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Pedagogical conditions for developing the creativity of future teachers in the process of their professional training

Педагогічні умови розвитку творчості майбутніх учителів у процесі професійної підготовки

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Abstract


Today, institutions of higher pedagogical education require the constant development of creativity of students of higher education, the implementation of a system of purposeful development of it to ensure the training of future specialists capable of professional activity in the conditions of the New Ukrainian school, the development of key competencies of students, and the implementation of state policy on comprehensive personality development. Therefore, the purpose of the article is to identify and substantiate the pedagogical conditions under which the process of developing the creativity of future teachers would be as effective as possible and ensure the successful solution of the specified tasks. In the process of research, we used the following methods: theoretical; empirical; statistical. The article describes the stages of selection and ranking of pedagogical


Анотація


Сьогодення вимагає від закладів вищої педагогічної освіти постійного розвитку творчості здобувачів вищої освіти, реалізації системи цілеспрямованого її розвитку для забезпечення підготовки майбутніх фахівців, здатних до професійної діяльності в умовах Нової української школи, розвитку ключових компетентностей учнів, утілення державної політики щодо всебічного розвитку особистості. Тому метою статті є виявлення та обґрунтування педагогічних умов, за яких процес розвитку творчості майбутніх педагогів був би максимально ефективним та забезпечував успішне розв'язання зазначених завдань. У статті описано етапи відбору й ранжування педагогічних умов розвитку творчості майбутніх педагогів у процесі фахової підготовки в закладах вищої освіти, а також схарактеризовано роль і місце

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conditions for the development of creativity of future teachers in the process of professional training in institutions of higher education of education, as well as the role and place of these conditions in the system of purposeful development of creativity of future teachers are characterized.

Keywords: higher education students, future teachers, pedagogical conditions, pedagogical university, ranking, developing creativity.

Introduction

The beginning of the new century is characterized by the search for ways of improving the quality of higher professional education which is important for the sustainable development of the society and the economic well-being of the country. The current socio-economic situation in Ukraine sets new demands on the process of training future specialists in the institutions of higher education since the acquisition of only subject knowledge in modern society does not make graduates competitive at the labour market.

The demand for the competitive professionals updated by the market economy gives rise to the primary task of developing such abilities of an individual that reveal their individual qualities, intellectual capabilities and creative potential, because the social development of a nation is always closely connected with creativity. New orientations of professional education, modern achievements of science determine the choice of technologies, which are increasingly preferred by teachers.

At the same time developing the creativity of future specialists in the educational process of pedagogical higher education institutions due to the lack of flexible plans, programmes, textbooks, the insufficient use of innovative technologies occurs spontaneously, does not encourage the students of education to professional creativity and extremely slowly reorients the components of the current educational system on the basis of modern concepts.

Based on the above mentioned provisions, the purpose of our publication is to identify and substantiate the pedagogical conditions under which the process of developing the creativity of future teachers in the process of studying at the pedagogical institutions of higher education would be as effective as possible and ensure the successful solution of the specified problem.

значених умов у системі цілеспрямованого розвитку творчості майбутніх педагогів.

Ключові слова: здобувачі вищої освіти, майбутні педагоги, педагогічні умови, педагогічний університет, ранжування, розвиток творчості.

Literature Review

In the current stage of the Ukrainian education system institutions of higher pedagogical education, future teachers should possess not only a high level of pedagogical skills in order to successfully fulfill their professional duties, but also demonstrate constant developing their own creativity, implementing the system of its purposeful developing in order to ensure training future specialists capable of professional activity in the conditions of the New Ukrainian School, the formation of students key competencies, the implementation of state policy regarding the comprehensive development of the personality (Wu et al., 2014; Edens et al., 2015; Wen et al., 2017; Kurok et al., 2022; Marieiev et al., 2023).

The effectiveness of the implementation of the system of developing the creativity of future teachers in the process of their professional training is possible provided that the pedagogical conditions are observed, which will contribute to the organization of the effective activities of all the participants in the educational process of the pedagogical institutions of higher education, aimed at solving the outlined problem. The philosophical dictionary contains the concept of 'condition' defined as 'a category that reflects the universal relations of a thing to the factors due to which it arises and exists' (Wu et al., 2014). Sometimes creativity is interpreted as a vector of positive ways out of social instability, conflicts and dissatisfaction (Nerubasska & Maksymchuk, 2020).

In the pedagogical literature, the concept of 'pedagogical conditions' is more often used, which is interpreted differently by scientists. Thus, O. Antonova states that pedagogical conditions can be defined as "a set of objective possibilities of forms, methods and techniques, the content of increasing the efficiency of the educational process, which ensure the solution of the tasks of the scientific research" (Antonova, 2012). I. Onyshchenko names pedagogical conditions as a set of content, possibilities,

methods, techniques and forms (Onyshchenko, 2016).

General issues on developing the creative abilities of higher education institutions students were considered in the article (Vaganova et al., 2019). It was pointed to the increase in the professional requirements for university graduates. The focus was on the need to create the conditions for the realization of students' creative potential.

Crucial is the keynote due to which "bringing creativity to the rank of major productive force eliminates the characteristics of alienation of human from work" (Glazkova et al., 2020, 152).

So, we understand the concept of 'pedagogical conditions' as a set of certain circumstances aimed at increasing the effectiveness of the pedagogical processes and phenomena, in particular, the development of creativity of future teachers. We will talk about the complex of pedagogical conditions, since they are all interdependent and interconnected. Therefore, we set the task of their scientific substantiation, based on the analysis of the separate components, features and properties of the object (the creativity of future teachers), which will ensure the effectiveness of the development of this phenomenon.

The essence and significance of the pedagogical conditions selected by the expert group should be analysed here. The experts singled out «*applying innovative teaching/learning technologies in the professional training of future teachers*» as a pedagogical condition for developing creativity of future teachers of rank No. 1. This condition is, in our opinion, very important, since the analysis of the isolated factors of developing creativity of future teachers showed that the vast majority of them are interrelated and require the use of innovative technologies in the process of professional training (combining them with yjr traditional ones).

Agreeing with the opinion of I. Dychkivs'ka, by innovative pedagogical technologies in our research we understand the process of purposeful, systematic and consistent introducing the original, innovative techniques, methods, pedagogical actions and means covering a holistic educational process, from the definition of its goals to the expected result of the activity, into the practice of the institution of higher education (Dychkivs'ka, 2011).

According to T. Batyuta, an important feature of the European education system is applying modern innovative technologies alongside with the traditional teaching/learning technologies, the main characteristics of which are the following: technologicalization of all types of research (in natural science, mathematics, chemistry, humanities and social sciences, political science and culture, etc.); implementation by the state of redistribution of funding from fundamental research to technological research; introduction of the most modern network and computer technologies; constant integration and modernization of scientific, research and educational systems, increasing the prestige of the Ukrainian education, science and technology, solving the problems of sustainable development, preventing destabilization on the global and local scale; active use of the latest information and communication, educational technologies (Batyuta & Dychkivs'ka, 2001).

We can agree with the authors, who single out the following among the main directions of the outlined process: the organization of the educational and informational and subject-oriented environment that will allow applying multimedia tools, hypermedia systems, electronic textbooks, etc.; mastering means of communication (computer networks, television, telephone, satellite communication for the purpose of exchanging information resources); compliance with the conditions and principles, skills and rules of «being» in the information and educational space; development of distance teaching/learning and the distance education system in general (Batyuta, & Dychkivs'ka, 2001).

It should be noted that the main innovative technologies in education are considered to be: technologies of individualization of the educational process (educational design, adaptive learning system, productive learning, etc.); interactive learning technologies (interaction of participants in the educational process to jointly solve educational problems; training sessions, etc.); multimedia technologies (technologies that combine graphic, text, video and audio information for the purpose of creating presentations, electronic manuals, educational films, etc.); network technologies (organization of distance teaching/learning, telecommunication of students with teachers, library workers, colleagues using teleconferences, e-mail, etc.) (Khymynets', 2009; **Error! No se encuentra el origen de la referencia.**).

The choice of the outlined pedagogical conditions is also confirmed by the fact that electronic learning as a feature of the latest educational technologies, is very important in the field of the European integration which is understood as the educational space where the formation and development of higher education students includes personal qualities that will be needed by a modern person in their life: the ability to think critically and globally; knowledge of the basics of media literacy; the ability for creative development and self-development, for solving creative tasks; development of readiness to work in a team; development of civic consciousness (Jackson, 2013; Novolokova, 2019).

At the same time, the fulfillment of the outlined pedagogical condition encourages higher education students to work in the team, to use productive, dialogical, modern teaching methods in order to more effectively train them for the creative professional activity.

The group of experts singled out «*creating the favourable educational environment focused on developing creativity of higher education students*» as a pedagogical condition for developing the creativity of future teachers of rank No. 2. It is well known that in the modern educational institution, a teacher cannot and should not be a transmitter of certain information (ready-made knowledge). In this regard, they need to direct their own efforts to selecting forms, methods, techniques and technologies that will be interesting to future teachers, take into account their cognitive interests, personal creative potential, that is, encourage creativity, creative thinking. Creative educational environment is not limited only to the educational opportunities of the university, it should provide for the opportunity for modern teachers and students of education to receive the latest information in the world. Such an environment should be personally oriented, benevolent, cohesive and stimulate free expression of thoughts, ideas, free choice of methods and forms of educational activity by the students. In the writings, H. Tokman' convinces that the atmosphere of approval and respect for creativity should be created (Tokman', 2012).

The correct interpretation of the concept of 'creative educational environment' is presented in the works of O. Petrovych, who considers it as 'a set of organically combined systemic conditions for the development of creativity of future specialists, taking into account their individual characteristics, self-improvement and

self-realization, forming their creative and critical thinking on the basis of the dialogic interaction of the teacher and students with the aim of qualitatively training them for the organization of work with gifted students (Petrovych, 2014).

Developing the creative educational environment has a positive effect on the educational motivation of future teachers, encourages them to various types of creative activity, forms a valuable attitude to creativity, the development of one's own creative potential through the realization of the need for self-education, self-improvement, self-development, etc.

The next pedagogical condition (with rank No. 3) is «purposeful developing the personal creative qualities» of education students. The significance of the specified pedagogical condition cannot be underestimated, since it is due to the fact that positive emotions, the psychological aspect of any process, including developing the creativity of future teachers, mobilize all the mental processes of the subject of activity, increase their cognitive activity, will, desire to solve the assigned tasks, reveal abilities, matching them with their own needs and interests (Lubart, 2010; Stojanova, 2010).

The authors see the implementation of this pedagogical condition into the educational institution in the organization of circumstances that would contribute to the development of the creative direction of the educational process, which should be manifested in the emotions, will, desire, awareness, consciousness and feelings of future teachers. After all, it is known that emotions, feelings, desires arise due to real objects, events, people, which allows us to focus on the practical implementation of this condition and ensure the personal activity of future teachers while developing their creativity (enjoying the obtained positive results, sadness due to unfinished work, fear of making a mistake, not proving oneself right, despair due to the loss of the opportunity to bring the case to the end, etc.).

Therefore, all of the above mentioned is generated, as a rule, in the real educational process and prompts the student to perform certain actions, overcome difficulties, develop the ability to restrain emotions, behave correctly, intelligently, since their positive perception and awareness of the development of teacher's and student's creativity during the professional training stimulates emotions, will, which cause the need for the further movement towards

creativity, acquisition of the necessary knowledge, skills, abilities, reflections, etc.

The purposeful development of creativity of future teachers can be seen in applying creative tasks, projects, innovative technologies, interactive, creative methods in the educational process.

The group of experts singled out «*filling the theoretical and practical components of the professional training of future teachers with content aimed at the development of their creativity*» as a pedagogical condition for developing the creativity of future teachers of rank No. 4. This is explained by the fact that increasing the efficiency of the system of developing the creativity of future teachers in the process of their professional training is possible only if changes are made to all the components of the educational process of the pedagogical higher education institution.

To implement this pedagogical condition in practice, the main goals of training future teachers should be determined and oriented to higher productive levels of the educational activity, which, in turn, outlines the task of training future specialists, determines the content, complex of methods, forms, learning technologies, etc. It is important that while implementing the specified pedagogical conditions, the productive means and methods of the educational activity of education students are replaced by reproductive ones, providing opportunities for the implementation of creative learning (work on creative and scientific projects, searching for ways to solve non-standard, non-traditional tasks, active participation in the scientific and research activities, development of models, search for new creative methods, methods, use of different-level means of monitoring the educational achievements of students, etc.). The teacher of the pedagogical institution of higher education should take responsibility for ensuring the transition of students from reproduction to dialogue, searching, productive forms and methods of work, for purposeful, step-by-step actions in the process of developing the creativity of future teachers.

In addition, this pedagogical condition provides for the justification of the technology of selecting and structuring the content of the creative development of future teachers in the process of their professional training, the identification of the principles of its selection, the selection of the content lines and levels of structuring.

The group of experts singled out «*increasing the motivation for creative development and self-development of students*» as a pedagogical condition for developing creativity of future teachers of rank No. 5. The authors see the implementation of the pedagogical conditions in the process of the professional training of future teachers in taking into account motives, interests, inclinations, personality qualities (attention, memory, imagination, activity, initiative, inquisitiveness, diligence, etc.), the need for self-realization, self-development, self-regulation. At the same time, the formation of such qualities as self-confidence, perseverance, awareness of the importance of developing one's own creativity in the professional activity is important. Fulfillment of the specified condition is connected with the achievement of the appropriate level of development of motivation and readiness for innovations in the professional activity, acceptance of one's own creative possibilities, incentives for behavior, personal significance (Tan et al., 2018).

Thus, the implementation of the defined pedagogical conditions for developing creativity of future teachers involves the actualization of the student's awareness of motivation regarding the development of their own creativity in the process of the professional training, the formation of motivation and readiness for innovations in the professional activity, acceptance of their own creative opportunities as a life value, etc.

Methodology

In the process of research, we used the following methods:

- theoretical: comparative analysis of philosophical, psychological and pedagogical literature, normative documents, familiarization with domestic and foreign experience of developing the creativity of future teachers; theoretical forecasting;
- empirical: survey, testing, expert evaluation method, conversation; pedagogical experiment;
- statistical: Pearson test (χ^2), correlation analysis.

The search for the pedagogical conditions for developing the creativity of the future specialists was carried out in several stages with the focus on mastering by the education students the high level of creative pedagogical activity, based on

the principles and factors of developing this phenomenon.

The first stage of the search for the pedagogical conditions for developing the creativity of future teachers required the solution of the following task: on the basis of the theoretical analysis of the specified problem and considerable own

experience in teaching activities in higher education, to determine the system of the pedagogical conditions to enable the effective process of developing the investigated personality quality. As a result, 15 pedagogical conditions were selected, which, after clarification and refinement, were submitted to Table 1.

Table 1.
Pedagogical conditions for developing future teachers creativity

#	Pedagogical condition	Amount of choices
1	Involving students into designing creative projects during the study of each discipline of the educational programme for training future teachers	4
2	Active involving members of the scientific problem groups to university and inter-university research activities	6
3	Creating favorable educational environment focused on the development of creativity of higher education students	13
4	Differentiation of the research and creative activities of future teachers depending on their personal aptitude for creativity	7
5	Increasing the motivation for the creative development and self-development of students	11
6	Providing future teachers with the access to all the available information sources, including the foreign ones	5
7	Filling the theoretical and practical components of the professional training of future teachers with the content aimed at the development of their creativity	11
8	Purposeful use of the creative methods, techniques, technologies, innovative forms of their organization in classes	9
9	Financial support of the creative projects of applicants	4
10	Applying innovative learning technologies in the professional training of future teachers	17
11	Improving the forms and methods of monitoring the educational achievements of higher education students in the aspect of taking into account the creativity component	6
12	Implementing the elements of developing the creativity of future teachers in the system of distance learning in the conditions of quarantine and martial state restrictions	9
13	Directing the activity of higher education students towards productive learning, which is the basis of creativity development	6
14	Purposeful developing the personal creative qualities of education students	13
15	Orientation of the educational process to purposeful developing the creativity of every higher education student	9

Source: created by the author

The second stage of the selection of the pedagogical conditions, the implementation of which in the educational process of a higher school will enable the development of the creativity of future teachers, was aimed at selecting the five most significant ones from the given list. 11 teachers from different regions of Ukraine were involved in the expert group.

While selecting the experts, the following requirements were met: work experience in the system of training future teachers; satisfactory state of physical and mental health (absence of irritability, pessimism, insincerity); confidence in one's own judgments, adherence to moral principles; intellectual productivity; present sense of social responsibility, etc.

As a result, the experts selected the 5 most important pedagogical conditions for developing the creativity of future teachers in the process of their professional training: purposeful developing the personal creative qualities of education students (**P1**); creating the favourable educational environment, focused on the development of creativity of higher education students (**P2**); applying the innovative teaching/learning technologies in the professional training of future teachers (**P3**); increasing the motivation for the creative development and self-development of students (**P4**); filling the theoretical, practical and scientific components of the professional training of future teachers with content aimed at developing their creativity (**P5**).

It should be noted that among the selected pedagogical conditions for developing future teachers' creativity there are the main (dominant) ones that should be given primary attention. To assess the importance of the selected pedagogical conditions the expert assessment sheet was designed and the experts ranking was conducted.

Results and Discussion

The results of the expert assessment of the pedagogical conditions for developing creativity of future teachers in the process of their professional training are presented in Table 2.

Table 2.

Matrix of the results of ranking the pedagogical conditions for developing creativity of future teachers in the process of their professional training

NO of expert	P1	P2	P3	P4	P5	Total
1	3	2	1	5	4	15
2	4	2	1	5	3	15
3	4	1	3	2	5	15
4	3	2	1	5	4	15
5	2	3	1	4	5	15
6	3	1	2	4	5	15
7	1	2	3	5	4	15
8	3	4	1	5	2	15
9	3	5	2	1	4	15
10	4	2	1	5	3	15
11	2	3	1	4	5	15
Total	32	28	17	45	43	165
Rank	3	2	1	5	4	

Source: created by the author

Data analysis shows that as a result of the work of the expert commission, relatively reliable results were obtained: the difference between the

smallest and largest sums of ranks is $45-17=28$. The ranking matrix will look like this (Table 3):

Table 3.

Matrix of ranking

Pedagogical conditions	Experts											Sum of ranking	d	d ²
	1	2	3	4	5	6	7	8	9	10	11			
P ₁	3	4	4	3	2	3	1	3	3	4	2	32	-1	1
P ₂	2	2	1	2	3	1	2	4	5	2	3	28	-5	25
P ₃	1	1	3	1	1	2	3	1	2	1	1	17	-16	256
P ₄	5	5	2	5	4	4	5	5	1	5	4	45	12	144
P ₅	4	3	5	4	5	5	4	2	4	3	5	43	10	100
Total	15	15	15	15	15	15	15	15	15	15	15	165	0	526

Source: created by the author

$$\text{where } d = \sum x_{ij} - \frac{\sum \sum x_{ij}}{n} = \sum x_{ij} - 33$$

Checking the correctness of composing the matrix based on calculating the checksum is the following:

$$\sum x_{ij} = \frac{(1+n)n}{2} = \frac{(1+5)5}{2} = 15 . \text{ The}$$

sum of the columns of the matrix and the checksum are equal, so no errors were made when compiling the matrix. We will conduct the analysis of the significance of the studied pedagogical conditions for developing creativity of future teachers, for which we will compile the corresponding table. The location of the pedagogical conditions by importance is presented in table 4:

Table 4.
The location of pedagogical conditions by their importance

Pedagogical conditions	P ₃	P ₂	P ₁	P ₅	P ₄
Sum of ranking	17	28	32	43	45

Source: created by the author

The consistency of experts' opinions regarding the ranking of the studied pedagogical conditions was determined by calculating the concordance coefficient proposed by M. Kendell and B. Smith (Sydorenko & Dmytrenko, 2000). The coefficient is calculated according to the following formula:

$$W = \frac{12S}{m^2(n^3 - n)},$$

$$S = \sum_{j=1}^n \left(\sum_{i=1}^m \frac{\sum_{j=1}^n \sum_{i=1}^m x_{ij}}{n} \right)^2,$$

where n – number of experts, m – number of pedagogical conditions.

In our case $S = 526$; $n = 5$; $m = 11$.

$$\text{Then } W = \frac{12 \cdot 526}{11^2(5^3 - 5)} = 0,434.$$

The coefficient of concordance $W = 0,434$ means that the agreement of the opinions of experts has an average degree, since the continuum of values of the concordance coefficient is in the range from 0 to 1: with the complete disagreement of the opinions of experts $W = 0$; with the complete

unity of experts' opinions $W = 1$. Therefore, based on the value of the concordance coefficient W , it can be concluded that the experts' opinions are average consistent.

To assess the significance of the concordance coefficient W , the Pearson consistency criterion was used, according to which:

$$\chi^2 = \frac{12S}{mn(n+1)} = n(m-1)W$$

In our case

$$\chi^2 = 11(5-1) \cdot 0,434 = 19,10$$

Comparing the calculated χ^2 with the table value for the number of degrees of freedom $k = n-1 = 10-1 = 9$ at the level of significance $\alpha = 0,05$, it can be noticed that the received $\chi^2 = 19,10$, while the table one is 16,92.

In our case $\chi^2 > 16,92$. It means that $W = 0,434$ is not a random variable, and therefore the obtained results are logical, reliable and can be used in the further researching.

Thus, according to the experts, we have the following results of ranking the pedagogical conditions for developing creativity of future teachers, which are presented in Fig. 1:

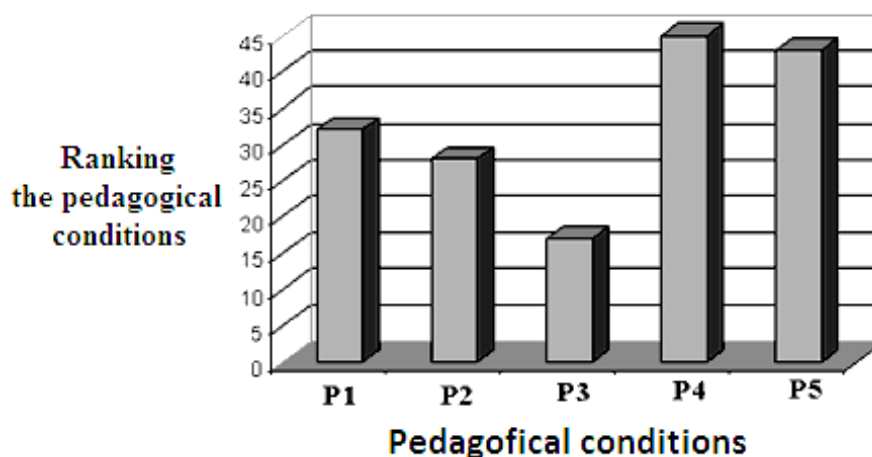


Fig. 1. Ranking the pedagogical conditions for developing the creativity of future teachers.
Source: created by the author

Note:

- purposeful developing personal creative qualities of students (**P1**);
- creating the favourable educational environment, focused on developing the creativity of students of higher education (**P2**);
- applying innovative teaching/learning technologies into professional training of future teachers (**P3**);

- increasing the motivation for creative development and self-development of students (**P4**);
- filling the theoretical, practical and scientific components of the professional training of future teachers with the content aimed at developing their creativity (**P5**).

According to the results of ranking, we have a hierarchy of the pedagogical conditions for developing the creativity of future teachers (Table 5).

Table 5.
Ranks of pedagogical conditions for developing creativity

Rank	Pedagogical condition
1	Applying innovative teaching/learning technologies in the professional training of future teachers (P3)
2	Designing favourable educational environment focused on developing creativity of higher education students (P2)
3	Purposeful developing personal creative qualities of students (P1)
4	Filling the theoretical and practical components of the professional training of future teachers with the content aimed at developing their creativity (P5)
5	Increasing the motivation for students' creative development and self-development (P4)

Source: created by the author

It should be noted that the pedagogical conditions selected by the experts effectively influence the process of developing the creativity of future teachers in the process of their professional training in the higher education institution.

Conclusions

The effectiveness of the implementation of the system of purposeful development of the creativity of future teachers in the process of their professional training is possible provided that certain pedagogical conditions are observed, which will contribute to the organization of purposeful activities of all the participants of the educational process of the pedagogical institutions of higher education, aimed at solving the specified problem.

Selecting such pedagogical conditions was made in several stages. At the first stage, the expert group determined the system of the pedagogical conditions that would enable the effective process of developing the studied personality quality, based on the theoretical analysis of the defined problem and considerable own experience of pedagogical activities in higher education (15 pedagogical conditions were selected).

At the second stage, the 5 most important pedagogical conditions for developing creativity

of future teachers in the process of their professional training were selected: purposeful developing personal creative qualities of education students (**P1**); creating the favourable educational environment, focused on developing creativity of students in higher education (**P2**); applying innovative learning technologies in the professional training of future teachers (**P3**); increasing the motivation for creative development and self-development of higher education students (**P4**); filling the theoretical, practical and scientific components of the professional training of future teachers with the content aimed at developing their creativity (**P5**).

At the third stage, ranking the five most important conditions took place, and the consistency of experts' opinions regarding ranking the studied pedagogical conditions was determined by calculating the concordance coefficient suggested by M. Kendell and B. Smith.

The fourth stage of selecting the pedagogical conditions – determining their ranks (application of innovative teaching/learning technologies in the professional training of future teachers (**P3**) – **rank 1**, creating the favourable educational environment focused on developing creativity of higher education students (**P2**) – **rank 2**, purposeful developing education students' personal creative qualities (**P1**) – **rank 3**, filling

the theoretical and practical components of the professional training of future teachers with the content aimed at developing their creativity (P5) – rank 4, increasing the motivation for the creative development and self-development of education students (P4) – rank 5).

The further insights into the research can be seen in substantiating the factors for developing creativity of future teachers, creating and implementing the system for developing creativity of future teachers in the educational process of the pedagogical university, the search for effective forms, methods and technologies of the specified process, etc.

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