

Training of Future Teachers for Work with Preschoolers under Martial Law in Ukraine

Larysa Zdanevych^{1,*}, Tetiana Tsehelnik¹, Kateryna Kruty², Olha Reipolska³, Iryna Uliukaieva⁴ & Nadiia Frolenkova¹

¹Department of Pre-School Pedagogy, Psychology and Professional Methods, Faculty of Pre-School Education and Psychology, Khmelnytskyi Humanitarian-Pedagogical Academy, Khmelnytskyi, Ukraine

²Department of Preschool Education, Faculty of Pre-school and Primary Education after Valentina Voloshina, Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, Vinnytsia, Ukraine

³Institute of Problems on Education of the National Academy of Educational Sciences of Ukraine, Kyiv, Ukraine

⁴Department of Preschool Education, Faculty of preschool, special and social education, Berdyansk State Pedagogical University, Zaporizhzhia, Ukraine

*Correspondence: Department of pre-school pedagogy, psychology and professional methods, Faculty of pre-school education and psychology, Khmelnytskyi Humanitarian-Pedagogical Academy, 139, Proskurivskoho pidpillia Str., Khmelnytskyi, 29000, Ukraine

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Abstract

The article is aimed to check the effectiveness of the formation of professional competencies of future specialists in preschool education facilities under martial law. A structural-functional model was chosen as an experimental model of competence formation. Methods. The paper used interviewing and testing techniques, the method of expert analysis of students' educational achievements. To identify the psychological characteristics of students' educational motivation, we used the method for studying the motivation of learning at a university by T. I. Ilyina. The Welch's t-test and Student's t-test were used to comparing the levels. The results. Professional motives began to dominate in the majority of students (24%) after the end of the first stage of the experiment and the number of students who have formed professional competences increased significantly at the end of the experiment (4.8). It has been proven that the motivational-value component (2,8) plays a key role in the structure of the student's professional competence. The results of the experiment allow us to conclude improvement of the levels of formation of future educators' professional competence. The creative component showed special dynamics (58%). Conclusions. Despite the state of war, the structural-functional model demonstrates positive results in the formation of professional competencies. Prospects for further research should focus on the effective methods of organizing the educational process in wartime.

Keywords: teacher training, structural-functional model, professional competences, preschool education

1. Introduction

The relevance of the study is due to the need to identify the features of preschool teachers' training under martial law. After the full-scale invasion of Ukraine by the Russian Federation and the announcement by the President of the legal regime of martial law, there arose the problem of organizing the training of future specialists. Training of educational workers in preschool educational institutions is particularly important (Lakhtionova & Trush, 2022).

With new conditions, the education system is in the modernization process, and all the processes taking place here equally apply to all levels of the education system – from early childhood education to higher professional education. And, if for secondary and professional education the changes of the last decade were a continuation of previous reforms, the period of changes started in preschool education already in the 21st century (Kononko, 2018).

Formal signs of reforming the system of preschool education are new normative documents that change the legal, administrative, and economic conditions enabling modernization of all levels of preschool education. These questions became especially relevant in wartime. Right now, there is growing interest in the use of new educational

forms that allow preschool institutions to find their format of relationship with the environment (Illiashenko et al., 2022). Today, preschool education institutions face the issue of ensuring safety for both teaching staff and pupils. That is why new demands are placed on future preschool teachers – the ability to provide a safe environment for themselves and their pupils (Trubavina et al., 2022).

The successful professional activity of a preschool teacher is related to his personal and professional development. Working with pre-school children requires constant self-education, improvement of professional skills, search for new forms of interaction with children, and exchange of experience with colleagues. The highest degree of professional development is creative professional activity (Yuzyk et al., 2022). Work in preschool education requires simultaneous professional and personal development since interaction with preschool children is based on the teacher's creativity and improvisation. In wartime, the training of a future specialist relates to the mastery of modern technologies and teaching tools, finding and implementing new forms of work with children (Enochsson & Ribaeus, 2021).

From the psychological point of view, the future teacher's professional development is a complex process determined by social factors and individual and psychological peculiarities of a person. The psychological approach considers not a rare phenomenon related only to professional activity, but a complex phenomenon of personal and professional development that describes and characterizes various stages, and crises of professional development (Isaieva et al., 2020; Sepúlveda, 2020). Professional development is inseparable from personal development – both are based on the principle of self-development of a person's ability to transform his own life into a subject of practical transformation, which leads to the highest form of human activity – creative self-realization. Both concepts are connected, but as processes, they have different outcomes (World Health Organization, 2019).

Professional development is increasing professional knowledge and skills for the effective performance of professional duties. Personality realization in independent work and lifestyle change are the results of personal and professional development (Mertala, 2019). It should be emphasized that personal and professional development is related to the change of personal qualities when mastering professional activities, while professional development is the process of a person's self-development in a profession. Professional and personal-professional development are closely related, but based on the direction of our research, we will rely on the component composition of these phenomena (European Commission, 2019).

In general, in pedagogy, the age limits of preschool education are from 2 months to 7 years. However, if we take into consideration state administration of preschool education, then the age limits include children who can attend children's educational institutions – on average from 2 to 7 years old. (Marchuk et al., 2021).

The main function of the preschool education system is the formation and development of a harmonious personality, socially adapted and ready for further education. The main tasks of preschool education are the following:

- Protection of children's lives.
- Promotion of physical and mental health.
- Cognitive and speech development, social-personal, artistic-aesthetic, and physical development of a child.
- Education of the individual by age characteristics.
- Joint activity with the family on the upbringing and development of the child's personality.
- If necessary – correction of deficiencies in physical and mental development.
- Professional counseling of parents on any issues of upbringing, development, and education of children (Ivershyn et al., 2022).

Based on the conducted analysis and the real-life education system in the conditions of the experiment, a structural and functional model was chosen. It was considered an integrated system, consisting of target, content, procedural, control, and assessment blocks, interconnected with each other. A structural-functional model was perceived as a set of functionally related components which reveal the internal organization (structure) of the process of forming students' sociocultural competence and are responsible for the adequate recreation of the interaction between the elements of this process (Makhmudova, 2022).

1.1 Unexamined Issues

Despite the study of issues related to the training of preschool teachers, the problem of professional development under wartime conditions has not been researched yet. Moreover, the theoretical and methodological foundations of the organization of this type of pedagogical activity are underdeveloped.

The purpose of the study is to check the effectiveness of the structural-functional model of training future preschool teachers for the acquisition of professional competences in wartime conditions.

1.2 Tasks/Questions

1. To check the effectiveness of the structural and functional model of training future specialists in preschool education institutions.
2. To investigate the formation of professional competencies in future teachers in times of war.

2. Literature Review

Pedagogical science has accumulated a system of knowledge about the peculiarities of teacher training for working with preschoolers. The process of development in a specially organized environment was described in the works of Ilnitska and Mykolaiko (2022). The authors analyzed the historical aspects of the organization of the developing environment of educational institutions. The pedagogy of the educational environment was also reflected in the work of Illiashenko et al. (2022). In the construction of a developing environment, modern preschool pedagogy focuses on the personality-oriented model of interaction with children. The role of the subject space in child development was examined in the works of Yuzyk et al. (2022), who discussed the scientific and psychological foundations of developmental education and the organization of a developing environment as an integral part of such a system. Trubavina et al. (2020) also worked in this direction. There are different concepts of building the subject space, based on a special approach to the component composition and the principle of filling, as well as teaching aids aimed at specifying the requirements of the educational standard for the subject space of a preschool organization. Modern researchers consider the developing environment of a kindergarten in the context of developing methods for assessing the quality of preschool education for its further improvement. The developing object-spatial environment as an indicator of the quality of preschool education was presented by Sizintsova (2022). The involvement of young teachers in the generalization and dissemination of the positive experience of colleagues was addressed in the work of Mangel et al., (2019). Mertala (2019) and Forsling (2019) believe that mastering modern digital technologies plays an important role in training a future preschool teacher. General problems of preschool education were discussed in the work of Makhmudova (2022). Forsling (2021) gave a general description of preschool age, enabling us to form an idea of the challenges and risks that a future preschool teacher may face, especially during martial law.

Productivity of these developments is largely ensured by the achievement of the continuity of perspective and retrospect in the implementation of complex of research on the relevant issues.

There's also an acute problem related to the need to find the optimal development of the modern system of preschool education in specific socio-economic, demographic, geopolitical, and ecological regional conditions. This should be especially taken into account in the process of determining directions and ways of improving the training of personnel for pre-school education institutions. In this regard, a large amount of research work is currently being conducted on various aspects of improving the system of training preschool teachers.

3. Methods

3.1 Research Procedure

The experimental work took place in three stages.

The first – ascertaining – stage of the experiment (March 2022) included:

- the study of the formation process of training future preschool teachers;
- analysis of factors that can reflect the effectiveness of training models for future preschool teachers;
- preparation for research.

The second – formative – stage of the pedagogical experiment (April-May 2022) included:

- development of the Program of the Experiment;
- implementation of the structural-functional model of formation of professional competence of students of the pedagogical HEIs in wartime;
- control throughout the pedagogical experiment using applied research methods;
- analysis and processing of the results, obtained during the experiment and summarizing the results of the pedagogical experiment.

The third and final stage of the pedagogical experiment (June 2022) included the systematization and generalization of the experimental results, formulation of the findings of the study, and prospects for further work.

3.2 Sampling Design

The research used cluster sampling, which involves the selection of several courses from the total population, within which the survey was conducted by continuous sampling. The number of respondents in these courses should ensure the representativeness of the sample population.

160 students of the 3rd and 4th courses of the specialties “Preschool Education” and “Correctional Pedagogy” of Borys Grinchenko Kyiv University took part in the experiment. Respondents were chosen randomly by drawing lots. This number of respondents makes it possible to investigate the issue more objectively. 20 experts – teachers of Borys Grinchenko Kyiv University also took part in the experiment.

All respondents were asked in advance to answer the questions honestly and independently. The respondents themselves, as well as the questionnaires used, were imposed ethical requirements of integrity, respect to the personality, scientificity, and anonymity when answering questions, for which the personal data of each respondent was encrypted. In this way, we managed to achieve the most truthful answers. The objectivity and impartiality of the research results are unquestionable.

They answered the questions of a remote questionnaire in Google Forms. The main limitation of the study is the finite number of respondents who would meet the sampling conditions; conducting research among the students of one HEI, which does not question the reliability of the results obtained because the sample was formed in such a way as to cover all strata of students studying in an average HEI of Ukraine.

3.3 Methods

1. Interviewing and testing methods were used in the work. Special attention was paid to the method of expert analysis of students’ academic performance (Turner et al., 2017). Determination of the final level of formation of the general pedagogical and subject-pedagogical components of the future teachers’ professional competence was carried out according to the method of expert evaluations. Three levels were distinguished for each criterion: low (1 point), medium (2 points), and high (3 points). To determine the final level of formation of professional competence, the sum of points for four components was calculated. Depending on the number of points scored, students were divided into groups corresponding to three levels of formation of future teachers’ professional competence: reproductive, productive, and creative.

2. To identify the psychological features of students’ educational motivation, we used the method for studying the motivation of learning at a university by T. I. Ilyina (Yesipova, 2019). The methodology includes three scales: “Acquisition of knowledge”, “Receiving a diploma” and “Mastering the profession”.

3. The Welch's t-test, and Student's t-test were used to compare the levels (Roldan, 2021):

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \quad (1)$$

Here, X_1 and X_2 denote the samples. n_1 is the number of listeners at the input control, n_2 is the number of listeners at the final control, and s means the root-mean-square error (RMSE).

$$s_x = \sqrt{\frac{1}{(n-1)n} \sum_{i=1}^n (x - x_i)^2} \quad (2)$$

Therefore, H_0 (null hypothesis): the level of knowledge and skills of future preschool teachers did not increase after the implementation of the structural-functional model of future teachers’ competence formation of during the war. H_1 (alternative hypothesis): the level of knowledge and skills of future preschool teachers increased after the implementation of the structural-functional model of future teachers’ competence formation during the war.

Google Forms were used for the survey and data entry and processing were carried out with the help of “SPSS Statistics 16.0”. All data are given in relative (% of those questioned) values. The credibility and scientific soundness of the research were ensured by the correct set of methods, corresponding to the objectives and purpose of the study, by the methodological justification of provisions, by the comprehensive use of theoretical, empirical, and statistical methods, by the approbation and implementation of the main research results and by practical work in the higher education system.

4. Results

Evaluation of the educational motivation of students-future preschool teachers was carried out at the initial and final stages of the educational experiment. The results of the analysis of students' answers are presented in Figure 1.

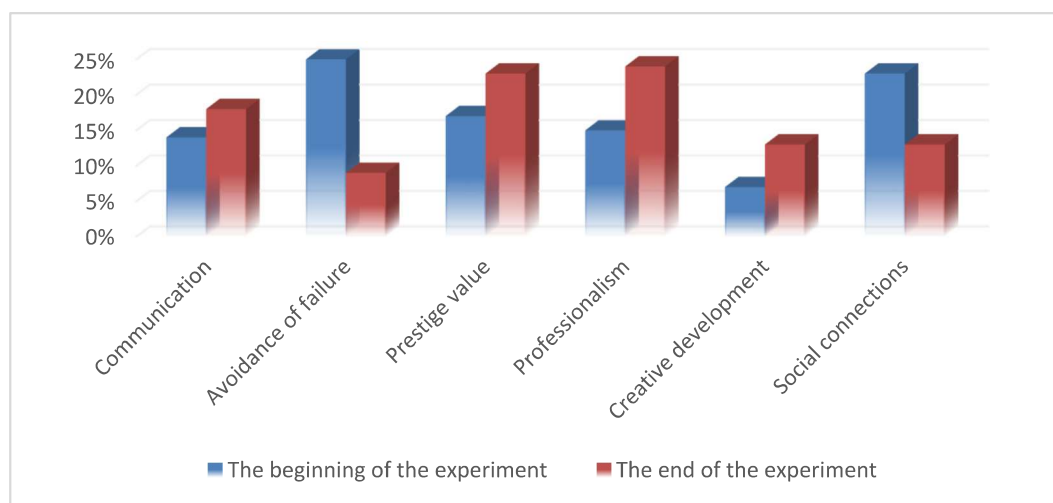


Figure 1. Diagnostics of the Students' Educational Motivation

Source: Compiled by the authors based on research results

The analysis of the obtained results showed that after the end of the initial stage of the experiment, professional motives began to dominate in the majority of students. We also observed positive dynamics of changes in the motives of prestige value and broad social motives for work in preschool education institutions, as well as creative self-realization in a professional environment. We can also point out the negative dynamics of motives for avoiding failure. Fig. 2 shows the performance of the expert group. The histogram reflects the level of formation of theoretical knowledge and practical skills in the work of a preschool teacher.

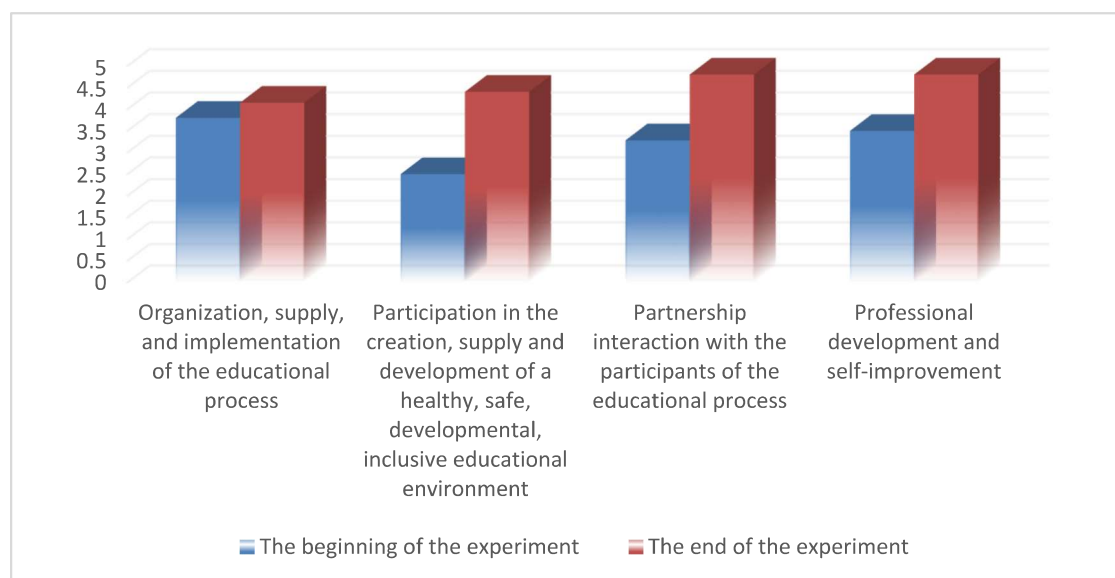


Figure 2. Diagnostics of Students' Formation of Theoretical Knowledge and Practical Skills Based on a 5-point Grading Scale

Source: Compiled by the authors based on research results

The analysis of the received data showed that the number of students who have developed professional competences significantly increased at the end of the experiment. The assessment of the level of formation of theoretical knowledge and practical skills was carried out based on the analysis of the educational achievements of the respondents.

According to the content of the hypotheses, a one-sided sign test should be applied: $P(x_i < y_i) \leq P(x_i > y_i)$; H_1 : $P(x_i > y_i) > 0.5$. Let us calculate the value of the statistics of the criterion T, which is equal to the number of positive differences in marks obtained by students. To determine the critical values of the statistics of the n-ta criterion, we will use the generally accepted values of the sign test statistics, since $n - n_{\alpha} (22 > 19)$. Therefore, the null hypothesis is rejected at the test's significance level of 0.5 and an alternative hypothesis is accepted, which allows us to conclude the effectiveness of the structural-functional model of competence formation in students of pedagogical higher education.

For each student, the total number of points scored by him for each criterion was calculated based on the relevant diagnostic methods. Taking into account the values of 1 point of the scale, the position of the diagram of the formation level of a specific component of competence was determined using a proportion. Next, the average value of the formation level of each competence component was determined for all respondents. The results of the study are shown in Figure 3.

The results of the experiment showed that the motivational and value component plays a leading role in the structure of the student's professional competence. The level of its formation will help increase the level and other components of professional competence. Also, the greatest dynamics are observed at the level of formation of the subject-professional component. Identification of the level of formation of future preschool teachers' professional competence was carried out based on the analysis of current and intermediate control. Figure 4 presents the results of determining the levels of formation of future preschool teachers' professional competence.

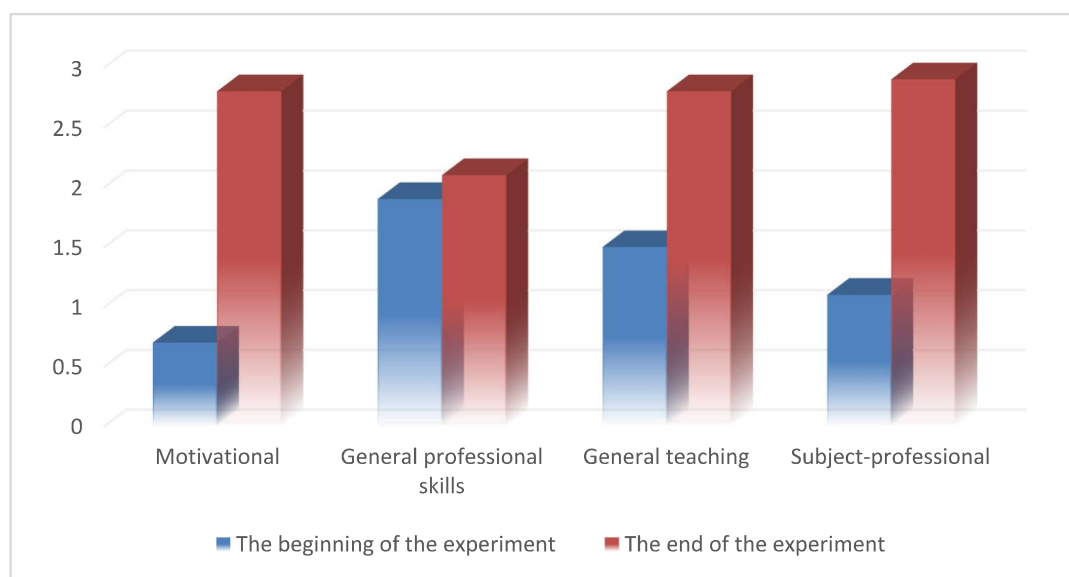


Figure 3. Dynamics of the Levels of Competence Components' Formation of Future Preschool Teachers

Source: Compiled by the authors based on research results

The results of the experiment allow us to conclude the positive dynamics of the levels of the future educators' professional competence formation. Thus, the results of the experimental verification of the implementation of the structural-functional model of the formation of professional competence of students of pedagogical HEIs confirm the effectiveness of the developed model and prove its influence on the positive change in the levels of formation of the professional competence components, which confirm the research hypothesis.

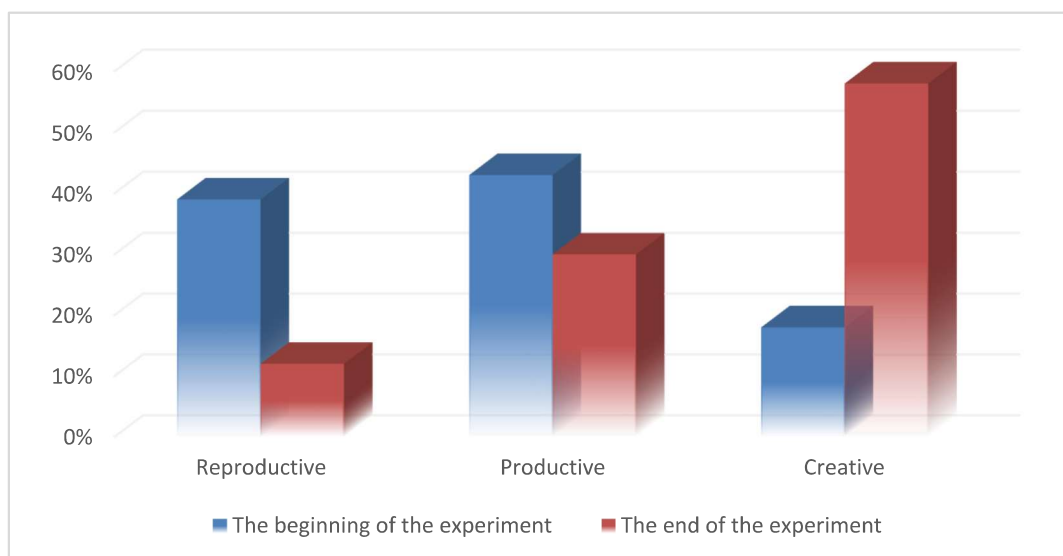


Figure 4. Dynamics of Competence Formation of Future Preschool Teachers

Source: Compiled by the authors based on research results

At the end of the formative experiment, final diagnostics were run using the same methods as at the ascertaining stage of the study. The comparative results are summarized in Table 1. The final stage of research and experimental work included a comparison of the results, obtained at the ascertaining and formative stages, statistical processing, and analysis of the obtained data. The data obtained as a result of the input and final control showed an increase in the level of development of the future teachers' professional competence (for each of the 4 competences: regulatory, general cultural, pedagogical, and communicative competences).

Table 1. Comparison of Distributions of the Development Level of the Teachers' Professional Competence in the Control and Experimental Groups

Group	Primary control	Final control	t-test
REGULATORY COMPETENCE			
ЕГ	0,58	0,79	8,54
КГ	0,63	0,66	0,30
GENERAL CULTURAL COMPETENCE			
ЕГ	0,59	0,74	3,26
КГ	0,70	0,72	1,23
PEDAGOGICAL COMPETENCE			
ЕГ	0,43	0,73	13,57
КГ	0,47	0,49	0,41
COMMUNICATIVE COMPETENCE			
ЕГ	0,34	0,53	7,43
КГ	0,38	0,41	0,61

Table 1 shows the results of the study for the experimental and control groups at the beginning and the end of the experiment. Each respondent was tested on the regulatory, general cultural, pedagogical, and communicative competences. These results were then put into a single scale, where the unit is the best possible test result.

Accordingly, each result in a single scale is the ratio of the number of points received by the respondent to the maximum possible number of points. Thus, the score on the unified scale is a percentage of the maximum score obtained by the listener. Then, the results of each test were averaged across respondents to get a portrait of the “average respondent” in terms of expressiveness of one or another competency. The initial test results were obtained and averaged in a completely similar way. The level of significance indicates the accuracy of the test; the smaller it is, the greater the probability with which the hypothesis being tested is realized. The lowest significance level corresponds to greater accuracy. The number of degrees of freedom is calculated as $n + m - 2$ for two samples of sizes n and m . From these two parameters, the critical value is found in the table.

For a significance level of 0.05, it is equal to 1.98. The value of the t-test is shown in the fourth column of Table 1. To check whether the samples show a difference with a probability of 95%, it is necessary to compare the value of the criterion with the critical one. The values of the t-test indicate that in the control group the difference between the results of the initial and final control is quite small since the corresponding values of the t-test are significantly less than the critical value (1.98). On the contrary, for the experimental group, the differences are statistically significant, since the value of the t-test greatly exceeds the critical one, so we can claim that the data of the final control showed an increase in the level of development of teachers’ cultural competence (for each of the 4 competencies: regulatory (by 0.21), general cultural (by 0.15), pedagogical (by 0.31), communicative (by 0.19).

5. Discussion

The successful professional activity of the future preschool teacher is connected with his personal and professional development, especially during the war. Working with preschoolers requires constant self-education, improvement of professional skills, search for new forms of interaction with children, and exchange of experience with colleagues, which contributes to the teacher’s personality changes. Such researchers as Abdullahi et al. (2019) and Magen-Nagar & Firstater (2019) note in their works the need for continuous improvement. Researchers consider professional excellence to be the highest degree of professional development. At the same time, such researchers as Lindeman et al., (2021) single out a creative approach to the use of modern technologies in everyday work as the highest form of professional development.

The work in preschool education determines the importance of simultaneous professional and personal development processes. This determines the interaction with preschoolers on the teacher’s creativity and improvisation. Such trends of professional formation were mentioned by Ahadovna and Erkinovna (2022). The future teacher’s need for self-expression, the need for emotional communication with preschoolers and their parents, and even supporting interest in work are related to the process of personal development. The organization of a future teacher’s personal development during the war becomes a difficult challenge for the system of higher pedagogical education. This topic was investigated in the works of Case & Law (2022) and Sizintsova (2022). Mastering modern technologies and teaching aids by a future teacher was studied by such researchers as Dong (2018) and Trubavina et al. (2020). Ilnitska and Mykolaiko (2022), determine the main provisions of the organization of distance pedagogical education in times of war. However, such authors as Demchenko (2018) and Vickers and Lin (2022) consider offline studying to be important and suggest the organization of blended learning. The professional activity of a preschool teacher is related to creativity and requires improvisation, the ability to think quickly and combine one’s own and others’ experiences to create new forms of organizing children’s activities.

The theoretical consequences of the study are the formation of a base for modeling educational and professional training of students to increase the effectiveness of future teachers’ training. The practical implication of the research is the formation of a system of educational activities in times of war. The practical significance also lies in the fact that, as part of its preparation, we carried out a comprehensive study of the peculiarities of preschool education in war.

The main limitation of the study is the difficulty of identifying the results of the study due to the limited sample of students and the correspondence of the used methods to the research task, taking into account the needs of the modern education system. In connection with the declaration of martial law, it was difficult to test the research materials in the real educational process.

6. Conclusions

The relevance of the chosen research topic is determined by the need for high-quality training of pedagogical workers in wartime. New realities demand the quality of pedagogical education to be at the highest level, especially

when it comes to preschool teachers. *Conclusions.* Despite martial law, the structural-functional model demonstrates positive results in the formation of professional competences. Despite all the limitations, we managed to form stable and high professional competencies in future preschool teachers. The use of advanced technologies makes it possible to obtain high results in students' educational achievements, as evidenced by the obtained results of research and experimental work.

Where they can be applied. The results of the study may be of interest to education workers, students, managers, and teachers of HEIs. Approbation of the presented research methods and their statistical processing is of particular value. The data obtained during the research can be used in the formation of individual curriculums for future preschool teachers. *Prospects for future research* should focus on the effective methods of organizing the educational process in situations of war. Further research may also compare the effectiveness of the acquisition of professional competencies by specialists in different pedagogical fields.

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