійну підготовку майбутніх вихователів закладів дошкільної освіти розглянуто як багатофакторну структуру в сучасному інформаційному суспільстві та виокремлено її завдання та освітні компоненти. Виділено чотири етапи та схарактеризовано два способи інтеграції професійної підготовки майбутніх вихователів (горизонтальна та вертикальна). Застосування особистісно орієнтованого, компетентнісного, інтегративного, діяльнісного підходів, що

<sup>1</sup> Candidate of Pedagogical Sciences (Ph.D.), Associate Professor, Senior Lecturer of Preschool and Elementary Education, Volodymyr Vynnychenko Central Ukrainian State University, Ukraine.  WoS Researcher ID: GRR-8182-2022

<sup>2</sup> Ph.D. in Psychology, Associate Professor, Associate Professor of the Department of Theory and Methodology of Preschool Education, Kamianets-Podilskyi National Ivan Ohienko University, Ukraine.  WoS Researcher ID: IYJ-5601-2023

<sup>3</sup> Ph.D. in Pedagogical, Associate Professor, Associate Professor of the Department of Theory and Methodology of Preschool Education, Kamianets-Podilskyi National Ivan Ohienko University, Ukraine.  WoS Researcher ID: ABG-8052-2021

<sup>4</sup> Candidate of Pedagogical Sciences, Associate Professor of the Department of Preschool and Special Education, Dean of the Faculty of Pedagogy, Mukachevo State University, Ukraine.  WoS Researcher ID: AAJ-9245-2021

<sup>5</sup> Doctor of Pedagogical Sciences, Professor of the Pre-school and Primary School Education Department, Volodymyr Vynnychenko Central Ukrainian State University, Ukraine.  WoS Researcher ID: HPF-0616-2023



training of a creative, competitive personality of the future specialist. The main technologies and factors that are effective in the modern information society are highlighted for high-quality professional training of future specialists. The importance of distance education, cloud technologies, and educational blogs is proven and the advantages of using them for the professional training of specialists are shown.

**Keywords:** professional training, future professionals, preschool education institutions, information society, informatization of education.

### Introduction

The constant dynamics of the development of modern society, the increase of scientific and professional information, the intellectualization of work, the growth of the social role of the individual, and the rapid change of technologies and techniques require higher education institutions to ensure a new high-quality level of the educational process. The main modern direction that will help fulfill such a task is the effective and wide use of modern learning technologies and information tools, particularly information and communication. The 21st century is an information society, which is formed based on socio-economic factors, signs of scientific and technological progress, and information processes.

The processes of technologization and informatization of society directly affect the educational sphere, the modernization of which requires high-quality training of competitive specialists in the link of preschool education with a high level of information and communication culture. Future educators of preschool education institutions should master innovative modern information and communication technologies, which will provide an opportunity to enrich their professional experience, and their personal and professional improvement to qualitatively realize their potential in the education of the younger generation.

Each institution of higher education faces a multifactorial, complex task related to the development and formation of a modern informational educational environment that takes into account the requirements of the social perspective. The parameters of the informational educational environment of the institution of higher education are determined by the

розглянуті у статті забезпечать, відповідно до вимог роботодавців, високий рівень підготовки творчої, конкурентоспроможної особистості майбутнього фахівця. Для якісної професійної підготовки майбутніх фахівців виділено головні технології та чинники, що є дієвими в сучасному інформаційному суспільстві. Доведено важливість дистанційної освіти, хмарних технологій, освітніх блогів та показано переваги використання їх для професійної підготовки фахівців.

**Ключові слова:** професійна підготовка, майбутні фахівці, заклади дошкільної освіти, інформаційне суспільство, інформатизація освіти.

requirements for the students who are preparing for work in the conditions of fundamental changes in society (Tymofieieva, 2017).

In modern society, the role of the teacher-educator is growing, and education, from its first level – preschool, is gaining a high status. This poses the task of increasing the requirements for the quality of the educational space, for pedagogical activities, and for the training of future specialists in preschool education. In pedagogical activity, personal and professional aspects go hand in hand. Therefore, one cannot talk about a teacher's pedagogical competence without connecting it with personality development. Therefore, the main thing in the professional training of future teachers of preschool education institutions in the modern information society is the formation of personal qualities of future specialists, the development of professional abilities, and mastering a set of professional and general cultural competencies (Anishchuk, 2020).

### Literature review

In the conditions of Ukraine's entry into the European space of higher education, the problem of convergence of educational paradigms, fundamental principles, methodological approaches in the construction of content and implementation of organizational forms, innovative technologies to ensure the quality of training of future specialists in preschool education is important.

The relevance of the chosen topic is explained by the fact that the activity of a modern preschool education institution is impossible without highly organized methodical work. The

organization of methodical work in preschool education institutions involves taking into account society's requirements for preschool education, changes in the content and technologies of development, education, and upbringing of preschool children, parents' requests, and children's needs. The study of the problems of methodical work is based on the study of historical origins, content, forms, and methods of its development.

In the domestic theory and practice of pedagogical education, a significant scientific fund has been developed, which serves as a basis for improving various aspects of professional training of educators of preschool children. Methodical advice was offered to O. Yemchyk (2022) and the prospects for the introduction of information technologies in preschool education were considered: lecture materials and the syllabus of the educational discipline were developed, and tasks and creative works for laboratory classes were presented. The possibilities are characterized, the theoretical foundations, means of using information, and computer technologies in the educational process of the preschool education institution are presented, and the algorithm for creating didactic materials using computer programs is shown.

The formation and development of various aspects of preschool education, its content, planning of the educational process, methods and forms of working with children are revealed in works N. Franchuk (2020), the peculiarities of the use of a new specific tool for the child's activity, the technical characteristics of the computer in the professional training of future teachers of preschool education institutions in the modern information society, and the ways of using educational software tools when working with children (developmental programs, didactic games, educational – game complexes, etc.); to organize the educational process of professional training of future teachers of preschool education institutions, ways of forming awareness among education seekers about the possibilities of effective use of information technologies for the use of educational tasks are shown.

Domestic scientists studied various aspects of the training of future teachers of preschool education institutions. The problems of the formation of professional training of future educators are highlighted in research by O. Lystopad, & I. Mardarova (2022). They revealed the essence of the concept of "readiness of educators to implement distance education tools in professional activity"; substantiated the

components of the readiness of future educators of preschool education institutions to implement distance education tools in their professional activities; tested and developed a step-by-step method of forming the readiness of future teachers of preschool education institutions to use distance education tools in their professional activities.

The role of teachers in the development of the preschool education system, which influenced the organizational and content principles of methodical work in preschool education institutions, is revealed in research by O. Bida, A. Chychuk, & O. Kuchai (2019). They characterized in the works of domestic and foreign scientists the state of research on the problem of studying the development of giftedness and intelligence in preschool children, proving that the problem of teaching and raising a gifted preschool child in different historical periods was constantly studied by teachers and psychologists, but certain aspects of this multifaceted issue require a more detailed understanding despite the considerable practical and theoretical heritage, primarily at present, given the relevance of the development of a gifted child of preschool age; in the works of domestic and foreign scientists, the study of the problem of studying the development of giftedness and intelligence in preschool children has been clarified. O. Sulyma (2013) proved that the formation of the readiness of future educators of preschool education institutions to implement distance education tools in their professional activities is influenced by methodological approaches: personally oriented, systemic, sociocultural, and activity.

Many scientists have always paid due attention to the research training of future preschool teachers. The problem of the formation of its various components is reflected in the works of scientists O. Naboka, & M. Demchenko (2019). They devoted their research to the professional training of future preschool teachers using electronic educational resources. T. Telychko (2022) developed and tested a program for future teachers of preschool education institutions for their psychological and pedagogical training. The main theoretical methods were used: generalization of the obtained scientific data; descriptive and analytical methods of processing critical and theoretical resources and sources; generalization and synthesis of own experience of training future specialists. In the conditions of the modernization of the education system, the principles of working with the pedagogical staff of preschool education were considered in the

format of changing the priorities of the implementation of professional training of educators. A. Anishchuk (2020), in the conditions of university education, the peculiarities of professional training of future preschool education specialists are shown. Different approaches and aspects of the development of professional and personal qualities of future specialists of the preschool education institution for professional training are highlighted. The list of competencies of the future specialist was presented, the analysis of state documents was carried out, the components of professional training were highlighted, and the principles of organizing the process of professional training of future teachers of preschool education institutions in the modern information society are substantiated.

In the scientific literature on preschool pedagogy, a significant amount has been accumulated experience that can serve as a basis for solving the research problem. O. Kovshar, N. Nedodatko, M. Baditsa, K. Suyatynova, A. Inshakov, I. Inshakova, K. Konovalova, & M. Chuloshnikova (2020) highlighted the scientific results of research into the theoretical and methodological problems of training future teachers of preschool education institutions in the modern information society using innovative, productive and interactive technologies. They showed the contribution of preschool education scientists-teachers to the development of theoretical and methodological approaches to the process of training preschool education specialists and to the results of studying childhood problems; and described ways of acquiring professional competencies by future educators. K. Shovsh, O. Bida, & A. Margitych (2022) found out the relevant professional training issues for future specialists in preschool education; showed the need for preschool education institutions for professional training of pedagogical workers; proposed the development of new approaches to the methods and technologies of professional training of future teachers of preschool education institutions in the modern information society.

Based on the analysis of the works of many scientists, we state that the state of scientific development of modern problems of preparing future teachers for the implementation of movement mode in preschool educational institutions cannot be considered satisfactory. The effort to improve the professional training of future specialists in preschool education, a thorough study and analysis of the readiness of future educators to implement the movement

regime in preschool educational institutions will contribute to overcoming the shortcomings and contradictions between:

- increasing the requirements for the professional competencies of preschool teachers provided by the basic standard and the actual state of their professional training;
- the need to improve the quality of professional training of future educators and the insufficient amount of methodical support for the educational process;
- professional training of future teachers of preschool education for the formation of media culture in older preschool children and the need to develop a system of methods and forms of the learning process.

The training of future specialists in preschool education is considered as "a multifactorial structure, the main task of which is the acquisition by each student of a personal sense of activity, the formation of professional skills, an ever-growing interest in working with children and their parents, as well as in the development of success in activities." Ways of high-quality teacher training for an innovative preschool education institution are shown; intradisciplinary and interdisciplinary integration is characterized; implementation of systemic and personal-activity approaches. The components of the professional training of a future specialist in an educational institution and the main principles of training future educators of preschool education institutions in the modern information society are highlighted; the provisions of the following approaches are defined: personally oriented; interdisciplinary; axiological; humanistic; technological; competence; activity.

**Goal.** To single out the main ways of high-quality professional training of future teachers of preschool education institutions in the modern information society.

### Methodology

An important methodological toolkit, the basis of which is a set of initial, target attitudes, conceptual ideas, psychological and technological means, methodical and psychodiagnostics, which provide a deep holistic understanding, and knowledge of the child's personality and, on its basis, harmonious development in the conditions of the education system.

To achieve the goal of the research, the following general scientific methods were used: definitive

analysis - with the aim of clarifying and revealing the conceptual and terminological apparatus of the research; theoretical - analysis, synthesis, comparison, generalization - for the purpose of systematization of methodological and scientific achievements of foreign and domestic scientists, regulatory and legislative documents; interpretative-analytical - for the purpose of analyzing documentary and literary sources; empirical - for the analysis of scientific sources, observation, identification of constructive achievements of the educational field; comparative-pedagogical analysis - for the purpose of comparing, comparing, highlighting distinctive and common features of the development of professional training of future teachers of preschool education institutions in the modern information society; prognostic - in order to theoretically generalize the possibilities of using constructive ideas of experience in the professional training of future teachers of preschool education institutions in the modern information society; retrospective analysis - to study the development and formation of professional training of future educators of preschool education institutions and to identify the specifics of its influence in the modern information society on future specialists.

The experiment is characterized by the formation of experimental and control groups. The number of students in the control group is 39, the experimental group is 87. Intuitive selection of the research object and orientation to statistical methods of description of the research object, tools, and data analysis.

Comparative data on the composition of the experimental and control groups allow us to conclude that the homogeneous indicators in these groups at the initial stage of the experiment are quite close. This confirms the correctness of the grouping and ensures the necessary purity of the experiment, validity, reliability, scientific rigor, and reliability of the obtained data.

The results of the experiment clearly indicate a noticeable increase in the results in the experimental groups compared to the control level among students. Thus, in the experimental groups, the rate of growth of the level of ensuring quality training of future educators for the design of computer exercises, didactic games for working with preschoolers, the selection of the main ways of professionalism of future educators in the modern environment was on average 150% per semester, and in the control group - 123%. In the experimental groups, by the end of the 2nd semester, the number of students whose

professionalism is at the reproductive and reproductive levels decreased by an average of 41%, and in the control group - by only 16%. On average, the number of students in the experimental groups who have a partial research level of professional development increased by 21% against 11% in the control group; the number of students engaged in professional activities at a creative level increased by 20%, while the control group practically did not change (increased by 4%).

Thus, in the experimental group, the number of students who are at a reproducible level of professionalism decreased by 65%, and in the control group - by only 35%. Before the end of the experiment, the creative level of professional training was characteristic of 47%, while only 12% of the control group. In the experimental group, the rate of increase in the level of professionalism on average per semester was 180% against 136% in the control group.

The construct validity of the study was established based on a comparison with the results. We standardized it based on a sample of the number of students.

The organization of the experiment determined the use of appropriate diagnostic tools. When choosing methods, their adequacy to the task and compliance with the criteria of validity and reliability were taken into account. Part of the methods was subject to modification, expansion of methods of processing, and interpretation of the received diagnostic material.

When creating control and experimental groups, we used varieties of the sampling method, which is a device for randomizing the elements of the experiment, it is this, taking into account unaccounted factors, that is important in ensuring the random order of research implementation. The introduction of such groups makes it possible to reduce the list of "threats" to external and internal validity and to conduct realistic measurements with the help of data collection and analysis tools over a long period of time in a natural environment (longitudinal experiments).

Qualitative and quantitative processing of the systematized collected information with the help of data collection and analysis tools was carried out using the methods of mathematical statistics. The results of the pedagogical experiment testify to the effectiveness of the pedagogical conditions and program of the experiment developed by us, which is confirmed by the positive results of the main quality indicators formed at the beginning



and at the end of the experimental work. Therefore, the positive dynamics revealed during the research give reason to believe that the set goal has been achieved.

## Results and discussion

Nowadays, the informatization of education, the purpose of which is the use of new information technologies in the global rationalization of intellectual activity, is considered as a mandatory and absolute condition for the creation of a new information society. Informatization of education is a factor that contributes to the implementation of professional training, in particular of future teachers of preschool education institutions, and state policy in the field of higher education. Information technologies have brought the impetus of innovations to the system of higher education and can be considered the main means of its innovative development (Shykula, 2013).

Considering the professional education of future teachers of preschool education institutions in the modern information society, we will highlight the application and development of information and communication technologies, and the organization of information processes, which include the following processes: organization, preservation, transfer, accumulation of data, automation, and formalization of knowledge (Bohinich, 2008).

The information space for a person's existence requires his competence in terms of formats and standards for the implementation of information programs, the information community, skills, and abilities to use information resources. In the process of this, pedagogical content and educational and developmental possibilities of semantic processing and assimilation of information are clearly revealed. However, the state of the software and technical means of higher education institutions do not always correspond to the level that satisfies the solution of the tasks facing future teachers of preschool education institutions in the modern information society (Kremen, 2003; 2005).

The implementation of information and communication technologies in the field of education is a necessary innovative process, if it allows to creation of additional opportunities and organizational and technical resources for future teachers of preschool education institutions. This means supporting active learning methods; access of future specialists to a visual form of presentation of material, a significant amount of information; support of information and communication technologies with appropriate

instrumental software; the modular principle of construction, which allows replication of individual components of information and communication technologies (Tymofieieva, 2017).

The application of integrative, competence-based, activity-oriented, and person-oriented approaches will ensure, by the requirements of employers, a high level of preparation for the creative, competitive personality of the future specialist (Anishchuk, 2020).

Today, distance education is gaining great popularity due to the transparency of the educational process, saving time, and simplifying access to educational and methodological materials (Hurevych, 2014). Distance education is a system of open educational services provided to all segments of the population in a certain country and abroad with the help of an informational educational specialized environment based on network, TV technologies, multimedia, telecommunication technologies, etc., that is, on distance learning technologies and is pedagogical. To implement distance learning in practice, specialized information systems, learning management systems, LMS, or software-pedagogical systems are used. Such information systems use sets of modules that provide full-distance learning (Polishchuk et al., 2022).

The preparation of future teachers of preschool education institutions in the modern information society for the introduction of distance education tools in their professional activities should be based on the principles. Let's highlight the main ones that contribute to the quality training of specialists (Kravchenko et al., 2022): the principle of systematicity; the principle of joint activity; the principle of relying on subjective experience; the principle of independent learning; the principle of individualization of education (Lystopad & Mardarova, 2022).

We emphasize the necessity and importance of introducing cloud technologies into the professional training of future teachers of preschool education institutions in the modern information society, which provides control and monitoring of the educational achievements of education seekers, the implementation of many types of educational activities, the openness of the educational environment, online testing, saving the funds of the higher education institutions. Their use in the educational process makes it possible to ensure equal access for teachers and students of education to quality educational resources in classes and outside classroom time

(Hurevych, 2014). "Cloud technologies" are considered to be a system of Internet resources that make it possible to use online educational libraries, media libraries, e-mail, and educational video conferences to obtain educational services; have access to educational data and materials without installing special applications on devices (Borova et al., 2021).

Let's dwell on the functions performed by the blog and which are the main ones for the professional training of future teachers of preschool education institutions in the modern information society (Shchyrbul et al., 2022).

According to S. Labudko (2013), these are the following functions: general cultural (intellectual), scientific and methodical, psychological, didactic, informational and communicative, social, and methodical. An educational blog is "a website that has a certain structure (pages) on which theoretical and practical information (articles, photo, and video materials, hyperlinks to other educational resources, presentations, surveys, assignments, etc.) are placed for teachers, students, teachers of educational institutions. The most common characteristics by which educational blogs are classified are frequency, authorship, presence of multimedia, content features, technical basis, and device type".

The advantages of using educational blogs for professional training are manifested in the following provisions:

- obtaining information does not depend on place and time – in any place where the Internet is available, the student has the opportunity to familiarize himself with the information;
- more opportunities to involve students in active interaction, which can continue during the period of study and after its completion;
- by expressing one's own opinions in writing, activating students' activities, substantiating and arguing, and defending a personal position on any problem (topic);
- involvement of teachers of preschool education institutions in the discussion of important and relevant problems (Naboka & Demchenko, 2019).

Let's highlight the main features of the key professional competencies of future educators of preschool education institutions in the modern information society. They are:

- multifunctionality: solving various problems in various spheres of social and personal life;

- multidimensionality: covering mental and intellectual processes, knowledge, creative discoveries, educational and practical skills, technologies, strategies, emotions, procedures, evaluations, etc.;
- interdisciplinarity and interdisciplinary: used in kindergarten, social sphere, family, etc.;
- sphere of personality development: development of creative, logical, critical thinking of students, self-determination, self-knowledge, self-education, and self-evaluation (Sulyma, 2013).

We conducted an experimental study to check the pedagogical conditions for training future educators to design computer exercises, and didactic games for working with preschool children, and to identify the main ways of high-quality professional training of future educators of preschool education institutions in the modern information society.

To achieve the goal of the research, the following general scientific methods were used: definitive analysis; theoretical; interpretative and analytical; empirical; comparative-pedagogical analysis; prognostic; and retrospective analysis.

Quantitative research. it is characterized by the formation of experimental and control groups, the intuitive choice of the object of research, and the orientation towards statistical methods of describing the object of research, tools, and data analysis. The introduction of such control groups makes it possible to reduce the list of "threats" to external and internal validity and to conduct realistic measurements using data collection and analysis tools over a long period of time in a natural environment (longitudinal experiments). When creating control and experimental groups, we used varieties of the sampling method, which is a device for randomizing the elements of the experiment, it is this, taking into account unaccounted factors, that is important in ensuring the random order of research implementation.

Qualitative and quantitative processing of the systematized collected information with the help of data collection and analysis tools was carried out using the methods of mathematical statistics. As a result of research and experimental work, in particular, processing the results of the study, we specified the significance of directions for increasing the effectiveness of training future educators for the design of computer exercises, didactic games for working with preschool children, highlighting the main ways of quality professional training of future educators of preschool education institutions in modern

information society. The use of a complex methodology for researching the quality of training of future educators made it possible to obtain verbal data from the participants of the experimental work, to carry out their verification using other research methods.

When conducting procedures for checking the quality of professional training of future teachers of preschool education institutions in the modern information society, the problem of obtaining a system of generalized indicators that clearly characterize the sample arises.

The indicator as a component, a constituent part of the criterion serves as a typical and specific identification of the essence of the qualities of the phenomenon or process under investigation. At the same time, those indicators that characterize the manifestation of a certain quality are dominant.

We expressed the criterion as a general characteristic of a pedagogical phenomenon or object by the formula  $P = f(a, b, c, d, e..)$ , where  $P$  is an objective quantitative measure of some phenomenon  $A$  or  $B$ ;  $a, b, c, d, e...$  - a selected number of indicators. We presented the criterion itself in the form:  $P(AB) = P(A) + P(B)$ .

When developing the criteria, we took into account such factors as the purpose and scope of the criteria (the criteria should be developed taking into account the specific goals and tasks for which they are intended), semantic certainty (each criterion should be clearly defined and unambiguously understood by all experts who will use his) and constructiveness (the features that describe the criteria must be constructively described).

The analysis of perceptions and views on the criteria required the ranking, arrangement, and systematization of indicators that have a name, meaning, and designation. Therefore, qualitative (value-verbal, non-quantitative description of the degree of manifestation of a certain quality) and quantitative (value-numerical value) indicators were taken into account.

The probability of the results of the conducted experimental work and the reliability of the experimental data are determined using the non-parametric Pearson  $\chi^2$  test, which allows you to find differences between two distributions and assess their reliability, as well as obtain the reliability of the results at 95% probability.

We suggested using cluster analysis and random sampling methods to form a sample population of research objects. Taking into account the representative sample, the random sampling method allowed us to conduct quantitative measurements of various phenomena, and pedagogical content, which are important for future teachers of preschool education institutions. This is primarily because the random sampling method allows for the selection of homogeneous groups, among which the problem under study should be investigated. The object of such conducted statistical substantiation is a set of elements characterized by uniformity, reliability, massiveness, integrity, the presence of variation (variability), and interdependence of the states of individual elements. One of the objects of study of the problem of statistical order is the contingent of graduates of institutions of higher education, namely, future teachers of preschool education institutions. The contingent of acquirers is the general population in terms of statistical analysis.

We took into account the fact that the general population differs in a significant amount, so we considered that it was inappropriate to consider the entire population and limited ourselves to the study of only part of it, but extended to the entire general population the obtained results regarding the pedagogical phenomenon of future teachers of preschool education institutions. We consider the obtained experimental data on a limited contingent of future teachers of preschool education institutions who participated in the proposed study to be a sample of the general population formed randomly since any future teacher of preschool education institutions can participate in the experiment at their own request.

The method of random selection of elements of the general population is an important method of mathematical statistics that guarantees the adequacy of a representative sample. Therefore, the representativeness of the samples is ensured by the nature of their acquisition.

In the sampling method, determining the size of the sample is the initial task, since any sample has a given size. With random sampling, there is a rule according to which each unit of the general population can fall into the sample with a certain probability. If this rule is followed, the main advantage of random sampling is realized: the elements of the general population are represented in the sample with probabilities that approach the distribution in the general population. The smaller the sign of dispersion in the general population and the larger the volume of the sample population, the smaller the error of



representativeness. Such a result is a manifestation of the law of large numbers, which allows you to calculate the required volume of the sample population based on fixed characteristics, having determined in advance the permissible error of representativeness.

The sample population was formed by the method of quota sampling, which is based on some properties of the general population (age of future teachers of preschool education institutions, their education, availability of practical work experience, and initial level of training).

Determination of the number of applicants in the experimental and control groups was carried out by the well-known provision that the more statistically homogeneous the general population is, the smaller the sample size can be. The percentage distribution based on the results of calculations, which includes at least 18 respondents, turned out to be statistically reliable and valid. Thus, the share of the sample population is 5% of the general population of future teachers of preschool education institutions.

Comparative data on the composition of the experimental and control groups allow us to conclude that the homogeneous indicators in these groups at the initial stage of the experiment are quite close. This confirms the correctness of the grouping and ensures the necessary purity of the experiment, validity, reliability, scientific rigor, and reliability of the obtained data.

Research and results ( $p < 0.05$ ) made it possible to accept the hypothesis that the level of readiness of future specialists for professional activities of the control and experimental groups does not differ.

The selective method allows you to transfer the results of selective processing to the entire general population. There is some error in this; the effectiveness of the sampling method in what allows it to be evaluated. The errors that arise when using sample data show how well the characteristics of the sample represent the corresponding characteristics of the general population and are therefore called errors of representativeness.

The magnitude of the sampling error is the difference between the population and the sample population. Sampling errors are different for each specific sample and can be generally characterized using the arithmetic average of all individual errors. In mathematical statistics, formulas have been obtained that allow you to approximately

calculate the arithmetic mean of a sample, based on the data of only the available sample.

As a result of the study, we selected four stages and two methods of integration of professional training of future educators are characterized (horizontal and vertical). The application of the personally oriented, competence-based, integrative, activity approaches discussed in the article provides, by the requirements of employers, a high level of preparation for the creative, competitive personality of the future specialist. During the research, with the aim of quality professional training of future specialists, the main technologies and factors that are effective in the modern information society were highlighted. The importance of distance education, cloud technologies, and educational blogs is proven and the advantages of using them for professional training of specialists are shown. During the experiment, the following basic pedagogical conditions for training future educators to design computer exercises and didactic games for working with preschool children were checked:

- 1) formation of positive motivation among students of higher education to use information technologies in their future professional activities;
- 2) relying on one's own life experience, skills, and knowledge acquired during methodical and technological training at a higher education institution;
- 3) development of methodical and information support for professional training of specialists for the ability to design exercises for children and computer didactic games.

To process the received data: non-parametric mathematical and statistical methods were used.

The confirmatory experiment was conducted at the initial stage of the research. As a result of its implementation, data were collected on the level of development of independence, motivation, self-organization, content-operational knowledge, abilities, and skills in the informatization of education. Further, the analysis of the obtained data made it possible to determine the ways of forming positive motivation among students of higher education for the use of information technologies in future professional activities; use of one's own life experience, and acquired knowledge during training in professional activities; design exercises for children and use computer didactic games when working with children.

The formative experiment was comparative. Pedagogical conditions were evaluated:

- at the beginning of the pedagogical experiment (diagnostic section);
- during experimental work (intermediate section);
- upon completion of the research stage (final cut).

The formative experiment took place in two stages in the natural conditions of the educational process according to the variable type, which is characterized by purposeful variation in different groups with equalized initial conditions of individual parameters that are subject to experimental research, and comparison of the final learning results.

During the first stage of the formative experiment, the effectiveness of the influence of each of the pedagogical conditions of use selected by us was checked. According to the tasks of the first stage, experimental and control groups were formed.

The identification of the main: individual and small group (based on differentiation) forms of cognitive activity of students, with auxiliary collective and frontal forms, was studied in group E1. In the E2 group, students were involved in performing creative tasks built based on increasing complexity. In the E3 group, there was a consistent increase in the proportion of students' independence. In the control group C1, students were taught within the framework of traditional education.

In the second stage of the formative experiment, we checked the validity of the selected conditions in the complex. To implement the tasks, the following experimental group (E4) was formed, in which the check was carried out: the set of conditions we selected, and one control group (C2), in which the students were trained within the framework of traditional methods.

The similarity of the groups at the initial stage of work was ensured by the close frequency of variation and the average indicator of the student's independence levels, the same technical conditions. The quality control of increasing independence in the control groups was carried out using the same means as in the experimental ones. This made it possible to ensure the objectivity of control and exclude the possibility of an error in the measurement of indicators: due to the use of different assessment tools. The number of students in the control groups – was 39 people, and in the experimental – 87 people.

The results of the experimental work allow us to assess the correctness of the assumptions made based on the theoretical analysis of the problem that is interesting to us and ensure the verification of pedagogical conditions regarding their expediency in the training of specialists.

The analysis of the results confirms the assumption that the level of professionalism in training future educators to design computer exercises, and didactic games for working with preschool children, identifying the main ways of qualitative professional training of future educators in preschool education institutions in the modern information society closely depends on motivational, meaningful – operational and self-organizing factors. A directly proportional dependence is observed in this, i.e.: a low level of professional training corresponds to low values of motivation, self-organization, and content-operational values, and vice versa, a high level of professional training corresponds to high values of motivation, self-organization, content-operational values.

During the formative experiment, we evaluated the following parameters:

- level of professional training of each student of the group;
- relative indicator of the share of students of a given level of professional training in the group;
- the average indicator of the level of professional training of the group;
- growth rates – a relative indicator characterizing the dynamics of change.

The above indicators of the evaluation of the results of the formative experiment allow us to judge the effectiveness of the process of formation of positive motivation among students of higher education for the use of information technologies in their future professional activities; use one's own life experience and acquired knowledge during training in professional activities; design exercises for children and use computer didactic games when working with children only if there is a fairly pronounced ratio of quantitative (percentage) transition of students from one level of activity to another.

The results of the first stage of the formative experiment clearly show a noticeable increase in the results in the experimental groups compared to the control level among students. Thus, in the experimental groups, the rate of increase in the level of ensuring quality training of future educators for designing computer exercises, and

didactic games for working with preschool children, highlighting the main ways of professionalism of future educators of preschool education institutions in the modern information society averaged 150% per semester, at 123% in the control group. In the experimental groups, by the end of the 2nd semester, the number of students whose professionalism is at the reproductive and reproductive levels decreased by an average of 41%, while in the control group, it changed by only 16%. On average, the number of students in the experimental groups who have a partial research level of professional development increased by 21%, compared to 11% in the control group; by 20% increased the number of students who carry out professional activities at the creative level, while in the control group, it practically did not change (increased by 4%).

Analyzing the results of the second stage of the experiment, it should be noted that positive changes in the level of professionalism of students occurred both in the experimental and control groups. This means that even within the framework of the traditional system of independent work of students, the development of professional training is taking place through the introduction of pedagogical conditions as they accumulate professional knowledge and experience in the organization of ways of forming positive motivation for students of higher education to use information technologies in their future professional activities; use one's own life experience and acquired knowledge during training in professional activities; design exercises for children and use computer didactic games when working with children.

However, this process proceeds less intensively in the control than in the experimental groups, where special conditions have been introduced that contribute to the formation of positive motivation among students for the use of information technologies in their future professional activities; use one's own life experience and acquired knowledge during training in professional activities; design exercises for children and use computer didactic games when working with children. Thus, in the experimental group, the number of students who are at a reproducible level of professionalism decreased by 65%, while in the control group, it decreased by only 35%. Before the end of the experiment, the creative level of professional training was typical for 47%, while in the control group only 12%. In the experimental group, the rate of increase in the level of professionalism averaged 180% per semester, against 136% in the control group.

Their analysis of the results shows a difference in the levels of professionalism between the students of the experimental and control groups.

So, the experimental verification of pedagogical conditions in the system of professional training of students made it possible to draw the following conclusions.

1. The research methodology included ascertaining and formative experiments.
2. As a result of conducting a confirmatory experimental study, the existence of a close relationship between the level of professionalism of students and the values of motivational, content-operational, and self-organizational indicators was established.

The formative experiment confirmed the opinion that for the effective formation of higher education students have positive motivation to use information technologies in their future professional activities; use one's own life experience and acquired knowledge during training in professional activities; design exercises for children and use computer didactic games when working with children in the system of professional training of students requires consideration of the listed pedagogical conditions. As the experiment showed, the conditions work to increase the level of professionalism of students, but a statistically significant effect is achieved only when the entire complex of selected conditions is implemented. Therefore, we recommend the proposed pedagogical conditions for use in institutions of higher education when training future educators.

## Conclusions

Nowadays, the informatization of education, the purpose of which is the use of new information technologies in the global rationalization of intellectual activity, is considered as a mandatory and absolute condition for the creation of a new information society. Therefore, we have singled out the main ways of high-quality professional training of future teachers of preschool education institutions in the modern information society.

The professional training of future teachers of preschool education institutions is considered as a multifactorial structure in the modern information society and its tasks and educational components are distinguished. Four stages are distinguished and two methods of integration of professional training of future educators are characterized (horizontal and vertical).

The application of personally oriented, competence-based, integrative, activity approaches, which are considered in the article, will ensure, by the requirements of employers, a high level of training of a creative, competitive personality of the future specialist.

The main technologies and factors that are effective in the modern information society are highlighted for high-quality professional training of future specialists.

The importance of distance education has been proven. The preparation of future teachers of preschool education institutions in the modern information society for the introduction of distance education tools in their professional activities should be based on the principles disclosed in the article.

Necessary and important in the professional training of future teachers of preschool education institutions in the modern information society are cloud technologies that provide control and monitoring of the educational achievements of education seekers, the implementation of many types of educational activities, the openness of the educational environment, online testing, and the saving of funds of higher educational institutions.

The advantages of using blogs in education compared to other electronic resources are shown. The key professional competencies of future educators of preschool education institutions in the modern information society are identified by their main characteristics.

The basic pedagogical conditions for training future educators to design computer exercises and didactic games for working with preschool children are outlined.

An experimental study was conducted to check the pedagogical conditions for training future educators to design computer exercises, and didactic games for working with preschool children, identifying the main ways of qualitative professional training of future educators of preschool education institutions in the modern information society made it possible to propose recommendations based on the results of the obtained in the conducted research.

For high-quality training of future educators to design computer exercises, and didactic games for working with preschool children, it is necessary:

1. formation of positive motivation among students to apply information technologies in their future professional activities;
2. relying on one's own life experience, skills, and knowledge acquired during methodical and technological training at a higher education institution;
3. development of methodical and information support for professional training of specialists for the ability to design exercises for children and computer didactic games.

The results of the pedagogical experiment testify to the effectiveness of the pedagogical conditions and program of the experiment developed by us, which is confirmed by the positive results of the main quality indicators formed at the beginning and at the end of the experimental work. Therefore, the positive dynamics revealed during the research give reason to believe that the set goal has been achieved.

Research and experimental work showed that to improve the professional training of future teachers of preschool education institutions, several tasks must be solved and many problems must be investigated, such as improving the qualification culture of specialists in this field.

Further research will be aimed at the possibilities of using cloud technologies, which ensure the quality and openness of the educational environment.

### Bibliographic references

- Anishchuk, A.M. (2020). Professional training of future specialists in preschool education. *Scientific notes of Mykola Gogol Nizhyn State University. Psychological and pedagogical sciences*, 4, 59-67. (In Ukrainian)
- Bida, O., Chychuk, A., & Kuchai, O. (2019). The state of research on the development of intelligence and giftedness in preschool children in the works of domestic and foreign scientists. *Mountain School of the Ukrainian Carpathians*, 20, 5-11. <http://lib.pnu.edu.ua:8080/handle/123456789/8245>
- Bohinich, O.L. (2008). Ways to improve the system of training specialists in preschool education. *Pedagogical science: history, theory, practice, development trends*, 1, 23-25. <https://acortar.link/3KrApV>
- Boichenko, M., Kozlova, T., Kulichenko, A., Shramko, R., & Polyezhayev, Y. (2022). Creative activity at higher education institutions: Ukrainian pedagogical overview. *Amazonia Investiga*, 11(59),



- 161-171.  
<https://doi.org/10.34069/AI/2022.59.11.15>
- Borova, V.E., Ilyuk, L.V., Kyrylovykh, O.F., Krasovska, O.O., Maksymchuk, N.S., Marchuk, O.O., Melnychuk, L.B., Mysko, I.P., Miskova, N.M., Pahuta, T.I., Petruk, O.M., Soyko, I.M., Khomyak, O.A., & Shkabarina, M.A. (2021). *Theory and practice of professional training of future teachers of preschool education institutions and primary schools in conditions of graduate education*. Monograph, Rivne: O. Zen, 560. <https://acortar.link/aFQz8E>
- Franchuk, N.P. (2020). Some aspects of the use of computer technologies during the training of future teachers of preschool education institutions. *Scientific journal of the NPU named after M.P. Drahomanova. Series 2. Computer-Based Learning Systems*, 22(29), 58-62.  
<https://enpuir.npu.edu.ua/handle/123456789/34393>
- Hurevych, R.S. (2014). Use of modern teaching technologies in universities. *Theory and practice of social systems management*, 2, 3-10. <https://acortar.link/qBzug6>
- Kovshar, O.V., Nedodatko, N.G., Baditsa, M.V., Suyatinova, K.E., Inshakov, A. E., Inshakova, I. E., ... & Mukoida, I.M. (2020). *Training of future specialists in preschool education using interactive and productive technologies: collective monograph*. Kryvyi Rih: KDPU, 140.  
<https://elibrary.kdpu.edu.ua/handle/123456789/4138>
- Kravchenko, T., Varga, L., Lypchanko-Kovachyk, O., Chinchoy, A., Yevtushenko, N., Syladii, I., & Kuchai, O. (2022). Improving the Professional Competence of a Specialist in Poland by Implementing Multimedia Technologies. *International Journal of Computer Science and Network Security*, 22(9), 51-58.  
<https://doi.org/10.22937/IJCSNS.2022.22.9.8>
- Kremen, V.H. (2003). *Education and science of Ukraine: ways of modernization. Facts, thoughts, perspectives*. Kyiv: Gramota, 216. ISBN 966-8066-12-X
- Kremen, V.H. (2005). *Education and science in Ukraine – innovative aspects. Strategy. Realization. Results*, Kyiv: Gramota, 448.  
<https://acortar.link/pDKeVh>
- Labudko, S.P. (2013). Blog as a means of developing teachers' professional competence". *Computer in school and family*, 6, 9-12. <https://acortar.link/5ynbDz>
- Lystopad, O., & Mardarova, I. (2022). Preparation of educators for the introduction of distance education tools in professional activities. *Scientific Bulletin of Izmail State Humanitarian University*, 60, 99-111.  
<http://visnyk.idgu.edu.ua/index.php/nv/article/view/661>
- Naboka, O., & Demchenko, M. (2019). Educational blog as a tool for professional training of future teachers of preschool education institutions. *Information technologies and teaching aids*, 69(1), 64-77.  
<https://acortar.link/mfgA1n>
- Polishchuk, G., Khlystun, I., Zarudniak, N., Mukoviz, O., Motsyk, R., Havrylenko, O., & Kuchai, O. (2022). Providing the Practical Component of the Future Specialist with Multimedia Technologies in the Educational Process of Higher Education. *International Journal of Computer Science and Network Security*, 22(9), 714-720.  
<https://doi.org/10.22937/IJCSNS.2022.22.9.93>
- Shchyrbul, O., Babalich, V., Mishyn, S., Novikova, V., Zinchenko, L., Haidamashko, I., & Kuchai, O. (2022). Conceptual Approaches to Training Specialists Using Multimedia Technologies. *International Journal of Computer Science and Network Security*, 22(9), 123-130.  
<https://doi.org/10.22937/IJCSNS.2022.22.9.19>
- Shovsh, K.S., Bida, O.A., & Margitych, A.I. (2022). Features of professional training of future preschool education specialists. *Proceedings. Series: Pedagogical sciences*, 207, 376-380.  
<https://pednauk.cuspu.edu.ua/index.php/pednauk/article/view/1489>
- Shykula, H. (2013). Development of information technologies in universities of Ukraine: historical aspect. *Problems and prospects of the sciences in globalization: Materials of the 9th All-Ukrainian Scientific Conference* (November 18-22, 2013). 53-56.  
<https://acortar.link/mnFwTp>
- Sulyma, O.V. (2013). *A competent approach to the training of teaching staff for preschool institutions of the Federal Republic of Germany*. Methodological recommendations. Kyiv: Institute of Pedagogical Education and Adult Education of the National Academy of Sciences of Ukraine, 48.
- Telychko, T. (2022). Professional training of future preschool teachers: psychological and pedagogical aspect. *Scientific Bulletin of Uzhhorod University. Series: Pedagogy. Social Work*, 2(51), 171-174. <http://visnyk-ped.uzhnu.edu.ua/article/view/267716>
- Tymofieieva, I.B. (2017). *Formation of information and communication competence*

*of future teachers of preschool educational institutions.* (Dissertation for obtaining the scientific degree of Candidate of Pedagogical Sciences) Institute of Educational Problems, Kyiv, 254.  
[https://lib.iitta.gov.ua/710013/1/Timofeieva\\_dis.pdf](https://lib.iitta.gov.ua/710013/1/Timofeieva_dis.pdf)

Yemchyk, O.H. (2022). *Information technologies in preschool education: educational and methodological manual.* Lutsk: Lesya Ukrainka Volyn National University, 200.  
<https://evnuir.vnu.edu.ua/handle/123456789/21514>

