

# Formation of the Professional and Pedagogical Image of a University Teacher as a Condition for Education for Sustainable Development

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**Abstract:** The formation of one's image, the ability to interpret messages, to get to know a person is a task to be solved during the self-education and professional development of a university teacher. Theoretical consideration of the issue of the formation of a teacher's professional and pedagogical image proved the necessity of using self-education to train personal and professional abilities and skills, as well as carrying out the necessary specialized activities. The development of imageology as an independent scientific area, the increased interest of various specialists in applied image technologies, the need to train a teacher with a high level of pedagogical competence and culture, and an increase in the social prestige of the teaching profession in modern society led to the emergence of pedagogical imageology, which studies the process of forming a pedagogical image in terms of professional socialization of educators. The effectiveness of the implementation of sustainable pedagogical conditions in the formation of the teacher's professional and pedagogical image was monitored following the assessment of the development dynamics of three basic criteria indicators for assessing the formation of the professional and pedagogical image, namely, motivational, cognitive, and reflexive.

**Keywords:** Professional and pedagogical image, motivational criterion, cognitive criterion, reflexive criterion, formative experiment, ascertaining experiment, motives of pedagogical activity.

## INTRODUCTION

Modern standards of higher education determine one of the important and sought-after components that increase the effectiveness of pedagogical activity – a professional image of a teacher. It is a significant condition of sustainable development. The significance of the formation of the teacher's professional image, which contributes to the effectiveness of the professional activity, and affects its perception by other participants of the educational process, is actualized. During the formation of the professional image of a teacher in terms of education standardization, appropriate organizational and pedagogical conditions must be provided. The teacher's image is an important aspect of his professionalism and a means of pedagogical influence on students. It is revealed in two ways: firstly, in terms of the requirements for the teacher from the society; secondly, from the position of the teacher – the way he wants to present himself to students and how he wants to establish himself in society.

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Scientists have been researching the issue of the formation of university teachers' professional image for many years. Thus, Kogan (1975) emphasized that students who study in an atmosphere of high respect for the teacher tend to be more willing to acquire knowledge.

This opinion was also confirmed by Emenogu (2005), who argued that poor working conditions, heavy workload, low pay, low social and public image, the contemptuous attitude of colleagues, as well as ingratitude shown to the teacher by parents and the public in general lead to the development of teacher's low morale and the lack of motivation for development.

The idea was further developed by Iliya and Simdet (2013), who concluded that, firstly, the perception of the teacher by parents affects the academic performance of students; secondly, the attitude of the government and employers towards teachers affects the success of students; thirdly, students' attitude towards the teacher has a great influence on students' success.

Thus, today there are several psychobehavioral types of teachers as educators: "Mont Blanc", "Chinese wall", "Loca-

tor”, “Hamlet”, “Grouse”, “Perpetual students”, “Old salt”, and “Random people” (Bulakh I. S., Dolynska L. V., 2002; Levkina R., Levkin A. and Rysnyanska A., 2018).

Teachers use a special kind of knowledge – this knowledge is neither theoretical regarding learning, teaching, and curriculum theories, nor practical regarding students’ knowledge. The teacher’s special knowledge consists of both types of knowledge mixed with the teacher’s characteristics and the way of expression in specific situations. The idea of “image” is one of the forms of personal practical knowledge, as Clandinin (1985) called this special practical knowledge of teachers.

Brown, L., Fernandez, C., Helliwell, T., & Llinares, S. explore the conceptual foundations and practical techniques of imageology. Philosophers, psychologists and scientists such as A. Furnham, G. Hyde, and G. Tritsky (2013), Vashak, Martirosyan and Fedorenko (2020) are engaged in a scientific study of the image issue in terms of social and philosophical research. European scientists Grecu, Hascher and Adjar (2019) have long emphasized the importance of image formation in professional activities.

Nowadays, socialization is an important element, which most common tool is the use of social networks. Socialization through social media is largely done by the exchange of images, which contributes to the culture of the visual and to the transformation of the way of communication, as well as to the perception and creation of personal identity and self-perception. Moral and Díaz (2021), Kali, Baram-Tsabari and Schejter (2019) considered such issues.

Over time, new issues have appeared in the field of higher education, in particular, the spread of the concept of sustainable development (Gryshova I. *et al.*, 2017, 2019, 2022). In particular, Stratilová and Surynková (2022) are engaged in the study of these issues. In their research, they analysed innovative learning tools used to support and improve education for the benefit of sustainable development as a case study of a popular Czech educational website. Karagozlu (2021) deals with the issues of creating a sustainable educational environment using augmented reality technology.

Various aspects of the conditions for the formation of education for sustainable development are considered by world-renowned scientists. Thus, Meng-Chun Chin J., Ching G.S., Castillo del F., Wen T.-H., Huang Y.-Ch., Castillo del C.D., Gungon J.L., and Trajera Sh.M. note that “for remote education to be sustainable, teachers need ongoing professional development, as well as adequate logistical support” [18]. The issue of teacher digital competence standards in higher education is raised in the research of Basantes-Andrade A, Casillas-Martín S, Cabezas-González M, Naranjo-Toro M, and Guerra-Reyes F. [19]. The study of critical reflection on online teaching for sustainability is considered in the work of McKeown R., Down L.

Rethinking the approaches to constructing the content of the educational process becomes the priority direction of the teacher’s professional activity. Personal and individual characteristics, pedagogical value attitudes, and the teacher’s readiness for creative search in the implementation of innovations in the field of higher education influence the atmosphere in which pedagogical interaction takes place and,

therefore, the success of training highly qualified specialists to meet the requirements of employers, and, as a result, provide sustainable development. The necessity of forming a new style of teacher’s activity, which corresponds to the tasks of the current stage of social development, leads to the actualization of problems related to the formation of the individual pedagogical image of the teacher.

The current situation in the educational practice of higher education institutions allows us to state the aggravation of the contradiction between the requirements imposed by modern society on the teacher’s pedagogical image and the practical significance of its implementation in the educational process of higher education institutions. The effort to resolve these contradictions determines the relevance of scientific research, which consists in identifying and substantiating the basic conditions for the formation of the professional and pedagogical image of the university teacher that allow him to effectively carry out professional activities in terms of pedagogical innovations to foster sustainable development of education and, as a result, of society.

## METHODOLOGY

The main conditions for the success of the process of forming the professional and pedagogical image of the university teacher are, firstly, the formation of motivation for professional and pedagogical activity, secondly, the creation of a self-educational environment aimed at forming a complex of teachers’ image-forming knowledge and skills, and, thirdly, reflexive activation and self-organization of the subject in pedagogical activity. In the process of implementing the specified conditions into the self-education process, a comprehensive reflection of the effectiveness and feasibility of the introduced conditions and proposed types of activities was carried out, and a critical evaluation of the teacher’s work program was considered (Khomulenko, T. B., 2005).

A pedagogic experiment, which lasted 2 years, was prepared and conducted, to test the hypothesis regarding the success of the process of the formation of the professional and pedagogical image of the university teacher.

100 Ukrainian university teachers who have 3 or more years of teaching experience participated in the study. Experimental and control groups with an equal number of participants were formed. The experiment had two stages – ascertaining and confirmative. For the experimental group, such diagnostic tools as questionnaires, surveys, trainings on pedagogical skills, and keeping a pedagogical diary were used.

Due to the developed criteria for assessing the level of the formation of the professional and pedagogical image components and the corresponding indicators, the dynamics of the development of the structural image components were monitored and changes in the motivational, cognitive, and reflexive spheres of professional culture were tracked.

At the ascertaining stage of the experiment, the levels of the formation of each criterion in the control and experimental group of teachers were determined. A questionnaire, as well as additional tests and evaluation methods, were used as the main tools for diagnosis.

**Table 1. Motives of pedagogical activity (in %).**

Motives	The Ascertaining Stage		The Confirmative Stage	
	Control Group (CG)	Experimental Group (EG)	CG	EG
Getting monetary reward	45,7	38,0	44,1	15,0
Further career progression	34,0	30,2	35,2	21,2
Trying to avoid criticism from the management and colleagues	17,3	21,0	17,5	9,6
An attempt to avoid possible punishments and troubles	15,0	9,2	16,1	4,8
The need to achieve social prestige and respect from peers	35,0	39,6	34,3	54,2
Getting satisfaction from the process and results of work	21,5	22,1	22,0	45,6
The possibility of the most complete self-realization in the chosen activity	31,0	25,8	30,9	47,0

**Table 2. Motives of pedagogical activity (ranking results).**

Motives	The ascert. stage		The confirm. stage	
	CG	EG	CG	EG
Getting monetary reward	7	6	7	3
Further career progression	5	5	6	4
Trying to avoid criticism from the management and colleagues	2	2	2	2
An attempt to avoid possible punishments and troubles	1	1	1	1
The need to achieve social prestige and respect from peers	6	7	5	7
Getting satisfaction from the process and results of work	3	3	3	5
The possibility of the most complete self-realization in the chosen activity	4	4	4	6

The ascertaining stage of the experiment was aimed at establishing the actual state and level of psychological and pedagogical features of the teachers’ group at the time of the research.

The confirmative stage of the pedagogical experiment was aimed at proving, due to which factors it was possible to achieve the necessary results in the formation of the teacher’s professional and pedagogical image.

We monitored the effectiveness of the implementation of pedagogical conditions for the formation of the teacher’s professional and pedagogical image due to the assessment of the dynamics of the development of indicators of three basic criteria for evaluating the formation of the professional and pedagogical image – motivational, cognitive, and reflexive.

**RESULTS**

Regarding the success of measures for the formation of the *motivational criterion* indicators, it is worth noting that the results of the confirmative experiment testify that a significant number of teachers emphasized the importance of the motivational direction of self-education and noted positive changes in their attitude to professional activity. At the ascertaining stage, a question, among others, was asked: “*What are the main motives of your pedagogical activity?*”.

A comparison of respondents’ answers at the beginning and the end of the experiment is presented in Table 1.

To establish a correlation between the variables regarding the motives of pedagogical activity before and after the experiment, we used Kendall’s rank correlation coefficient (Borysenko O. D., Mayboroda R.Ye., 2000), which is a measure of the relationship between two variables measured by rank scales. Table 2 presents the results of ranking the motives of the pedagogical activity, and Table 3 shows the calculated Kendall’s correlation coefficients and their significance (in italics).

The analysis of Table 3 proves that we got a significant correlation between the experimental and control groups before the experiment, the corresponding Kendall’s rank correlation coefficient was 0,905 ( $p < 0,01$ ). In the context of our study, it means that the hierarchies of motives for pedagogical activity in the control and the experimental groups before the experiment are identical. After the experiment, we did not get a significant correlation between the experimental and control groups, Kendall’s coefficient was 0,333 ( $p > 0,05$ ). Thus, significant changes in motivation were observed in the experimental group. In the control group, after the experiment, no significant differences in motivation were found.

Comparing the results of the survey among the teachers of the control and experimental groups at the ascertaining and

**Table 3. Correlation of Kendall's group hierarchies of motives for pedagogical activity.**

	EG before	CG before	EG after	CG after
EG before		0,905**	0,524	0,810*
		0,004	0,099	0,01
CG before	0,905**		0,429	0,905**
	0,004		0,176	0,004
EG after	0,524	0,429		0,333
	0,099	0,176		0,293
CG after	0,810*	0,905**	0,333	
	0,01	0,004	0,293	

Note: \*\* is the correlation significant at the 0.01 level; \* is the correlation significant at the 0.05 level.

confirmative stages of the experiment, we see a significant increase in motivation in the latter and static indicators in the former. Thus, the respondents from the experimental group showed the greatest tending towards such motives of professional activity as “the need to achieve social prestige and respect from peers” (54.2%), “getting satisfaction from the process and results of work” (45,6%), “the possibility of the most complete self-realization in the chosen activity” (47,0%). Significant differences in the percentage ratio between the choices of teachers from experimental and control groups prove the success and effectiveness of the implemented system of measures for the formation of the motivational component of the professional and pedagogical image, namely, the motivationally oriented training “The professional and pedagogical image of the teacher”. In particular, the correction of the state of the motivational sphere of the experimental group increased the popularity of such choices as “getting satisfaction from the process and results of work” – 22,0% (CG) and 45,6% (EG) and “the possibility of the most complete self-realization in the chosen activity” – 30,9% (CG) and 47,0% (EG). The obtained results indicate positive changes in the understanding of the essence of professional motivation.

Along with other components of the motivational criterion, teachers’ value orientations, which determine their personal and professional paths were also subject to adjustment. We present comparative survey data on the value orientation of the control and experimental groups at the beginning and the end of the experimental work. The teachers of both groups were asked the question “What values are you oriented at?”. The answers are drawn in Table 4.

To compare the results in the experimental and control groups, we scored the statistical Fisher  $\phi^*$  criterion (Vdovenko V. V., 2017), which evaluates the reliability of the recognition of two hundred shares of two samples, in which the effect we are interested in is registered. The criterion is calculated by the formula:

$$\phi^* = (\varphi_1 - \varphi_2) \cdot \sqrt{\frac{n_1 \cdot n_2}{n_1 + n_2}}$$

$$\varphi = 2 \cdot \arcsin \sqrt{p}$$

**Table 4. Teachers’ value orientations (y %).**

Values	The Ascertaining Stage		The Confirmative Stage	
	CG	EG	CG	EG
Life	35,0	42,8	34,6	56,2
Human	5,7	6,0	5,1	17,8
Beauty	48,0	51,3	48,2	53,4
Health	22,1	16,0	23,0	45,9
Motherland	4,5	6,2	4,4	10,2
Labour	11,6	10,5	11,3	38,4
Wealth	53,0	51,4	54,7	41,2
Family	15,4	17,0	15,0	21,3
Peace	10,7	8,3	11,0	14,6
Love	41,0	44,6	41,2	55,0
Career	14,0	16,2	15,1	26,9
Popularity	53,0	51,4	52,7	43,5

where  $\varphi_1$  is the angle corresponding to the smaller percentage share;

$\varphi_2$  is the angle corresponding to the larger percentage share;

$n_1$  is the number of observations in sample 1;

$n_2$  is the number of observations in sample 2.

Note: The critical value of Fisher’s  $\phi^*$  criterion ( $p \leq 0,05$ ) is 1,64. The critical value of Fisher’s  $\phi^*$  criterion ( $p \leq 0,01$ ) is 2,31. The critical value of Fisher’s  $\phi^*$  criterion ( $p \leq 0,001$ ) is 2,81. The results of the calculations are presented in Table 5.

**Table 5. Comparison of value orientations of controls and experimental groups according to Fisher’s  $\phi^*$  criterion.**

Values	Comparison of CG and EG at the ascertaining stage	Comparison of CG and EG at the confirmative stage
Life	1,650*	4,487***
Health	1,530	4,940***
Beauty	0,603	1,006
Labour	0,633	6,772***
Wealth	0,402	2,827***
Career	0,564	2,999***

Note: \* indicates that differences between percentages are significant at the 0.05 level;

\*\* – at the level of 0.01, \*\*\* – at the level of 0.001.

The results of the calculations indicate a statistically insignificant difference between the control and experimental groups before the experiment at the 0,05 level for all indicators (values), except for “life” (the empirical value of the criterion 1,650 exceeds the critical 1,64), and, conversely, a statistically significant difference between indicators of the experimental and control groups after the experiment for all indicators, except for “beauty” (the empirical value of the criterion 1,006 does not exceed the critical 1,64).

The data of the confirmative experiment enabled us to assert the availability of significant changes in the value orientations of the teachers of the experimental group towards universal and humanistic ones, as opposed to the tendency to preserve the percentage ratio in the choices of the respondents of the control group.

To compare the results of ascertaining and confirmative experiments, we used the Kolmogorov-Smirnov  $\lambda$  criterion (Vdovenko V. V., 2017), which allows us to compare two empirical distributions and draw a conclusion about whether they are consistent with each other. We will provide brief information on calculations based on this criterion.

The Kolmogorov-Smirnov  $\lambda$  criterion is designed to compare two distributions: empirical and theoretical, for example, uniform or normal, and one empirical distribution with another empirical distribution. The criterion makes it possible to find the point at which the sum of accumulated differences between two distributions is the largest and to estimate the reliability of this difference.

If in the  $\chi^2$  method, the frequencies of two distributions are compared separately for each digit, here first, the frequencies for the first digit are compared, then for the sum of the first and second digits, then for the sum of the first, second, and third digits, and so on. So, we match the accumulated frequencies to the appropriate digit each time.

If the differences between the two distributions are significant, then at some point the difference in accumulated frequencies will reach a critical value and we will be able to recognize the differences as statistically significant. Tested hypotheses are as follows: H0 – the differences between the

two distributions are unreliable; H1 – the differences between the two distributions are significant.

We will describe the algorithm for calculating the  $\lambda$  criterion when comparing two empirical distributions (Vdovenko V. V., 2017):

1. In the table, enter the names of the character categories (first column) and their corresponding empirical frequencies obtained in distribution 1 (second column) and distribution 2 (third column).
2. Calculate the empirical frequencies for each digit for distribution 1 using the formula:

$$f^*e = fe/n_1$$

where  $fe$  is the empirical frequency in this discharge;

$n_1$  is the number of observations in the sample.

Enter the empirical frequencies of distribution 1 in the fourth column.

3. Calculate the empirical frequencies for each digit for distribution 2 according to the formula:

$$f^*e = fe/n_2$$

where  $fe$  is the empirical frequency in this discharge;

$n_2$  is the number of observations in the second sample.

Enter the empirical frequencies of distribution 2 in the fifth column of the table.

4. Calculate the accumulated empirical frequencies for distribution 1 using the formula:

$$\sum f^*_i = \sum f^*_{i-1} + f^*_i$$

where  $\sum f^*_{i-1}$  is the frequency accumulated on previous discharges;

$i$  is the sequence number of the digit;

$f^*_i$  is the frequency of this bit.

Record the results in the sixth column.

5. Calculate the accumulated empirical frequencies for distribution 2 using the same formula and record the result in the seventh column.
6. Calculate the difference between the accumulated frequencies for each digit. Write the absolute values of the difference without their sign in the eighth column. Indicate them as  $d$ .
7. Determine the largest absolute value of the difference  $d_{max}$  by the eighth column.
8. Calculate the value of the criterion according to the formula:

$$\lambda = d_{max} \sqrt{\frac{n_1 \cdot n_2}{n_1 + n_2}}$$

where  $n_1$  is the number of observations in the first sample;

$n_2$  is the number of observations in the second sample.

**Table 6. Comparison of measurements according to the motivational criterion in the control and experimental groups before the experiment according to the Kolmogorov-Smirnov  $\lambda$  criterion.**

Levels	Empirical Frequencies		Empirical Frequencies		Accumulated Empirical Frequencies		Difference
	f <sub>1</sub>	f <sub>2</sub>	f <sub>1</sub> *	f <sub>2</sub> *	$\Sigma f_1^*$	$\Sigma f_2^*$	$\Sigma f_1^* - \Sigma f_2^*$
High	21	22	0,103	0,109	0,103	0,109	0,006
Middle	67	60	0,330	0,297	0,433	0,406	0,027
Low	115	120	0,567	0,594	1	1	
Total	203	202	1	1			
						dmax=	0,027
						$\lambda_{emp}$ =	0,272

**Table 7. Comparison of measurements according to the motivational criterion in control and experimental groups after the experiment according to the Kolmogorov-Smirnov  $\lambda$  criterion.**

Levels	Empirical Frequencies		Empirical Frequencies		Accumulated Empirical Frequencies		Difference
	f <sub>1</sub>	f <sub>2</sub>	f <sub>1</sub> *	f <sub>2</sub> *	$\Sigma f_1^*$	$\Sigma f_2^*$	$\Sigma f_1^* - \Sigma f_2^*$
High	23	50	0,113	0,248	0,113	0,248	0,135
Middle	67	115	0,330	0,569	0,443	0,817	0,374
Low	113	37	0,557	0,183	1	1	
Total	203	202	1	1			
						dmax=	0,374
						$\lambda_{emp}$ =	3,763

If  $\lambda_{emp} \geq 1,36$ , the differences between the distributions are significant at the  $p < 0,05$  level. If  $\lambda_{emp} \geq 1,63$ , the differences between the distributions are significant at the  $p < 0,01$  level. The results of the calculations according to the algorithm described above are shown in Tables 6 and 7.

Therefore, the empirical value of the  $\lambda_{emp}=0,272$  criterion is less than the critical value of 1,36, so the differences between the control and experimental groups before the experiment are insignificant ( $p>0,05$ ).

As we can see, the empirical value of the criterion  $\lambda_{emp} = 3,763$  exceeds the critical value of 1,63, so the differences between the control and experimental groups after the experiment are significant at the  $p < 0,01$  level.

Along with the evaluation of the effectiveness of the implemented conditions for the formation of the indicators of the motivational criterion throughout the experiment and at the confirmative stage, monitoring of the effectiveness of the introduction of pedagogical conditions for the development of the cognitive criterion for assessing the state of teachers' pedagogical culture within professional and pedagogical image took place. As already mentioned, the cognitive component of teachers' professional and pedagogical image needs confirmative work in such areas as the development of professional competence and erudition, pedagogical reflection, pedagogical goal setting, pedagogical thinking and improvisation, and pedagogical communication; improvement of professionally significant and personal qualities; as well

as the formation and improvement of teaching techniques of university teachers.

Among the main tasks related to the adjustment and development of the cognitive component of the image, we focused on the creation and improvement of image-significant professional and personal qualities of specialists (Mytseva O. S., 2018). The participants of the experiment were asked the following: "What qualities, in your opinion, should there be in the image of a teacher if he wants to achieve professional success?". Table 8 shows the distribution of responses in the control and experimental groups at the beginning and after the completion of the experimental work.

The results of the calculations (Table 9) indicate a statistically insignificant difference between the control and experimental groups before the experiment at the 0.05 level for all indicators (values) and, conversely, a statistically significant difference between the indicators of the experimental and control groups after the experiment for all indicators, except "pedagogical experience" (the empirical value of the criterion 1,026 does not exceed the critical value 1,64).

The presented results surely demonstrate significant progressive changes in the understanding of the essence of pedagogical activity in the experimental group at the confirmative stage of the experiment. Conducted lectures, practical classes, trainings, and work of discussion groups supplemented the knowledge of teachers and became a kind of impetus in further initiative and information search. Concerning the

**Table 8. Qualities necessary for the teacher’s professional and pedagogical image (in %).**

Qualities	Ascertaining Stage		Confirmative Stage	
	CG	EG	CG	EG
Professionalism	32,0	34,5	31,2	48,6
The ability to lead other people	12,4	11,8	12,2	21,1
Communication skills	21,0	22,3	20,0	44,1
Self-confidence	14,2	12,4	13,7	35,2
Pedagogical experience	56,3	58,0	56,0	61,4
Love for students	61,0	59,3	58,3	62,2
Modern image	8,3	9,6	8,6	87,4
Broad erudition	10,2	11,0	11,0	43,3
Moral resilience	5,2	6,0	5,7	12,5

**Table 9. Comparison of the qualities necessary for the professional success of a teacher, according to the answers of the control and experimental groups by Fisher’s  $\phi^*$  criterion.**

Qualities	Comparison of CG and EG at the Ascertaining Stage	Comparison of CG and EG at the Confirmative Stage
Professionalism	0,634	3,723***
Communication skills	0,241	5,272***
Pedagogical experience	0,403	1,026
Broad erudition	0,322	7,587***
Modern image	0,352	18,716***

professional and pedagogical qualities inherent in specialists who strive to achieve success in their careers, the priorities were set as follows. At the confirmative stage in the experimental group, the below-listed qualities got the biggest number of choices: professionalism – 31,2% (CG) and 48,6% (EG), communication skills – 20,0% (CG) and 44,1% (EG), pedagogical experience – 56,0% (CG) and 61,4% (EG) and broad erudition – 11,0% (CG) and 43,3% (EG). It is worth noting that 87,4% of representatives of the experimental group and only 8,6% of the control group noted the importance of a modern image in achieving professional success.

The respondents were also asked “*What professionally significant qualities of a teacher do you possess?*” the received answers were summarized in Table 10.

**Table 10. Professionally significant qualities inherent in the respondents (according to the results of self-assessment) (in %).**

Qualities	Ascertaining Stage		Confirmative Stage	
	CG	EG	CG	EG
Kindness	12,3	13,0	11,8	34,0
Tolerance	10,2	11,1	11,1	27,5

Sufficient demandingness	7,3	7,0	7,6	8,9
Elegant look	15,2	14,9	15,3	43,7
Ability to express own thoughts	9,5	10,0	8,8	31,9
Sense of humour	14,5	13,2	14,6	16,4
Optimism	32,1	34,1	33,5	42,1
Emotional balance	42,1	44,1	42,0	45,8
Developed communication and organizational skills	18,0	17,2	16,9	52,0
Empathy	8,3	9,8	8,1	32,4

The results of the calculations (Table 11) indicate a statistically insignificant difference between the control and experimental groups before the experiment at the 0,05 level for all indicators (values) and, conversely, a statistically significant difference between the indicators of the experimental and control groups after the experiment for all indicators, except “emotional balance” (the empirical value of the criterion of 0,815 does not exceed the critical value of 1,64).

We should note a significant increase in the number of choices by all indicators among the teachers of the experimental group, in contrast to the control group.

**Table 11. Comparison of professionally significant qualities inherent in the respondents of the control and experimental groups according to Fisher's  $\phi^*$  criterion.**

Qualities	Comparison of CG and EG at the Ascertaining Stage	Comparison of CG and EG at the Confirmative Stage
Kindness	0,312	5,414***
Ability to express own thoughts	0,352	5,97***
Emotional balance	0,413	0,815
Developed communication skills	0,262	7,657***
Empathy	0,704	6,329***
Elegant look	0,000	6,601***

**Table 12. Subjects/objects of orientation in the process of self-evaluation of one's actions (in %).**

Subjects/objects of Orientation	Ascertaining Stage		Confirmative Stage	
	CG	EG	CG	EG
Parents' opinion	32,0	30,1	31,4	22,5
Friends' opinion	43,4	42,2	44,3	23,1
Own attitude	11,6	11,9	12,3	56,7
The norms accepted in society	5,3	6,0	5,0	24,6
Opinion of competent experts	7,7	9,8	8,2	15,3

**Table 13. Comparison of the results of self-assessment of own actions of the control and experimental groups according to Fisher's  $\phi^*$  criterion.**

Subjects/objects of Orientation	Comparison of CG and EG at the Ascertaining Stage	Comparison of CG and EG at the Confirmative Stage
Parents' opinion	0,443	2,284*
Friends' opinion	0,201	4,538***
Own attitude	0,000	10,103***
The norms accepted in society	0,000	5,997***
Opinion of competent experts	0,704	2,224*

The introduction of the third condition, reflexive activation of teachers, was also accompanied by diagnostic and monitoring procedures aimed at tracking the development dynamics of the relevant indicators of the reflexive criterion. The confirmative stage of the experiment proved the effectiveness of the self-education measures implemented in the system of work and allowed us to assert the need for further development of the activation of teachers in reflexive and evaluation activities. The work on the formation of the reflexive component of the professional and pedagogical image covered the following areas: activation of the subject in the process of goal setting; development of self-psychological competence (skills of self-analysis, self-education, and self-design); reflexive activation of the teacher in the process of self-analysis; formation of an adequate I-concept.

Among other contradictions that were subject to consideration and reflection, the proposed training was focused on the problems of evaluating one's actions, which turned out to be

psychologically difficult at the diagnostic stage (Kholod O. M., 2003). At the ascertaining and confirmative stages of the experiment, the respondents were asked the following: "Assessing your actions, what/who are you oriented at?" The survey data are presented in Table 12.

The results of the calculations (Table 13) indicate a statistically insignificant difference between the control and experimental groups before the experiment at the 0,05 level for all indicators and, conversely, a statistically significant difference between the indicators of the experimental and control groups after the experiment for all indicators. As can be seen from the tables, the number of persons who want to focus on their attitude while assessing their actions has significantly increased in the experimental group (56,7% (EG)). This dynamic testifies to a fairly high level of the formation of reflexive skills that allow an individual to adequately rank target orientations in the professional activity. Moreover, the popular choices were "the norms accepted in society" (24,6% (EG)) and "the opinion of competent specialists"



(15,3% (EG)). Such results, in our opinion, are the indicators of the internalization of knowledge about the essence of a teacher’s professional activity, which consists in correlating one’s preferences and aspirations, perfect ideas about the professional “I” with the objective requirements and needs of the social environment.

A comparison of the results obtained at the beginning and the end of the experiment revealed an interesting trend toward shifting the focus from friends and family to introspection and self-reflection. Thus, the number of teachers in the experimental group who, in the process of analysing their actions, focused on the opinion of parents, decreased by 8,9%, according to the opinion of colleagues, by 21,2%, which indicates a higher level of initiative and independence in the process of considering professional and personal actions. At the same time, the survey data show static and only partial changes in the indicators of the reflexive criterion in the control group. In the process of the confirmative experiment, the need for self-education and self-improvement were also among the much discussed. To track the level of formation of the mentioned qualities, a corresponding question was asked at the ascertaining and confirmative stages. In the first stage, 32% of the teachers of the control and 34,2% in the experimental groups responded positively to the question “Do you consider self-education and self-improvement important aspects of personal and professional formation and growth?”. At the end of the experiment, the answers were distributed as follows: 31,2% of the respondents of the control group and 56,2% of the experimental group noted the importance of self-education and continuous self-improvement in the pedagogical reflexive activity.

Regarding the question “Do you usually think about the reasons for your failures?”, we reiterated it to get an answer from the respondents. According to the results of the survey, the number of positive choices in the experimental group increased by 24,7%, while in the control group – by only 0,9%. Therefore, most of the teachers of the experimental group have a persistent desire to reflect on their actions and self-improvement during all stages of professional activity. These conclusions confirmed the information obtained regarding keeping a pedagogical diary, which was a means of expressing thoughts and considering actions during the training “Professional image of a teacher”. After the experiment, 78,9% (as opposed to 48,0% at the beginning of the experiment) of the teachers of the experimental group expressed a positive attitude towards the practice of keeping a diary; the corresponding results in the control group remained almost unchanged (46,4% at the beginning and 45,8% at the end of the experiment).

Another analytical task of the formative stage of the experiment was to compare respondents’ answers to the question “Choose the qualities you would like to get rid of”. The results are presented in Table 14.

**Table 14. Undesirable qualities that hinder the effective professional activity of the teacher (in %)**

Qualities	Ascertaining Stage		Confirmative Stage	
	CG	EG	CG	EG

Impulsiveness	6,6	8,2	5,7	10,3
Irritability	8,9	7,6	8,8	11,4
Self-doubt	11,2	10,1	11,1	23,8
Laziness	48,3	47,8	49,0	50,4
Anxiety	52,3	53,1	51,2	56,9
Narcissism	14,0	13,2	15,6	23,5
Offishness	5,0	6,2	4,8	9,6

The results of the calculations (Table 15) indicate a statistically insignificant difference between the control and experimental groups before the experiment at the 0,05 level for five indicators out of seven, and a statistically significant difference between such indicators of the experimental and control groups as “narcissism”, “self-doubt”.

The presented data make it possible to assert the success of the implemented pedagogical conditions related to the formation of the reflexive component of the teacher’s professional and pedagogical image. Thus, according to the results of the confirmative experiment, the number of teachers in the experimental group with a high level of the formation of indicators of the reflexive criterion increased by 14,2%, with an average level – by 25,6%, and a low level – decreased by 39,8%. In general, the participants of the experimental work noted the significance of the conducted activities, their purposefulness, full coverage of topics and tasks, flexibility, and diversity.

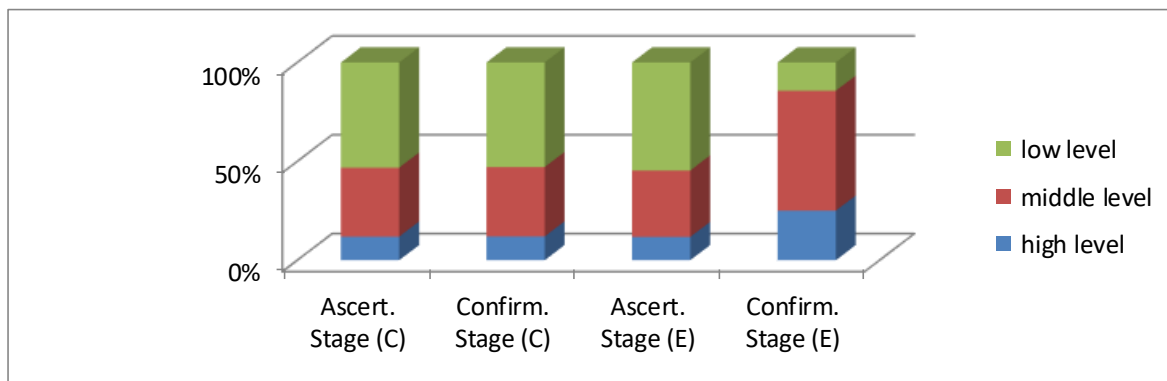
**Table 15. Comparison of undesirable qualities that hinder the effective professional activity of a teacher, according to respondents from control and experimental groups by Fisher  $\phi^*$  criterion.**

Qualities	Comparison of CG and EG at the ascertaining stage	Comparison of CG and EG at the confirmative stage
Impulsiveness	0,795	1,490
Irritability	0,734	0,674
Self-doubt	0,322	3,502***
Laziness	0,000	0,201
Anxiety	0,201	1,207
Narcissism	0,291	1,780*
Offishness	0,442	1,580

The analysis of the conducted experimental work gives reasons to define the process of comparing the levels of the formation of individual components of the image in the control and experimental groups as successful, as can be seen from Table 16 and Figure (according to the Kolmogorov-Smirnov  $\lambda$  criterion), the general indicators of the formation of the teachers’ professional and pedagogical image of the control group are almost no different from those obtained at the first, ascertaining, stage of the experiment, while in the experimental group we observe a noticeable growth of these indicators.

**Table 16.** The results of assessing the levels of indicators' formation according to motivational, cognitive, and reflexive criteria (in %).

Criterion	Formation levels											
	High				Middle				Low			
	Ascertain. stage		Confirm. stage		Ascertain. stage		Confirm. stage		Ascertain. stage		Confirm. stage	
	CG	EG	CG	EG	CG	EG	CG	EG	CG	EG	CG	EG
Motivational	10,2	10,8	11,3	24,6	33,2	29,6	32,8	57,0	56,6	59,6	55,9	18,4
Cognitive	14,2	13,9	13,8	25,7	35,1	33,5	34,5	61,8	50,7	52,6	51,7	12,5
Reflexive	11,3	10,6	10,8	24,8	36,3	37,6	38,1	63,2	52,4	51,8	51,1	12,0
Total average value	11,9	11,8	12,0	25,0	34,9	33,6	35,1	60,6	53,2	54,7	52,9	14,3



**Fig. (1).** Comparison of the levels of the formation of the teachers' professional and pedagogical image according to the results of the ascertaining and confirmative stages of the experiment.

**Table 17.** Comparison of the results of the formation of teachers' professional and pedagogical image of the control and experimental groups at the beginning and the end of the experiment by the Kolmogorov-Smirnov  $\lambda$  criterion.

Criteria	The Empirical Kolmogorov-Smirnov $\lambda$ Criterion	
	CG and EG before the Experiment	CG and EG after the Experiment
Motivational	0,272	3,763**
Cognitive	0,171	3,954**
Reflexive	0,091	3,975**
Average data	0,171	3,954**

Note: The critical value of the  $\lambda$  criterion – the Kolmogorov-Smirnov criterion ( $p \leq 0,05$ ) is 1,36. The critical value of the  $\lambda$  criterion – the Kolmogorov-Smirnov criterion ( $p \leq 1,63$ ). The symbol \* indicates that differences between the distributions are significant at the 0,05 level; \*\* – at the level of 0,01.

The analysis of the calculation results (Table 17) shows a statistically insignificant difference at the level of  $p \leq 0,05$  between the control and experimental groups at the beginning of the experiment according to all criteria (the empirical Kolmogorov-Smirnov  $\lambda$  criterion does not exceed the critical 1,36). Instead, in the comparison of the control and experimental groups at the end of the experiment, significant differences were obtained for all criteria at the level of  $p \leq 0,01$  (the empirical Kolmogorov-Smirnov  $\lambda$  criterion exceeds the critical value of 1,63).

The number of teachers in the experimental group with a high level of the formation of professional and pedagogical image components increased by 13,2%, and the average level – by 27,0%. The number of participants in the experiment with a low level decreased by 40,4%. We associate the obtained results with the organization and introduction of a system of extracurricular activities aimed at providing education for sustainable development into the educational process, which contributed to the maximum development of

each of the components of the professional-pedagogical image.

We believe that the result-and-assessment stage of the experiment proved the success and positive consequences of the implementation of the developed measurement system aimed at the formation and improvement of the professional-pedagogical image in the self-education of university teachers.

The general comparison of the obtained results according to the indicators of motivational, cognitive, and reflexive criteria testifies to the significance of the conducted experiment, its success, and practical value.

## CONCLUSIONS

Thus, totaling the above, we can conclude the following. Due to the correction of the state of the *motivational* criterion of the experimental group, the popularity of such concepts as “getting satisfaction from the process and work results” increased – the indicator in the experimental group increased by 23,5%, and “the possibility of the most complete self-realization in the chosen activity” – the experimental group showed an increase of 24,2%. The obtained results indicate positive changes in the understanding of the essence of professional motivation.

When assessing the *cognitive* criterion of the teacher’s image, progressive changes in the understanding of the essence of pedagogical activity in the experimental group at the confirmative stage of the experiment were studied.

A comparison of the indicators of the cognitive criterion of the formative stage showed the following distribution by components: the greatest number of choices were made for such qualities as professionalism – 31,2% (CG) and 48,6% (EG), communication skills – 20,0% (CG) and 44,1 % (EG), teaching experience – 56,0% (CG) and 61,4% (EG), and broad erudition – 11,0% (CG) and 43,3% (EG). An interesting fact is that 87,4% of the representatives of the experimental group and only 8,6% of the control group noted the importance of a modern image in achieving professional success.

The presented data make it possible to assert the success of the implemented pedagogical conditions related to the formation of the reflexive component of the teacher’s professional and pedagogical image.

The implementation of pedagogical conditions related to the formation of the reflexive component of the teacher’s professional and pedagogical image was shown by the following results of the confirmative experiment – the number of teachers in the experimental group with a high level of the formation of indicators of the reflexive criterion increased by 14,2%, with an average level – by 25,6%, low decreased by 39,8%.

Based on the analysis and assessment of the conducted experimental work, we conclude the following:

1. The formation of a professional and pedagogical image takes place effectively under the condition of activating the motivational, cognitive, and reflexive culture of teachers.

2. The introduction to the self-education process of a specially organized system of activities (questionnaires, surveys, trainings, and keeping a pedagogical diary) is the key to improving the culture of professional activity and the individual image of the teacher
3. The effectiveness of the developed and used research tools was confirmed by the objective results of comparing the levels of the formation of the indicators of each of the criteria and the self-assessment data of the teachers of the experimental group.
4. One of the important and sought-after components that increase the effectiveness of pedagogical activity is the teacher's professional image. It is also a crucial condition for providing education for sustainable development.

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