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Preparation of future preschool teachers for interaction with children in a natural environment


Preparación de futuros profesores de preescolar para la interacción con los niños en un entorno natural

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Abstract

The purpose of the study was to determine the level of formation of professional competencies and components of the readiness of future preschool teachers for interaction with children of early and preschool age in a natural environment. The methods used in the research are: Identifying the teacher's abilities for self-development (I. Nikishyna), the technique for diagnosing reflexivity (A. Karpov, V. Ponomareva), Research of the level of empathic tendencies (I. Yusupov), Methods of assessing cognitive potential in education (M. Shevardin). For statistical processing of the results, descriptive analysis, dispersion analysis, and correlation analysis were used. It was found that future preschool teachers have a high level of readiness for interaction with children of early and preschool age in a natural environment. They have developed empathy, self-development abilities, cognitive potentials, and reflexivity. Professional competencies are also developed at a high level. A positive correlation was established between the components of readiness for interaction with children in a natural environment and professional competencies. The obtained research results support the expansion of educational programs for future preschool teachers by including the development of such qualities as empathy, reflexivity, a desire for self-development, and cognitive potential in the list of necessary competencies.

Keywords: Competence, professional training, empathy, reflexivity, cognitive potential, education standard.

Resumen

El propósito del estudio fue determinar el nivel de formación de competencias profesionales y componentes de la preparación de los futuros docentes de preescolar para la interacción con niños de edad temprana y preescolar en un entorno natural. Los métodos utilizados en la investigación son: identificación de las habilidades del docente para el autodesarrollo (I. Nikishyna), la técnica para diagnosticar la reflexividad (A. Karpov, V. Ponomareva), investigación del nivel de tendencias empáticas (I. Yusupov), Métodos de evaluación del potencial cognitivo en educación (M. Shevardin). Para el procesamiento estadístico de los resultados se utilizó análisis descriptivo, análisis de dispersión y análisis de correlación. Se encontró que los futuros maestros de preescolar tienen un alto nivel de preparación para interactuar con niños de edad temprana y preescolar en un entorno natural. Han desarrollado empatía, habilidades de autodesarrollo, potenciales cognitivos y reflexividad. Las competencias profesionales también se desarrollan a un alto nivel. Se estableció una correlación positiva entre los componentes de la preparación para la interacción con los niños en un entorno natural y las competencias profesionales. Los resultados de la investigación obtenidos apoyan la ampliación de los programas educativos para futuros maestros de preescolar al incluir el desarrollo de cualidades como la empatía, la reflexividad, el deseo de autodesarrollo y el potencial cognitivo en la lista de competencias necesarias.

Palabras clave: Competencia, formación profesional, empatía, reflexividad, potencial cognitivo, nivel educativo.

Introduction

Transformation processes in the modern higher education system involve a radical restructuring of the system for specialist training. The focus is on active adaptation to the European standards system, expanding students' independence in studying professional disciplines and implementing new methods of control and assessment (Kompirović et al., 2023). These changes also apply to preschool education, as future preschool teachers are the primary link in a child's education and development. The professional competence of future preschool teachers is an important priority of higher education in the field of pedagogy (Czepil, 2021). Pedagogical training, being an important part of the professional training of early childhood education specialists, is a significant means of enhancing the qualifications of future teachers (Liu & Zhang, 2023). The quality of preschool education directly affects the professional competence and professional development of future teachers (Zhanga & Wub, 2022).

Within the framework of the updated Higher Education Standard for the specialization 012 "Preschool Education" (second (master's) level of higher education) in Ukraine, the directions for the training of future teachers are expanding to carry out professional activities in various areas (Zdanevych et al., 2020). The Standard defines the main competencies that specialists in preschool education should possess. Among these competencies, the ecological and natural development of children and interaction in the natural environment are particularly important. These competencies correspond to the main results of educational work with preschoolers, as indicated in the Basic Component of Preschool Education in Ukraine (LIGA 360, 2021).

The interaction with the natural environment gives a child the opportunity to understand the essence of the surrounding environment, acquire skills for appropriate behavior, and form their values towards the natural world and animals (Masnan et al., 2021). The development of key competencies in children plays a crucial role in preparing them for life in the surrounding environment and fostering their ability to interact with it (Gyoreva, 2022).

Preschool education today highlights the value of outdoor play as a priority for children (Smedsrud et al., 2024). Future preschool teachers must be equipped to integrate nature-oriented learning components, skills, and values into their teaching practices (Masnan et al., 2021). The professionalism of preschool teachers plays a crucial role in the development of young children (Tatalović-Vorkapić & Vesna, 2015).



Preschool teachers' support for outdoor play is influenced by their understanding of what the natural environment offers (Mortensen & Barnett, 2015). Different types of environments afford different learning opportunities. However, preschool teachers, especially those working in early childhood education, often have a limited understanding of the educational potential of natural environments (Levine Brown et al., 2022). Therefore, a full awareness of the benefits of children's interaction with nature is a prerequisite for implementing supportive learning in playful settings. This demonstrates that the quality preparation of future preschool teachers ensures the holistic development of preschool children through their interactions with the natural environment.

The main structural unit of the training of preschool teachers is the formation of competencies laid down in the Standard of Higher Preschool Education (Verkhovna Rada of Ukraine, 2010). Professional competence implies that future preschool teachers possess professional skills at a high level, which ensures their competitiveness as specialists (Salaam, 2023). The full formation of general and special professional competencies will contribute to the effective preparation of future preschool teachers for interaction with children of early and preschool age in the natural environment.

The purpose of the study is to determine the level of readiness of future preschool teachers for interaction with children of early and preschool age in the natural environment and the formation of their basic competencies. Based on the goal, the hypothesis was put forward: there is a direct relationship between the components of readiness for professional activity and professional competencies for working in the natural environment among future preschool teachers.

Based on the purpose and hypothesis, the following research tasks were set:

- To diagnose the components of future preschool teachers' readiness for professional activity;
- To identify the formation of general and special competencies of future preschool teachers;
- To compare gender characteristics of future preschool teachers' readiness for professional activity;
- To identify the relationship between the components of readiness for professional activity and professional competencies for working in the natural environment.

Literature Review

Competence is a professional readiness to solve professional tasks, and the professional competence of a preschool teacher is a set of theoretical and practical aspects of preparation for professional activity (Czepil, 2021). In the National Qualification Framework, competence is defined as a training outcome. The essence lies in the extent to which a graduate of a higher educational institution is able to demonstrate the acquired knowledge and skills after completing the training. According to the National Classifier of Ukraine DK 003:2010 "Classifier of Occupations" (Verkhovna Rada of Ukraine, 2010), the profession of a preschool teacher has the code 2332 and the full name "Preschool teacher". The professional competence of future preschool teachers of early and preschool children is a characteristic of the ability to perform professional activities based on acquired knowledge, skills, and abilities. Among them, the main ones are respect and love for children, empathy, reflection, and positive communication (Tokatligil et al., 2022). The professional competence of preschool teachers is an important and effective component of the educational process (Kaļķe et al., 2022).

The Preschool Education Standard (Verkhovna Rada of Ukraine, 2010) outlines 11 professional competencies that describe the abilities, knowledge, and skills that a preschool teacher must possess. The Standard distinguishes between general and special competencies. General competencies are those abilities and knowledge that enable preschool teachers to fully develop children of early and preschool age. Special competencies of a future preschool teacher specify his or her knowledge, skills, and abilities to work with children in a specific area. In our case, the special abilities of future preschool teachers pertain



to their readiness to interact with the natural environment. They include the ability to form initial ideas about the natural environment in children of early and preschool age, the ability to develop skills of environmentally safe behavior, aesthetic attitude to the environment, and the ability to create and implement new ideas in classes with children.

Using different forms, methods, and tools for working with children, preschool teachers form in them a conscious attitude towards the natural environment and a sense of aesthetic delight (Mortensen & Barnett, 2015). It has been proven that children who spend time in the natural environment are well aware of the environment, and have a positive environmental attitude and connection with nature (Smedsrud et al., 2024). At the same time, this knowledge relies on the quality of training provided to preschool teachers, and with a sufficient level of knowledge and skills, these teachers can effectively apply suitable methods and forms of work in their professional activities (Narea et al., 2022).

It is especially important to highlight the influence of the personal qualities of preschool teachers on the development of children in the natural environment. Preschool teachers who demonstrate empathy and reflection, which allow them to emotionally and sensually reflect reality, promote the development of a positive attitude towards the natural environment and aesthetic feelings in children (Levine Brown et al., 2022).

The ability of preschool teachers to organize active recreation in the natural environment deserves special attention. The combination of professional knowledge and personal cognitive potential ensures an increase in physical activity and improves motor skills in children (Humphries et al., 2018). This provides advantages in the development of self-esteem, self-efficacy, resilience, and cognitive productivity (Gyoreva, 2022).

Scientists have proven that the natural environment contributes to the improvement of cognitive outcomes, such as play, learning, and creativity (Kompirović et al. 2023). This is especially important in early childhood, as it promotes the development of attention, punctuality, concentration, and various types of play activities (Seaman & Giles, 2021). Overall, it has been shown that children's exposure to the natural environment is beneficial for their well-being and development (Nilfyr et al., 2021). These advantages of the natural environment in the development of children of early and preschool age prove their relevance and the need for training qualified preschool teachers who would contribute to expanding opportunities in this field of educational and developmental work.

Methods

Research procedure

The research was conducted from October 2023 to March 2024 and consisted of 4 stages. The first stage of the research involved a theoretical and methodological analysis of the scientific literature on the research topic. The second stage included the selection and structuring of the competencies of future preschool teachers, as well as the selection of diagnostic methods. The third stage involved testing students to identify the corresponding competencies. The fourth stage included the analysis and interpretation of the obtained results, substantiation of conclusions, and prospects for further research.

Sample Formation

The study involved 280 students who are pursuing a second (master's) level of education in the specialty of 012 "Preschool education" on a full-time basis aged 21 to 25 years. Among them, 186 are female and 94 are male students.



The sample was formed based on the Department of Preschool and Special Education of the Pedagogical Faculty of Mukachevo State University (43 students), the Communal Institution "Kharkiv Humanitarian-Pedagogical Academy" of the Kharkiv Regional Council (65 students), the Faculty of Preschool and Special Education and History, the Department of Theory and Methods of Preschool Education (Kharkiv city) (72 students), the Department of General Pedagogy and Pedagogy of Higher Education of the Faculty of Social Sciences of the State Higher Educational Institution "Uzhhorod National University" (55 students), and the Department of Preschool Pedagogy, Primary Education, and Educational Management of Mukachevo State University (45 students).

Methods

According to the Higher Education Standard for the 012 "Preschool Education" specialization, we have identified general and specific competencies of future preschool teachers that reflect their readiness to interact with children of early and preschool age in a natural environment as follows:

- 1) General: the ability to provide psychological and pedagogical guidance in the personal development of a child; possess skills and abilities in analysis, forecasting, planning, and organizing the educational process; analyze and compare the results of pedagogical influence on the individual development of a preschool child in different types of activities; apply modern didactic technologies and methodologies in professional activities.
- 2) Special: the ability to develop in children of early and preschool age initial concepts about the natural environment; the ability to develop in children of early and preschool age skills of environmentally safe behavior; the ability to develop in children of early and preschool age an aesthetic and respectful attitude towards the environment; the ability to generate new ideas for implementing them in activities with children in the conditions of the natural environment.

Competencies were assessed based on the learning outcomes according to the following criteria: 1 point - competency not developed, 2 points - low level of development, 3 - partial development, and 4 - full development.

Structural analysis of various types of readiness of future preschool teachers for professional activities allowed us to distinguish three levels of readiness for interaction with children of early and preschool age in the natural environment.

- 1) The first and personal level reflects the ability for self-development. The "Identifying the teacher's abilities for self-development" method (I.V. Nikishina) is used to study this level. The method aims to study the abilities of future preschool teachers for continuous self-development during their professional training.
- 2) The second emotional level includes the study of the reflexivity of future preschool teachers and their empathy. The technique for diagnosing reflexivity (A. V. Karpov, V. V. Ponomareva) is chosen to study reflexivity. Preschool teacher's reflexivity is the ability to go beyond one's "self," to contemplate, study, and analyze something by comparing the image of one's "self" with events. Empathy reflects the ability to emotionally respond to the emotional state of others, fostering compassion. Preschool teachers with high empathy can instill respect for nature, and animals, compassion, and kindness in children. Empathy was studied using the method of researching the level of empathic tendencies ("Research of the level of empathic tendencies" (I. Yusupov)). The test identified three levels of empathy: low, medium, and high.
- 3) The cognitive level of readiness to interact with children of early and preschool age in a natural environment is presented by the Method of assessing cognitive potential in education (Shevardin M.K). The goal of the test is to determine the ability to acquire new knowledge and actively apply it in practice.



Statistical Methods

Frequency analysis, descriptive statistics, Pearson correlation analysis, and one-way analysis of variance (Anova) were used.

Research Ethics Criteria

The ethics of the research were ensured by the voluntary consent of the respondents to participate in the diagnosis. Before testing, students were informed about the purpose and objectives of the study and the confidentiality of the results was guaranteed.

Results and Discussion

The results showed that future preschool teachers have a high level of self-development ability (Figure 1), which expresses students' desire to acquire new knowledge and skills, expand their practical experience, and improve personal qualities.

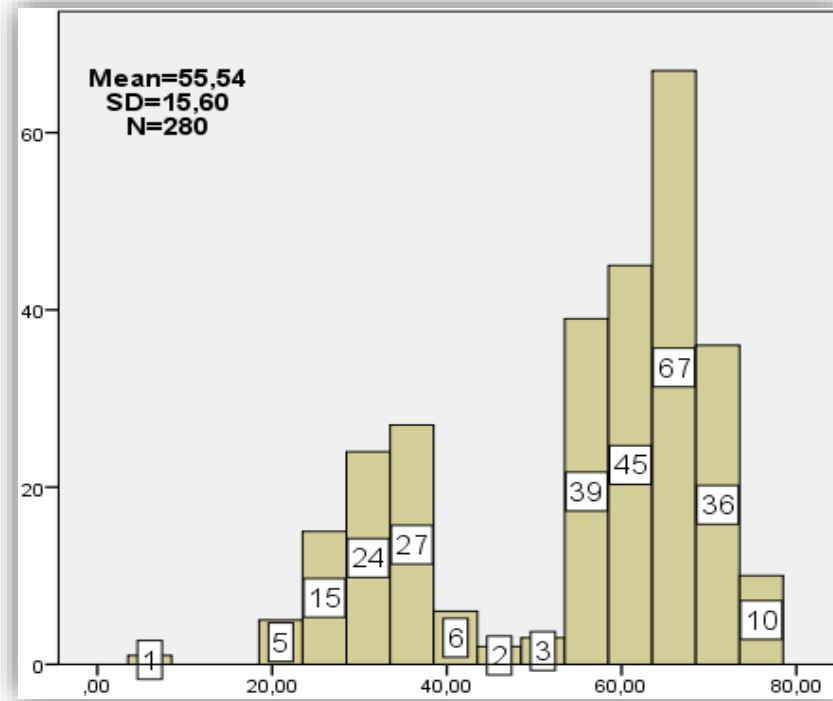


Figure 1. Frequency distribution of indicators of future preschool teachers' self-development ability.

It was found that future preschool teachers have a quite high level of cognitive potential (Figure 2). This indicates that students have developed thinking processes that contribute to better knowledge acquisition. Such potential is the basis for self-development, acquiring new knowledge, and using the experience already gained.

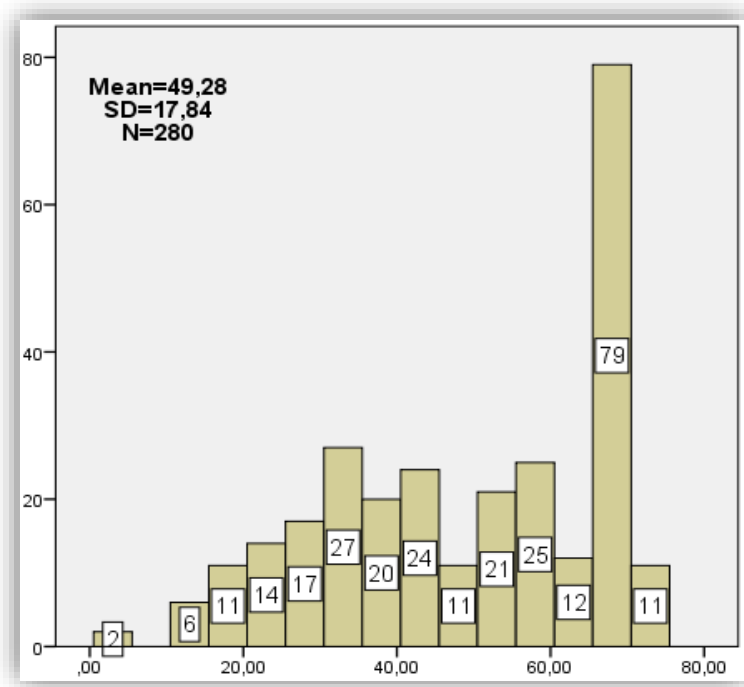


Figure 2. Frequency distribution of indicators of future preschool teachers' cognitive potential.

It has been found that students have a high level of empathy (Figure 3). Empathy is one of the key traits of future preschool teachers because it is required for building trusting relationships with children while emotional attunement provides feedback and encourages children to actively cooperate.

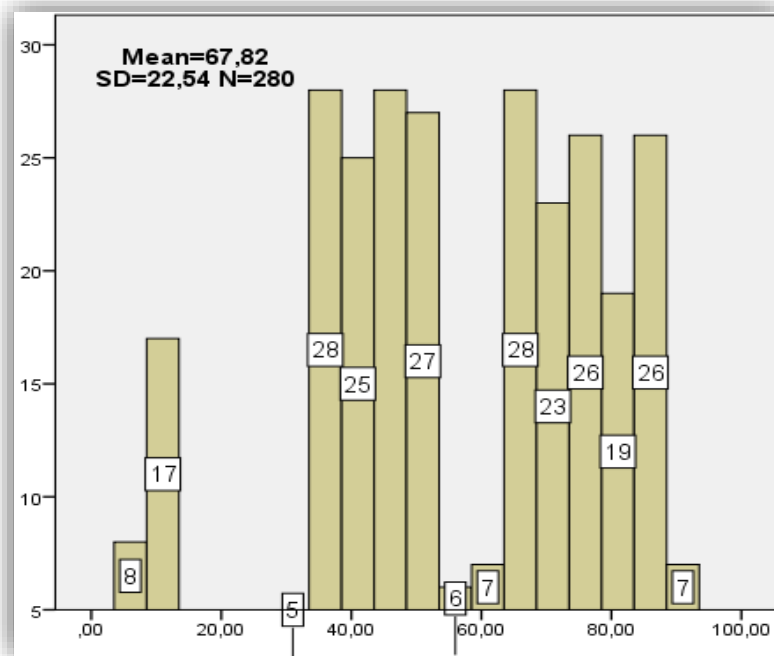


Figure 3. Frequency analysis of indicators of empathy in future preschool teachers.

The study of reflexivity in future preschool teachers showed a high level of expression of all three parameters (Figure 4). The reflexivity of future preschool teachers fosters self-assessment, and adjustment of activities, and at the same time, it also allows them to be highly attuned to even the subtlest shifts in children's behavior. Accordingly, reflexivity allows for regulating the educational process taking into account all the personal characteristics of early and preschool-age children.

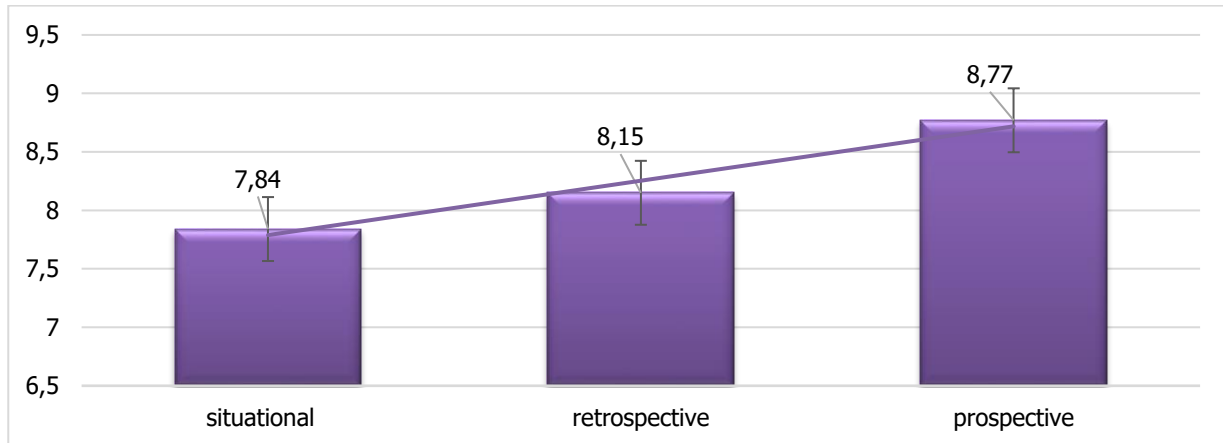


Figure 4. Average values of parameters of reflexivity in future preschool teachers.

Our analysis of the gender aspect of the identified components of readiness of future preschool teachers to interact with children of early and preschool age in a natural environment has revealed no statistically significant differences. This indicates the equal formation of readiness among male and female students (Table 1).

Table 1.

Indicators of components of readiness of future preschool teachers for professional activity (N=280)

Gender		Aptitude for self-development	Cognitive potential	Empathy	Reflexivity		
					Situation-based	Retrospective	Prospective
male	Mean	53,29	47,61	66,48	7,24	8,11	8,38
	SD	14,83	16,73	20,85	1,29	1,19	1,27
	N	94	94	94	94	94	94
female	Mean	54,85	49,55	67,02	7,33	7,95	8,16
	SD	15,01	15,84	20,81	1,17	1,02	1,22
	N	186	186	186	186	186	186
F		1,781	0,247	0,739	1,112	0,947	1,257
Total	Mean	55,54	49,28	67,82	7,84	8,15	8,77
	SD	15,60	17,84	22,54	1,16	1,23	1,35
	N	280	280	280	280	280	280

According to the table data, the average values for all investigated parameters correspond to a high level of formation both separately in the group of female and male students, and in the sample as a whole. This indicates that future preschool teachers have a high ability for self-development, the ability to acquire and use knowledge, developed empathic abilities, and formed reflexivity. These parameters do not depend on gender. Thus, these components of readiness for interaction with children of early and preschool age in a natural environment are a condition for effective professional activity.

It has been established that future preschool teachers have a high level of developed professional competencies that contribute to the interaction with children of early and preschool age in a natural environment (Table 2).

Table 2.

Indicators of professional competencies of future preschool teachers (N=280)

Professional competencies	not formed	low formation	partial formation	fully formed	σ
ability to provide psychological and pedagogical guidance for the personal development of a child	2%	8%	20%	70%	0,712
ability to possess skills and competencies in analyzing, forecasting, planning, and organizing the educational process	1%	6%	9%	84%	0,487
ability to analyze and compare the results of pedagogical influence on the individual development of preschool children in various types of activities	0	7%	13%	80%	0,628
ability to apply modern didactic technologies and methodologies in professional activities	3%	16%	21%	60%	0,547
ability to form in children of early and preschool age basic concepts of the natural environment	0	4%	11%	85%	0,688
ability to cultivate in children of early and preschool age skills of environmentally safe behavior	0	6%	14%	80%	0,763
ability to foster in children of early and preschool age an aesthetic attitude toward the environment	0	0	8%	92%	0,679
ability to generate new ideas for implementing them in activities with children in natural environment conditions	0	4%	8%	88%	0,534

According to the data obtained, the largest share of variance is represented by competencies such as the ability to provide psychological and pedagogical guidance in the individual development of a child; analyze and compare the results of pedagogical influence on the individual development of a child in various activities; the ability to form in children primary ideas about the natural environment, and to cultivate in them an aesthetic attitude towards the environment and environmentally friendly behavior.

These results indicate that these competencies are the most pronounced in students and that they collectively form the level of professional training.

Correlation analysis revealed direct relationships between the components of readiness for interaction with children of early and preschool age in a natural environment and the necessary professional competencies (Table 3).

Table 3.

Correlation analysis of the relationship between components of professional preparation of future preschool teachers for the interaction with children in the natural environment and necessary professional competencies (N=280)

Professional competencies	Aptitude for self-development	Cognitive potential	Empathy	Reflexivity		
				Situational	Retrospective	Prospective
ability to provide psychological and pedagogical guidance for the personal development of a child	0,491**	0,765**	0,314**	0,681**	0,730**	0,412**
ability to possess skills and competencies in analysis, forecasting, planning, and organizing the educational process	0,771**	0,526**	0,240**	0,575**	0,541**	0,711**
ability to analyze and compare the results of pedagogical influence on the personal development of preschool children in various types of activities	0,548**	0,720**	0,301**	0,815**	0,497**	0,529**
ability to apply modern didactic technologies and methodologies in professional activities	0,401**	0,839**	0,332**	0,648**	0,601**	0,697**
ability to form in children of early and preschool age basic concepts of the natural environment	0,451**	0,640**	0,339**	0,545**	0,410**	0,760**
ability to cultivate in children of early and preschool age skills of environmentally safe behavior	0,469**	0,468**	0,328**	0,577**	0,650**	0,610**
ability to foster in children of early and preschool age an aesthetic attitude towards the environment	0,326**	0,438**	0,758**	0,498**	0,482**	0,514**
ability to generate new ideas for implementing them in activities with children in natural environment conditions	0,736**	0,791**	0,258**	0,639**	0,673**	0,745**

*Note: * - $p \leq 0,05$, ** - $p \leq 0,01$*

According to the table data, positive correlation links have been found between all components of readiness of future preschool teachers for interaction with children of early and preschool age in a natural environment and necessary professional competencies. The highest coefficients are observed between the ability to provide psychological and pedagogical guidance in the individual development of a child and cognitive potential and retrospective reflexivity. Between the ability to possess skills and abilities of analysis, forecasting, planning, and organizing the educational process, and the ability for self-development, and prospective reflexivity. Between the ability to analyze and compare the results of pedagogical influence on

the individual development of a preschool-age child in various activities and cognitive development and situational reflexivity. Between the ability to apply modern didactic technologies and methods in professional activities and cognitive potential. Between the ability to form in children of early and preschool age primary ideas about the natural environment and prospective reflexivity. Between the ability to cultivate in children of early and preschool age an aesthetic attitude towards the environment and empathy. Between the ability to generate new ideas for implementing them in activities with children in natural environment conditions and self-development, cognitive potential, and prospective reflexivity. The obtained relationships indicate that the identified competencies are inseparable from such components of readiness for professional activity as self-development, cognitive potential, empathy, and reflexivity. The higher the readiness indicators, the higher the indicators of professional competencies.

Our findings indicate that students, future preschool teachers, have high indicators of self-development, cognitive potential, empathy, and reflexivity. This demonstrates their high level of professional training. They have developed both general and specific competencies that allow them to effectively interact with children of early and preschool age in natural environment conditions. Additionally, a direct relationship was found between components of professional preparation and professional competencies, proving their interdependence.

Similar results have been found in other studies. It has been established, for example, that the professional competence of a preschool teacher is a prerequisite for the quality of their pedagogical work (Duraku et al., 2022). Furthermore, professional competence affects the learning and learning outcomes of children (Kaļķe et al., 2022). The high level of natural science knowledge of future preschool teachers ensures children's excellent knowledge of the natural environment (Masnan et al., 2021). It has been found that the completion of training for future preschool teachers positively correlates with a significant increase in their level of knowledge and skills, as well as an increase in the level of self-development (Duraku et al., 2022). These results demonstrate the benefits of professional training and development of future preschool teachers, which in turn improves the effectiveness of early education and the natural development of children (Abril-López et al., 2021).

For instilling humane attitudes toward nature in children of early and preschool age, it is important to cultivate humane feelings and positive experiences of interacting with nature. Only preschool teachers with high levels of empathy and reflexivity are capable of developing such qualities in children (Fushtei & Sarancha, 2023). One of the key competencies of future preschool teachers is their professionalism combined with knowledge and skills (Blewitt et al., 2020). In Ukraine, unlike in European countries, the preparation of future preschool teachers is based on the formation of key professional competencies combined with basic knowledge, values orientations, and motives of pedagogical activity (Zdanevych et al., 2020).

However, some scholars emphasize the gap between theory and practice in the preparation of future preschool teachers, which complicates the process of forming the relevant competencies for interacting with children in the natural environment (Zhanga & Wub, 2022). It is noted that the use of special methods in the training of future preschool teachers contributes to the improvement of their professional skills and competencies (Krasovska et al., 2020).

The professional competence of future preschool teachers determines the level of educational and research preparation of preschool children in interacting with the natural environment (Tokatligil et al., 2022). Therefore, effective teaching methods should be implemented from the first year of study to promote the development of professional competencies of early childhood education students (Weatherby-Fell et al., 2019). To improve the quality of future preschool teachers' training, it is necessary to create more opportunities for their learning using effective resources (Khandaker, 2021).



Thus, the updated higher education standard for the specialty 012 Preschool Education is oriented towards the formation of general and specific competencies of future preschool teachers, including readiness for interaction with children of early and preschool age in the natural environment.

Conclusions

The study revealed that future preschool teachers demonstrate a high level of readiness for professional activity with children of early and preschool age in the natural environment. Developed aspirations for self-improvement, cognitive potential, empathy, and reflexivity in the interaction with general and special professional competencies contribute to the full development of children of early and preschool age, their acquisition of relevant knowledge about the natural environment, aesthetic attitude towards it, and environmentally safe behavior. Such results are useful from several perspectives. Firstly, the identified components of professional training for future preschool teachers make it possible to include their development in educational programs, which will contribute to the development of their key competencies. Secondly, the identified connection between cognitive, emotional, and personal components of readiness for professional activity and competencies proves their imminent development. This is useful for the students themselves, who must direct their efforts towards self-improvement, constant development of skills, and expanding experience to achieve efficiency in their work. Thirdly, the identified high level of training of future preschool teachers increases their chances of employment, makes them competitive professionals, and expands professional opportunities in interacting with children of early and preschool age in the natural environment.

Limitations of the study include the influence of individual characteristics of future preschool teachers on the level of their readiness. Motivation for professional choice, academic achievements, and personality traits may limit the adequacy of the results obtained. Therefore, studying these aspects may be a prospect for further research.

Additionally, it is advisable to conduct a study in the future to examine the correspondence of general and special competencies of students with the aspects of development of preschool children prescribed in the Basic Component of preschool education.

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