Inclusivity-Focused Training of Special Education Teachers for General Primary Schools

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ABSTRACT: The inclusion policy in education gives priority to the task of developing an effective inclusive education system, the vocational training of future teachers in higher education based on the competence approach, and the preparation of highly competent specialists who would demonstrate well-developed intellectual, professional, and personal qualities in an innovative educational space. The study aims to substantiate and experimentally test possibilities to develop the social and pedagogical competence of future primary school teachers for work in an inclusive environment of a general education institution. The authors scientifically substantiate and prove the need for pedagogical universities to train students who are ready and able to perform social and pedagogical work in an inclusive class in a general education institution and to develop their social and pedagogical competence for work in an inclusive educational space of a general education school. The conducted pedagogical experiment confirms the hypothesis that the vocational training of future primary school teachers for work in an inclusive school environment provides a high level of development of social and pedagogical competence.

Keywords: inclusive education, teacher professional training, social and pedagogical competence, special educational needs (SEN), competence-based teacher education.

I. INTRODUCTION

At present, it is an important objective to engage children with special educational needs (SEN) in the educational process of primary school [1]. This task requires teachers to restructure their professional practice, take a creative approach to developing the teaching method and methodological support for inclusive education, master innovative technology and special methods for joint education of children with normal development and SEN, and, most importantly, change the psychology of their attitude to working in an inclusive environment and accept and comprehend the new philosophy of education and its humanistic orientation [2]. Psychological and pedagogical science has now developed a variety of approaches to the vocational training of teachers, including primary school teachers. The theoretical and methodological aspects of educational process organization at a pedagogical university have been presented [3]. The introduction of inclusive education in the national space and its organization in higher education institutions, as well as the development of inclusive competence in teachers and caretakers in preschool institutions, have been considered [4-6].

Birot-Gautron et al. [7] notes that inclusive education implies the professional training of an inclusive class teacher or other specialist (remedial educator) in accordance with the needs and abilities of each student. This specialist has to have the required qualifications, provide guaranteed support for those students who need it, and exercise a person-centered approach in their teaching practice. The trend of modernization of education calls for

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the establishment of an educational environment that would enable the school (administration, teachers, and most of the students) to adapt to the needs of each person [8, 9]. Contemporary researchers exploring the organization of inclusive education propose an interpretation of inclusive education as a system of educational services rooted in the principle of guaranteeing children's fundamental right to education [10, 11]. As argued by [12, 13], inclusive education assumes the creation of an educational environment that meets the needs and abilities of each child regardless of their psychophysical development. Markitanova [14] understands inclusive education as the accessibility of education to all and the adaptation of general education to the diverse needs of all children.

The vocational training of future teachers for work in an inclusive school environment is interpreted as specially organized training in a higher education institution that focuses on the development of professional competence, a humanistic stance, inner culture, and professional behavior. These qualities will help the teacher understand children with SEN and competently organize their polyfunctional activity in an inclusive environment of a general education institution [15]. Researchers conclude that as inclusion is introduced into general education institutions as an innovative form of learning, the professional training of teachers in higher education needs to be modernized [16, 17]. Thus, the purpose of this study is to substantiate and experimentally test the opportunities to develop the SPC of future primary school teachers for work in an inclusive environment of a general education institution.

II. RELATED WORK

Analysis of scientific approaches to the organization of the educational environment of vocational training for future primary school teachers determines the theoretical and methodological foundation for the development of their Social and Pedagogical Competence (SPC) for work in an inclusive school environment:

- pedagogical university students are subjects of learning activity in the process of vocational training, the final product of which is the development of SPC [18];
- the content of the educational environment is shaped by interconnected and complementary structural components of the pedagogical process at the pedagogical university, e.g., modification of the educational content of pedagogical disciplines, change of the essence of pedagogical practice without changing its content, targeted research work to investigate the introduction of inclusive education [19, 20];
- the result of vocational training is the development of SPC, which ensures the person's readiness and ability to perform inclusive education of junior schoolchildren in a general education institution [21]. Thus, to ensure the effective work of the faculty of a pedagogical university directed at the professional training of future teachers to work in an inclusive environment of a general education institution, it is necessary to:
- design an innovative pedagogical process in the educational environment of the university that, through purposeful management, will provide a cumulative effect of developing a sufficient level of SPC [22];
- to ensure the humanistic orientation of the content of academic disciplines that would facilitate the development of a highly qualified, socially active person with high moral qualities of a citizen, organically combined with the development of SPC of an individual capable of carrying out multifunctional activities in an inclusive environment of a general education institution [23].

Studies published within the last years only primarily address inclusive teacher training at a descriptive or conceptual level; the present research proposes and empirically tests a structured model for developing SPC in future primary school teachers. The novelty of the study lies in the operationalization of SPC as an integrative construct comprising cognitive, personal, and professional components, each supported by clearly defined criteria and measurable indicators. Unlike previous works that focus on isolated competencies or general readiness for inclusion, this study integrates theoretical principles of inclusive pedagogy and competence-based education into a unified pedagogical system, which is implemented through curriculum integration, targeted instructional methods, and coordinated faculty involvement. The effectiveness of this system is verified through a quantitative pedagogical experiment that enables the assessment of SPC development dynamics using standardized diagnostic tools and statistical hypothesis testing. The conducted analysis demonstrates that, despite the considerable body of research covering the vocational training of teachers, no work has comprehensively disclosed the essence of vocational training of primary school teachers for work in an inclusive environment.

III. MATERIAL AND METHOD

1. RESEARCH DESIGN

To achieve the set research goal, we employed several methods, the most critical of which were the analysis of psychological, pedagogical, scientific, and methodological literature, a questionnaire survey, and a pedagogical experiment. The theoretical background of inclusive pedagogy and competence-based teacher education served as the basis for selecting the structure of social and pedagogical competence and for designing the pedagogical experiment. The cognitive, personal, and professional components of SPC were derived from an analysis of psychological and pedagogical literature and were subsequently translated into specific criteria and indicators used for diagnostics. The primary research method was a pedagogical experiment, which was conducted in the second semester of the 2022-2023 academic year. The experiment proceeded in several stages (Table 1).

Table 1. Stages of the pedagogical experiment.

Stage	Content
Preparatory	Determining the relevance, goal, objective, object, and subject of the experiment.
Organizational	Substantiating the criteria, indicators, and levels of SPC, selecting research methods, preparing methodological support for experimental testing, participant sampling.
Ascertaining	Testing the initial level of SPC component indicators in students for work in an inclusive school environment (observation of students' work in class, testing, surveying).
Formative	Developing the SPC of future primary school teachers for work in an inclusive environment.
Summarizing	Statistical processing of the results (determining the dynamics of SPC indicators in students).

[1] Compiled by authors.

The structure of the SPC of primary school teachers required to work in an inclusive school environment is determined by the basic subject competencies of a primary school teacher, social teacher/worker, and remedial teacher and the competencies of medical work, the content of which is realized through knowledge and skills.

2. DATA COLLECTION

The sample included a total of 411 3rd-year students. The experimental (215 people) and control (215 people) groups (EG and CG) were formed based on pre-existing academic groups. Approximately 65% of the participants were female students, while 35% were male. This gender distribution reflects the typical enrollment pattern in teacher education and other humanities-oriented academic programs, which are traditionally characterized by a higher proportion of female students.

The pedagogical experiment was voluntary for all participants. All of them were informed of the purpose and the course of the study in advance and signed an informed consent form before gathering the data. All data were collected and processed anonymously for research purposes under strict confidentiality guidelines. The criteria and indicators for the components of the SPC of university students training to become inclusive primary school teachers were established based on the conducted analysis of psychological and pedagogical literature. The criteria of SPC were defined as the cognitive, personal, and professional SPC components, and the indicators were the educational elements and personal and professional qualities that disclose the primary parameters of the criteria. The indicators defining the criteria of development were established by the level (degree of development) of SPC.

Table 2. Criteria and indicators of the components of SPC.

Criteria	Indicators
Cognitive component	– mastery of the system of general scientific, psychological, socio-pedagogical, and other specialized professional knowledge necessary for future primary school teachers to perform professional functions in an inclusive environment; – mastery of the prescribed amount of remedial knowledge and mastery of special socio-pedagogical skills and abilities necessary to perform multifunctional socio-pedagogical activities in an inclusive general education school, etc.

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| Personal and professional com-po-nents | – motivational component: the student having inter-est in and a personal striving to work in an inclusive envi-ronment, a desire to apply their knowledge in the chosen professional sphere, which manifests itself in the stabil-ity, depth, and breadth of professional interests and focus;
 – emotional component: the student having the feelings and volitional processes that ensure successful and effi-cient work in an inclusive environment |

[1] Compiled by authors.

The proposed criteria and indicators of the structural components of future teachers' SPC for work in an inclusive school environment formed the foundation of our experimental work. The level of development of the components of students' SPC for work in an inclusive school environment was determined following the diagnostic program described in Table 3.

Table 3. Diagnostic program.

Criteria	Indicators	Source
Cognitive component	a survey of our development determining the level of development of SPC (level of knowledge about working in an inclusive school environment) and a written diagnostic work utilizing the Unfinished Sentences method	[24, 25]
Personal and professional components	T.I. Iliin's method assessing motivation for learning in higher education, V. Boyko's empathy test, D. Campbell's benevolence scale	[26, 27]

[1] Tables may have a footer.

3. EXPERIMENTAL PROCEDURE

The pedagogical experiment was conducted in accordance with the planned research program and was aimed at achieving a high level of development of SPC among future primary school teachers using the developed pedagogical system of their vocational training (integration of academic disciplines, introduction of original methodology for teaching students the academic content of the discipline "Fundamentals of Inclusive Pedagogy" into the university's pedagogical process (problem-based lectures, lectures on the use of schemes, lecture-presentations, socio-pedagogical cases, business games, the brainstorming method, project preparation, etc.), unified pedagogical actions of teachers at all levels of education).

The conceptual basis for the pedagogical experiment included the following provisions:
- The development of future primary school teachers' SPC for work in an inclusive environment was carried out in the framework of an innovative pedagogical process within the sociocultural environment of a pedagogical university;
- The model of SPC development concretized in an appropriate structural and functional form and built on the principles of integrity of the pedagogical process and the synergy of educational and didactic principles can raise the level of development of SPC in future primary school teachers for work in an inclusive environment;
- The vocational training of future primary school teachers for work in an inclusive environment is shaped by the content of the basic disciplines "Fundamentals of Social and Pedagogical Activity" and "Fundamentals of Inclusive Pedagogy";
- The structure of SPC is determined by the modification of the university's sociocultural environment. For this purpose, the content of educational material was perfected and the content of pedagogical practices was modified with consideration of the educational material of inclusive pedagogy. Throughout the pedagogical experiment, the personally and professionally important qualities of students were improved given their characteristics;
- The process of professional training included, among other things, the preparation of faculty members. Methodological seminars were held with the faculty to discuss the problem of preparing future primary school teachers for work in an inclusive environment and developing their SPC: "Social and pedagogical work as an integrated type of social and pedagogical activity", "Social and pedagogical competence of a primary school teacher", "Development of social and pedagogical values in the training of primary school teachers", "Pedagogical correction of significant competencies of the future teacher". Faculty members were also familiarized with the content of training manuals "Fundamentals of Social Pedagogical Activity" and "Fundamentals of Inclusive Pedagogy" so that they could motivate students to social pedagogical activities

in an inclusive school environment as part of lectures and practical-laboratory classes. Open classes and department reports were held, during which the faculty exchanged opinions and solved problem cases.

IV. DATA ANALYSIS

1. ASSESSMENT PROCEDURE AND EVALUATION LOGIC

Assessment of the effectiveness of our method of vocational training of future primary school teachers for work in an inclusive environment and simultaneous development of their SPC required psychological and pedagogical diagnostics before and after deploying the pedagogical system of training these students using this method. The assessment was performed based on the results of the ascertaining and formative stages of the pedagogical experiment subjected to statistical processing. Through this, we established and confirmed the reliability of the dynamics in the development of structural components of SPC.

2. DATA SOURCES AND QUANTITATIVE PROCESSING

Information about the course and results of the experiment was obtained through observation of students' work in class, testing, surveying, and conversations. Quantitative analysis of the results was performed using mathematical statistics methods, as in the ascertaining experiment.

3. STATISTICAL HYPOTHESES AND METHODS OF STATISTICAL ANALYSIS

From a mathematical point of view, this requires formulating the null H0 and alternative H1 statistical hypotheses:

H0: distributions of SPC development levels in the CG and EG of students do not differ from each other;

H1: distributions of SPC development levels in the CG and EG of students differ from each other.

Further processing of the results of the pedagogical experiment was conducted via mathematical statistics methods. The objective was to detect differences in the distribution of a characteristic (level of development of SPC components) when comparing two empirical distributions. For this purpose, we employed Pearson's χ^2 test. Statistical significance was evaluated at the 0.05 level. The assessment scale consisted of three categories corresponding to three values: Sufficient, Average, and High, the number of the degrees of freedom thus being v=2.

V. RESULTS

In Tables 4–7, the results are presented using both absolute values (number of students) and relative values (percentages) to ensure clarity and comparability between the control and experimental groups, which differed slightly in size. Percentages were calculated within each group. The χ^2 values reported in the tables correspond to Pearson's chi-square test used to assess differences between group distributions across the defined SPC levels. The results of testing the cognitive component of SPC are provided in Table 4.

Table 4. Results on the level of the cognitive component of SPC in students at the ascertaining stage.

Level	Students, total		CG (N=196)		EG (N=215)		χ^2_{emp}
	N	%	N	%	N	%	
Sufficient	225	54.8	98	50.0	127	59.1	3.551
Average	146	35.5	78	39.8	68	31.6	
High	40	9.7	20	10.2	20	9.3	
Total	411	100.0	196	100.0	215	100.0	

[1] Percentages are calculated within groups. χ^2_{emp} refers to Pearson's chi-square test for the overall group comparison at $\alpha = 0.05$.

Analyzing the data given in Table 4, we found that most of the students were at a sufficient level (225 respondents – 54.8%), which we consider adaptationally-reproductive as applied to the cognitive criterion. Furthermore, the indicators in the CG and EG were virtually at the same level, which suggests that students developed a proper understanding of inclusive school education for children with SEN. However, this knowledge was superficial and stayed at the level of popular science sources discussing the consequences and prospects of introducing inclusive education. A total of 146 students (CG – 78, EG – 68), which makes up 35.5% (CG – 39.8%, EG – 31.6%) had an average level of the cognitive component, meaning that they were informed about the introduction of inclusive education and its consequences and prospects, but had no knowledge about the inclusive environment

or the methods and forms of work with children with SEN. Finally, only 9.7% of our research participants (40 students) displayed a high level of cognitive knowledge, pointing to the need to simultaneously ensure appropriate social conditions in an inclusive school environment, professional preparation of teachers for work in an inclusive environment, and developing their relevant competence of polyfunctional work in such an environment.

Because $\chi2emp \approx 3.551 < \chi20.05 \approx 5.991$, the H0 hypothesis that the empirical distribution has no difference is accepted at the significance level of $\alpha=0.05$. From this, we drew the following conclusion: with a 95% reliability, there are no grounds to consider the empirical distributions of the levels of the cognitive SPC component in the CG and EG identical. This finding indicates that before the formative stage of the experiment, students in the CG and EG had the same starting opportunities, i.e., had the same level of the studied parameter. Using the diagnostic method for the motivational sphere, we identified important qualities in CG and EG students associated with the development of their ability to work in an inclusive school environment. Specifically, these include a focus on mastering professional knowledge for future professional practice and an interest in working in an inclusive environment (Table 5).

Table 5. Summarized parameters of the motivational sphere of EG and CG students before the experiment.

Level	Knowledge acquisition		Mastery of the profession	
	N	%	N	%
CG (N=196)				
Sufficient	39	19.9	137	69.9
Average	105	53.6	33	16.8
High	52	26.5	26	13.3
EG (N=215)				
Sufficient	46	21.4	129	60.0
Average	106	49.3	51	23.7
High	63	29.3	35	16.3
$\chi2emp$	0.757		4.557	
$\chi2$ 0.05	5.991		5.991	

[1] Percentages are calculated within groups. χ^2emp values represent Pearson's chi-square test results for group comparisons at $\alpha = 0.05$.

The results presented in Table 5 indicate that students had not yet developed motivation for the acquisition of knowledge, which is evidenced by the following indicators. A striving for a high level of knowledge was demonstrated by only 26.5% in the CG (in the EG – 29.3%). A sufficient level of knowledge was found in 19.9% in the CG and 21.4% in the EG, which is not enough to work in an inclusive school environment. Finally, only half of the students showed an average level of motivation for mastering knowledge in the process of vocational training (CG – 53.3%, EG – 49.3%). Nevertheless, most of the students had a sufficient level of motivation for mastering the profession: 69.9% in the CG and 60% in the EG. However, a high level of striving to obtain the profession was found only in 13.3% in the CG and 16.3% in the EG. Statistical assessment of the reliability of the lack of difference between empirical distributions (Table 5) in the CG and EG was performed with Pearson's $\chi2$ test.

The empirical values of $\chi2emp$ for the two motivational indicators ("Knowledge acquisition" and "Mastery of the profession") amounted to 0.757 and 4.557, respectively. The critical value of $\chi2$ for the significance level of $\alpha=0.05$ for the three indicators of motivation was $\chi20.05 \approx 5.991$. Since all empirical values were less than the critical, the null hypotheses H0 that there is no difference between the empirical distributions of the two indicators was accepted at the significance level of $\alpha=0.05$.

Table 6. Summarized parameters of the emotional sphere of EG and CG students before the experiment.

Level	Empathy		Benevolence	
	N	%	N	%
CG (N=196)				
Sufficient	71	36.2%	76	38.8%
Average	90	45.9%	87	44.4%
High	35	17.9%	33	16.8%

EG (N=215)				
Sufficient	91	42.3%	97	45.1%
Average	70	32.6%	68	31.6%
High	54	25.1%	50	23.3%
$\chi 2$emp	3.873		4.218	
$\chi 2$ 0.05	5.991		5.991	

[1] Percentages are calculated within groups. χ^2emp values represent Pearson's chi-square test results at $\alpha = 0.05$.

The reliability of the lack of difference between the EG and CG by empirical distribution (Table 6) was tested using Pearson's $\chi 2$ test. The empirical value of the criterion $\chi 2$emp for the two indicators of the emotional sphere (empathy and benevolence) was 3.873 and 4.218, respectively. The critical value of $\chi 2$ for the level of significance α=0.05 for the three emotional sphere indicators amounted to $\chi 2 0.05 \approx 5.991$. Since all empirical values were lower than the critical, the null hypothesis H0 about the lack of differences between the empirical distributions of the two indicators was accepted at the significance level of α=0.05. As can be seen from Table 7, the control test of the development of SPC in future primary school teachers for work in an inclusive school environment after the formative stage of the experiment confirmed an increase in students' level of competence.

Table 7. Levels and dynamics of development of SPC components in future elementary school teachers for work in an inclusive school environment after the experiment (%, N).

Level	Cognitive, %			Personal and professional								
				Motivational, %			Emotional, %					
	CG	EG	Δ	CG	EG	Δ	Empathy			Benevolence		
							CG	EG	Δ	CG	EG	Δ
	%	%	%	%	%	%	%	%	%	%	%	%
Sufficient	49.5	33.5	-16	4.5	1.9	-2.6	35.2	33.4	-1.8	38.2	36.2	-2
Average	39.8	41.8	2	18.4	16.3	-2.1	46.4	38.2	-8.2	43.9	34	-9.9
High	10.7	24.7	14	77.1	81.8	4.7	18.4	28.4	10	17.9	29.8	11.9
Total	100	100	0	100	100	0	100	100	0	100	100	0

Level	Cognitive, %			Personal and professional								
				Motivational, %			Emotional, %					
	CG	EG	Δ	CG	EG	Δ	Empathy			Benevolence		
							CG	EG	Δ	CG	EG	Δ
	n	n	n	n	n	n	n	n	n	n	n	n
Sufficient	97	72	-25	9	4	-5	69	72	3	75	78	3
Average	78	90	12	36	35	-1	91	82	-9	86	73	-13
High	21	53	32	151	176	25	36	61	25	35	64	29
Total	196	215	19	196	215	19	196	215	19	196	215	19
$\chi 2$emp	17.552			6.036			6.110			8.757		
$\chi 2$ 0.05	5.991			5.991			5.991			5.991		

[1] Percentages are calculated within groups; Δ indicates EG − CG. χ^2emp values represent Pearson's chi-square test results at $\alpha = 0.05$.

VI. DISCUSSION

Our results show that after the conducted experiment, the number of EG students with a high level of SPC in professional activity significantly increased (by the cognitive component +14.0%, by the motivational +4.7%, by the emotional: empathy +10.03%, benevolence +11.9%), while EG students at a sufficient level became fewer (by the cognitive component -16.0%, by the motivational -2.6%, by the emotional: empathy -1.8%, benevolence -2.0%). Comparable effects have been reported in previous studies devoted to the professional training of teachers for inclusive education, where targeted pedagogical interventions were associated with positive shifts in cognitive, motivational, and emotional aspects of professional competence [27-29]. These studies emphasize that structured inclusion of inclusive pedagogy within teacher education programs contributes to changes in students' readiness for inclusive practice, particularly in motivational orientation and emotional responsiveness.

At the same time, earlier research often relies on descriptive comparisons or isolated indicators, whereas the present study applies a unified quantitative approach to assess the dynamics of SPC components. This makes it possible not only to observe positive changes but also to statistically verify differences between the experimental and control groups across all studied parameters. The reliability of experimental findings and respective statistical conclusions was verified by the same procedure of testing statistical hypotheses using Pearson's χ2 test. The empirical and theoretical values of χ2 at the significance level of 0.05, which are provided in the last rows of Table 7, indicate the significance of differences between the distributions of the EG and CG by all studied parameters. Now, we shall proceed to interpret individual indicators concerning the pedagogical competence of future inclusive primary school teachers after the implementation of our experimental method and at the end of the experiment.

As demonstrated by data in Table 7, after the formative experiment, the number of students at a sufficient level of the cognitive component of SPC, which suggests readiness to work as a primary school teacher but is not enough for work in an inclusive environment, became significantly lower in the EG (Δ=-25 people). This change is attributed to respondents' transition from the sufficient level to higher levels. In contrast, the CG showed no significant changes.

The dynamics of the motivational component further indicate that under the influence of specially organized training, the number of EG students at a sufficient level significantly reduced due to their transition to other levels, while no such change was observed in the CG. Before the experiment, the CG had 18.9% at an average level of the motivational component, and at the end, this indicator amounted to 18.4% (Δ=-0.5), i.e., had no substantial change. The EG, on the other hand, showed a change in this proportion, the dynamic amounting to Δ=-5.6. Importantly, we achieved a shift in the motivational component in the EG – an increase of Δ=+7.9. The observed changes in the motivational component are consistent with findings of previous studies, which emphasize the close relationship between professional motivation and the development of emotionally significant qualities in future teachers working in inclusive settings [30, 31]. Research on inclusive teacher education suggests that increased motivation to engage in professional activity often serves as a prerequisite for deeper personal involvement in pedagogical interaction, including the development of empathy and benevolence. In this context, the positive dynamics observed in the motivational sphere of the experimental group may be considered as a factor facilitating subsequent changes in the emotional component of social and pedagogical competence [32, 33].

In the course of the formative experiment, students also learned to better regulate their psychological features and coordinate them with their chosen profession. The level of empathy in EG students was also found to be significantly different after the formative experiment.

A high level of empathy was much more prevalent in the EG compared to the CG (28.4 and 18.4%, respectively). Considerable differences between the two groups were also found with respect to a sufficient level, demonstrated by 38.2% of EG students and 46.4% of CG students. This result testifies to the efficiency of vocational training of primary school teachers, and thus the fact that they gained the skills of empathy and compassion, accepting special needs children as they are. In an inclusive school environment, these specialists will be attentive in communication, try to understand more than words can tell, avoid conflict situations, and be sensitive to the problems of different children in the student body. Similar patterns have been described in earlier studies focusing on the emotional dimension of teachers' readiness for inclusive education. Previous research highlights empathy as a key emotional prerequisite for effective interaction with children with special educational needs and notes that its development is closely linked to purposeful pedagogical training and reflective practice [34, 35]. At the same time, empathy is rarely considered in isolation and is often examined in conjunction with other prosocial qualities that shape teachers' emotional attitudes toward students. From this perspective, the observed changes in empathy in the experimental group create a conceptual basis for analyzing related emotional characteristics, such as benevolence, within the structure of social and pedagogical competence.

Apart from empathy, the emotional aspect of the personal and professional component of the SPC of future primary school teachers includes benevolence as a personally important quality [36]. After the conducted experiment, we observed positive changes with a significant lead of the EG. In particular, the prevalence of a high level was 11.9% greater than in the CG.

The development of the emotional component is a subtle process, even under specially organized training. These qualities are genetically predetermined and depend on the person's emotional potential, personality traits (temperament, character, sensitivity), upbringing, life conditions, and values. Therefore, they are practically impossible to mold, although some correction can be achieved. Emotionality manifesting through compassion, empathy, complicity, and assistance is connected with the development of such a humanistic trait as benevolence, which serves as a mechanism of communication in the emotional process laid down in "subject-subject" relationships in an inclusive school environment [37, 38]. The soulfulness, trust, responsibility, and pedagogical tact that define benevolence ensure comfortable communication in an inclusive environment.

Our findings indicate that the organization of vocational training for primary school teachers to work in an inclusive environment requires analyzing the content and modern approaches to the application of methods and techniques of training students. We conclude that the pedagogical process at universities needs to be built in a way for students to master interactive and specialized methods of teaching in primary school and develop the necessary personally and professionally important qualities and competencies required of a primary school teacher who not only has the knowledge of inclusive education, but possesses the pedagogical knowledge demanded by inclusive education.

We conclude that the vocational training of primary school teachers for work in an inclusive school environment is complicated by several problems. First, the content of the university pedagogical process needs to be approximated to reality as much as possible. We agree with Osiesi [39], believing that the training of primary school teachers for work in an inclusive environment should be professionally oriented and that the content of each discipline has to focus the student on future professional practice and prepare them to perform professional functions. Second, we argue that the preparation of future primary school teachers for work with children at different levels of psychophysical development needs to be grounded in the science of the art of raising SEN children in the same environment as healthy children – the science of inclusive pedagogy. Thus, inclusive pedagogy should be a core academic discipline in the vocational training of primary school teachers for work in an inclusive school environment.

VII. CONCLUSION

The introduction of inclusive education dictates the need for highly competent specialists to work in an inclusive environment and for the vocational training of teachers for general education institutions. A special urgency in the vocational training of future primary school teachers is gained by the task of developing their SPC for work in an inclusive school environment. The conducted experiment confirmed that as a result of the implemented vocational training and the special method to develop future primary school teachers' SPC to work in an inclusive environment of a general education institution, at the final stage, a positive dynamic was achieved in each SPC component. Despite the positive results obtained, the present study has several limitations that should be considered when interpreting the findings. First, part of the data was collected using self-reported diagnostic instruments, which may be influenced by social desirability and subjective self-assessment of participants. Second, the study was conducted within a single higher education institution, which may limit the generalizability of the results to other institutional and cultural contexts.

Future research could extend the present findings by involving multiple higher education institutions, which would allow for a broader comparison of training contexts and reduce the influence of institutional specificity. Nevertheless, the findings of the present study open several directions for further research. One promising avenue is longitudinal tracking of graduates to examine the stability of social and pedagogical competence over time and its manifestation in real professional practice. Another important step would be to replicate the proposed pedagogical model with practicing primary school teachers to assess its effectiveness beyond the university training context.

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Author Contributions

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data are available from the authors upon request.

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REFERENCES

1. Ramazanova, D., Togaibayeva, A., Yessengulova, M., & Yertleuova, B. (**2025**). Assessment of stress level in students with special educational needs during distance learning. *Cogent Education, 12*(1), Article 2579736.

2. Abdullayev, I., Kupriyanova, A., Stepanova, D., Rybakov, A., Galkin, A., & Malchukova, N. (**2024**). Reducing social inequality and improving access to education: Features of international legal regulation. *Revista Jurídica, 3*(79), 622–637.

3. Kulbayeva, A. (**2025**). Transformation of the professional and personal competencies of teachers and overcoming ethical problems in the introduction of artificial intelligence in education. *Perspektivy Nauki i Obrazovania = Perspectives of Science and Education*, (6), 683–699.

4. Smagulov, M., Yesdaulet, Y., & Adilova, S. (**2025**). Developing future specialists' competencies through a digital reflective learning model at the university. *Journal of Advanced Pharmacy Education and Research, 15*(4), 142–148.

5. Tolegen, M. A., Seriev, B. A., Akhatov, U. A., Taubayev, B. R., & Balashov, T. T. (**2016**). Social and legal aspects of the educational support of adolescents with deviant behavior. *International Journal of Environmental and Science Education, 11*(11), 4768–4780.

6. Artemeva, T. V., Akhmetzianova, A. I., & Kurbanova, A. T. (**2015**). *Inkliuzivnaia praktika v vysshei shkole: Uchebno-metodicheskoye posobiye [Inclusive practice in higher education: Educational and methodological manual].* Kazan University Publishing House.

7. Birot-Gautron, K., Kohout-Diaz, M., & Deyrich, M. C. (**2025**). Inclusive professional practices of primary school teachers in multigrade classes in France catering for pupils with special educational needs. *International Journal of Educational Research, 131*, Article 102598.

8. Fitas, R. (**2025**). Inclusive education with AI: Supporting special needs and tackling language barriers. *AI Ethics, 5*, 5729–5757.

9. Gal, C., & Ryder, C. H. (**2025**). Unlocking potential: Comparing collaborative and traditional learning methods for students with learning disabilities in special education classrooms. *Social Sciences & Humanities Open, 11*, Article 101521.

10. Turanin, V., & Posokhova, Y. (**2023**). Digital transformation's impact on society and the right to education. *Interacción y Perspectiva, 14*(1), 211–220.

11. Golubeva, T., Korotaeva, I., Rabadanova, R., & Kovaleva, O. (**2023**). Implementing the right to receive education in the context of distance learning technologies. *Revista Relações Internacionais do Mundo Atual, 6*(39).

12. Zabeli, N., & Gjelaj, M. (**2020**). Preschool teacher's awareness, attitudes and challenges towards inclusive early childhood education: A qualitative study. *Cogent Education, 7*(1), Article 1791560.

13. Iarskaia-Smirnova, E., Bolshakov, N., & Walker, C. (**2025**). Inclusive education in Eastern Europe and the South Caucasus: Comparing parental satisfaction. *Children and Youth Services Review, 169*, Article 108087.

14. Markitanova, R. M. (**2017**). Realizatsiia inkliuzivnogo obrazovaniia v sovershenstvovanii uzhe poluchivshikh aprobatsiiu variativnykh sistem v strukture otechestvennogo obrazovaniia [Implementation of inclusive education in improving already tested variative systems in the structure of domestic education]. *Correctional Pedagogics*, (1), 15–27.

15. Aslaeva, R. G., Saitkhanov, A. F., & Saitkhanova, V. Ia. (**2016**). Aktualnye voprosy primeneniia innovatsionnykh tekhnologii v sfere spetsialnogo i inkliuzivnogo obrazovaniia [Topical issues in the application of innovative technologies in special and inclusive education]. *Correctional Pedagogics, 4*(70), 13–20.

16. Sareen, S., & Mandal, S. (**2024**). Challenges of blended learning in higher education across Global North–South: A systematic and integrative literature review. *Social Sciences & Humanities Open, 10*, Article 101011.

17. Opoku, M. P., Elhoweris, H., Alhosani, N., Mustafa, A., Alkhateri, T., & Nketsia, W. (**2023**). Factors influencing the intention of trainee special education teachers to integrate assistive technology into teaching students with disabilities in the United Arab Emirates. *Heliyon, 9*(12), Article e22736.

18. Buerkle, A., O'Dell, A., Matharu, H., Buerkle, L., & Ferreira, P. (**2023**). Recommendations to align higher education teaching with the UN sustainability goals – A scoping survey. *International Journal of Educational Research Open, 5,* Article 100280.

19. Hendriksen, N., Logtenberg, A., Westbroek, H., & Janssen, F. (**2024**). Exploring teachers' agency in inclusive education: Secondary education teachers navigating their projects in responding to diversity in students' sociocultural backgrounds. *Teaching and Teacher Education, 149*, Article 104731.

20. Sahli Lozano, C., Wüthrich, S., Büchi, J. S., & Sharma, U. (**2022**). The concerns about inclusive education scale: Dimensionality, factor structure, and development of a short-form version (CIES-SF). *International Journal of Educational Research, 111*, Article 101913.

21. Juhairiah, S., Yuwono, D. T., & Sabela, W. (**2024**). The role of vocational schools in enhancing teacher competence for inclusive education of special needs children in Central Kalimantan. *Tunas: Jurnal Pendidikan Guru Sekolah Dasar, 9*(2), 162–166.

22. Ketrish, E. V. (**2018**). *Gotovnost pedagoga k rabote v usloviiakh inkliuzivnogo obrazovaniia: Monografiia [Teacher's readiness to work in the conditions of inclusive education: Monograph].* Russian State Vocational Pedagogical University Publishing House.

23. Gheyssens, E., Consuegra, E., Engels, N., & Struyven, K. (**2021**). Creating inclusive classrooms in primary and secondary schools: From noticing to differentiated practices. *Teaching and Teacher Education, 100*, Article 103210.

24. Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J. M., Morisseau, T., Bourgeois-Bougrine, S., … Lubart, T. (**2023**). Creativity, critical thinking, communication, and collaboration: Assessment, certification, and promotion of 21st century skills for the future of work and education. *Journal of Intelligence, 11*(3), Article 54.

25. Leal, S., Nascimento, J., Piki, A., Tekerek, A., Güzel, A., Loureiro, A., … Teunen, L. (**2024**). Exploring sustainable development perceptions among higher education students: An empirical study on knowledge, attitudes, and behaviours. *Cleaner and Responsible Consumption, 14*, Article 100182.

26. Ilyin, T. I. (**2000**). *Motivation of learning in higher education.* IMATON.

27. Li, X., Cheng, S., Chen, N., & Wang, H. (**2025**). The promoting role of teachers' emotional competence in innovative teaching behaviors: The mediating effects of teaching efficacy and work vitality. *Behavioral Sciences, 15*(10), Article 1357.

28. Mergia, A. T. (**2025**). Preparing special needs educators for mainstream school practice in Ethiopia: A study of the special needs and inclusive education professional preparation program. *SAGE Open, 15*(4).

29. Fajardo, R. A., Goce, E. C., Balbutin, R. R., Matondo, F. L., Lozano, J. A., Sabunod, G. M. M., Sarangani, A. F. M., & Yamba, R. B. (**2025**). The realities of inclusive teaching: Insights from seasoned teachers. *Journal of Research in Special Educational Needs, 52*(4), 646–658.

30. Kovalchuk, V., Prylepa, I., Chubrei, O., Marynchenko, I., Opanasenko, V., & Marynchenko, Y. (**2022**). Development of emotional intelligence of future teachers of professional training. *International Journal of Early Childhood Special Education, 14*(1), 39–51.

31. Llorent, V. J., Núñez-Flores, M., & Kaakinen, M. (**2024**). Inclusive education by teachers to the development of the social and emotional competencies of their students in secondary education. *Learning and Instruction, 91*, Article 101892.

32. Xu, F., Wang, L., & Xu, J. (**2025**). The impact of teachers' motivating style and student–teacher relationships on adolescents' class participation: The indirect role of learning motivation. *Acta Psychologica, 257*, Article 105105.

33. Dahri, N. A., Yahaya, N., Al-Rahmi, W. M., Noman, H. A., Alblehai, F., Kamin, Y. B., Soomro, R. B., Shutaleva, A., & Al-Adwan, A. S. (**2024**). Investigating the motivating factors that influence the adoption of blended learning for teachers' professional development. *Heliyon, 10*(15), Article e34900.

34. Ko, E. J., Seo, E. J., Lee, Y., Ha, J., Kim, S., & Park, J. H. (**2025**). The impact of an empathy education programme on empathy, communication skills and emotional competency in nursing students: A quasi-experimental study. *Nurse Education in Practice, 85*, Article 104364.

35. Pan, C. H., Liu, M. J., Ma, L. Y., & Chen, H. C. (**2025**). Presence and empathy as mediators between immersion and prosocial intentions in primary school children. *Computers in Human Behavior, 172*, Article 108765.

36. Tai, J., Raghunathan, K., Dollinger, M., & McKenna, L. (**2024**). Are inherent requirements a barrier to diversity? An analysis of course entry information. *Collegian, 31*(4), 252–257.

37. Davletova, A., Nazarova, A., Alzhanova, A., & Lazareva, Y. (**2025**). How does student creativity depend on teaching methods at the institute? Modern information technologies for education and creativity as manifestations of the specifics of the psyche. *Cogent Education, 12*(1), Article 2482502.

38. Aryani, W. D., Dermawan, O., Kayadibi, S., & Sain, Z. H. (**2025**). Inclusive education management: A systematic review of practices, challenges, and solutions in educational institutions. *Nidhomul Haq: Jurnal Manajemen Pendidikan Islam, 10*(3), 853–866.

39. Osiesi, M. P., Ayanwale, M. A., Akomolafe, O. D., Olayiwola-Adedoja, T. O., Olatunbosun, S. O., & Ariyo, S. O. (**2024**). Transforming classrooms: How professional development and teacher attitudes drive primary school teaching effectiveness. *Social Sciences & Humanities Open, 10*, Article 101099.