Developing Teachers' Inclusive Competence by Means of ICT in Postgraduate Education

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Abstract: The traditional organization of increasing the teachers' level of inclusive competence in the system of postgraduate education in the framework of stationary courses is not effective enough. One of the reasons for this is lack of access to a large amount of the latest information that is available in modern research. Rapid changes in information technologies development open up more opportunities for modern teacher to acquire the necessary professional knowledge for teaching children with special educational needs. The article proposes an improved organization for increasing the level of inclusive competence in the postgraduate education, in which, along with traditional training in the framework of stationary courses, teachers, using ICT, participate in online courses and webinars posted on various educational platforms in the Internet. The characteristics of educational platforms ed-era.com, futurelearn.com, elt.oup.com, coursera.org, vseosvita.ua were analyzed. Pedagogical experiment was carried out, in which 2 groups of English teachers participated. In the control group, professional development was carried out traditionally, and in the experimental group – within the framework of improved organization of training. The analysis of the results showed that in the experimental group the greater level of inclusive competence was achieved in comparison with the control group. It was proved that this result was achieved thanks to improved organization of training using ICT tools. The results of the pedagogical experiment indicate the advantage of proposed organization for teachers' inclusive competence development in comparison with the existing one. In connection with the above, the work, in our opinion, is of international importance.

Keywords: *teacher's inclusive competence; informational and communicational technologies; online course; webinar; postgraduate education.*

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1. Introduction

At the present stage of innovative development of education in Ukraine, the state outlines qualitatively new requirements for the teacher's personality, his professional activity. Among such requirements, a special place is occupied by the teacher's implementation of the basic principles of state policy in the field of national education, namely: the priority of education, its democratization, humanization and humanitarization, equal access to education, integrity, multiculturalism, changeable and open nature of education, indivisible training and education. This requires a high level of education, culture, qualifications of teachers, whose professional activity is the basis for the transformation of Ukrainian society at both individual and social levels.

The implementation of these principles is fully facilitated by the implementation of the basic principles and ideas of inclusive education in general secondary education. Inclusive education has now become a global trend, which to some extent reflects the civilization level of society in a country. Increasing the number of children with psychophysical developmental disorders is a problem not only on the Ukrainian but also on a global scale.

Obtaining a high-quality general secondary education by such children is one of the main and inalienable conditions for their successful socialization, ensuring full participation in the life of society, self-realization in various types of professional and social activities. Often, due to psychological barriers and professional stereotypes, the problem of teachers' unwillingness to work with children with special educational needs arises. Until recently, there was no topic «Inclusive education» in the curricula of institutions of postgraduate education, so there is a gap between the previously received and currently required professional training. In this regard, the development of teachers' inclusive competence as a component of their professional competence becomes important.

A significant role in creating conditions for teachers' inclusive competence development is played by institutions of postgraduate pedagogical education, which provide advanced training.

Teachers' proficiency in ICT methods allows them to additionally acquire a significant amount of knowledge in correspondence and distance learning.

Online courses provide teachers with the opportunity to watch instructional videos, get additional information on various aspects,

participate in discussions on various issues in chat mode, complete creative and test assignments, and more.

The purpose of the article is to propose an improved organization of training in the system of postgraduate education, in which, along with traditional methods in the framework of stationary courses, participation in online courses and webinars posted on various educational platforms is provided, which helps to equip professionals with modern knowledge necessary for teaching children with special educational needs.

The analysis of scientific and pedagogical literature shows an insufficient elaboration of the issue of using ICT for the teachers' inclusive competence development in the system of postgraduate education.

Existing educational platforms have different interface structures. We have chosen to use the most famous and friendly Ukrainian and English-language educational platforms, such as: ed-era.com, vseosvita.ua, futurelearn.com, coursera.org.

The research hypothesis is that the proposed improved organization of training in the postgraduate education system is more effective than the existing one due to the teachers' participation in the use of ICT in online courses and webinars posted on various educational platforms on the Internet.

2. The General Context of the Study

2.1. Literature Review

Since the worldwide paradigm transformation from exclusive to inclusive education, the roles and responsibilities of secondary education teachers have felt under a radical change (Agbenyega & Deku, 2011; Alhassan, 2012; Hornby, 2010; Naicker, 2009). Teachers are required to contemporaneously meet the demands of children with typical development and their peers with special needs in regular classrooms (Allday et al., 2013; Berry, 2010; Forlin & Sin, 2010; Kim & Rouse, 2011). Therefore, inclusive education requires a unique set of competencies from teachers, which was traditionally absent in their arsenal (Blanton et al., 2011; Chireshe, 2013; Oliver & Reschly, 2010). Several researchers (e.g., Agbenyega & Deku, 2011; Florian & Spratt, 2013; Forlin & Sin, 2010; Vaughn & Bos, 2012) that are involved in teaching children with special needs (e.g., The Council for Exceptional Children [CEC]) expresses some key competencies that are necessary for effective tuition of children with special needs to profit from their learning in regular classrooms. Competencies like this include the awareness of teaching strategies and approaches that meet the needs of all

kids in regular classrooms (Forlin & Sin, 2010; Hornby, 2010). These proficiencies allow teachers to plan supple regulations and to recognize the reality of distinctions between and in children, whereas still being capable to simplify teaching and learning goals, content, and the environment to the needs of personalities and the class in general.

Consecutive with this background of pedagogical competencies, a common kernel of minimum basic proficiency for entry into professional practice was worked out and maintained by the CEC. These norms, which the CEC transfigured in 2012, include student growth, progress, elaboration and separate learning diversities, educational environments, curricular content knowledge, evaluation, instructional planning and techniques, professional learning and practice, and partnership. Regular school teachers need a specific level of proficiency in the mastery in the CEC general core, whereas these skills may not be necessary for them. The same way, other researchers find out that significant skills for teachers in inclusive classrooms consist of peer tutoring, integrated learning, curricular transformation, mastery learning and applied behavior Analysis, the use of classroom support, instructional technology, and assistance for children with the help of other kids (Mastropieri & Scruggs, 2010; Oliver & Reschly, 2010; Philpott et al., 2010). Studies also indicate that regular teachers have to apply instructional strategies, such as individualized and adaptive education and activity-based learning, to promote teaching and learning of children with disabilities (Apelgren & Giertz, 2010; Friend & Bursuck, 2012; Majoko, 2005).

Other researchers point out that teacher needs competencies in vocational knowledge, assessment, instructional techniques, and behaviour control to involve children with special educational needs in regular classrooms (He & Cooper, 2011; Majoko, 2017). Moreover, teachers require skills in instructional procedures, such as differentiated instruction, multilevel instruction, collaborative skills, co teaching, and activity-based learning, to include children with special needs in regular classrooms (Apelgren & Giertz, 2010). Strategies such as cooperative learning and peer tutoring have been retrieved to result in refined child outcomes. For example, peer tutoring has been created to enhance potential to react, magnify activity understanding and lessen behaviour problems (Marchand-Martella & Martella, 2002), and accomplish child on-task behaviour, mathematics, reading capacity, and social cooperation of children with special needs in regular classrooms (Fuchs et al., 2000). Cooperative learning strategies have been created to enhance intergroup communication, strengthen learning, form problem-solving skills, and improve social and

educational skills of students with disabilities in regular classrooms (Jenkins et al., 2003). With respect to refinement of communicative skills because of taking part in cooperative learning, the study indicated enlarged periodicity, continuance, and property of social interactions among children with special educational needs (Friend & Bursuck, 2012; Jenkins et al., 2003).

Partnership is also a fundamental competency for teachers in inclusive education (Forlin & Sin, 2010; Mastropieri & Scruggs, 2010; Naicker, 2009). Teachers need, among other abilities, competence in contribution that can put to their problem-solving and creative thinking as they share thoughts with peers, because children with disabilities need a variety of teaching approaches (Berry, 2010; Donnelly & Watkins, 2011; Flecha & Soler, 2013). Other authors point out that teaching and learning need helpful, valid, valuable, suitable teaching strategies that digress from the individualized planning pattern, which is associated with particular special education teaching, to an direction that accommodates goals and content for learning, as well as educational environment, through an responsibility for the whole class and by contemporaneously accepting diversities of and in children (Ainscow & Goldrick, 2012; Allday et al., 2013; Black-Hawkins & Florian, 2012; Pantic, 2015).

Training the new sort of a teacher, able to realize inclusive education is particularly relevant and inviting for higher pedagogical school. It is a content-ideological, moral and spiritual training of professionals in the humanities, the ability to independently and creatively, it is advisable to choose and use technologies which are appropriate for use with specific educational groups, whether children with physical and intellectual disabilities, children from different social groups living in the city or village. Despite the fact that the teachers' readiness to realize inclusive education is viewed in psychological and pedagogical study as a main, basic, crucial success factor in the formation an inclusive process, now in science there is no unified approach to the determination of the mentioned concepts. Topicality of a extensive study of teachers' readiness of to work in inclusive conditions, in conditions of diversity, is determined by the demands of social development and the significance of the teacher's role in the inclusion of kids with special needs in the development of educational activities. In exterior researches, teachers' willingness to work with children with disabilities is mostly studied to recognize the teachers' attitudes towards inclusive education and the degree of its reaction on the social cooperation of children with special needs in the secondary education institutions (De Boer et al., 2011). These issues in total demonstrate a negative attitude of secondary school teachers for inclusive education, the presence of which, in

large part, due to the lack of knowledge about the personal characteristics of teachers of children with special educational needs and the lack of specific skills for their teaching.

The social order of society to make teachers ready to work in inclusive conditions, the need to involve children with disabilities into the development of a comprehensive school environment and the lack of qualified teachers for inclusive education led to the emergence of large number of scientific studies on the identification of the impact of programs of training of teachers in higher education institutions their willingness to implement inclusive education (Forlin, 2001; Chambers, 2015; Pijl, 2010; Florian, 2012; Florian & Linklater, 2010; Zalizan, 2010 and others). Much of today's research focuses on the identification of the list of competencies and skills that are essential to future teachers to work with children with disabilities development. In this case, the basic qualities of the teacher working with children with disabilities, found empathy (O'Corman & Drudy, 2010, etc.), teaching optimism, humanity (Hoffman, 2011), love for children, patience (Agavelyan et al., 2020 and others), the activity of the teacher, in collaboration with a child with disabilities development (Agavelyan et al., 2020; Shestoperov & Sergeeva, 2016) and others in the research stated the need to create a culture of spiritual teachers and professional personal readiness (Movkebaieva et al., 2013, pp. 549–550).

Finding the teacher as one of the most important facilitators of organization the inclusive education process, he has an obligation to create a special and effective environment for learning. In dealing with professional demands on creating a scope for SEN students' education, teaching, upbringing and development, the educator has to master specific professional and personal competences. Personal competences could be shown through the attitudes and wish for teaching SEN students in general secondary institutions and professional competencies through the SEN student characteristic knowledge, accepting abilities for and techniques of learning (Bukvić, 2014).

The analysis of previously mentioned research in this area shows that teacher's inclusive competence must be developed in the postgraduate education system, and there are different ways to do this in the traditional educational process. At the same time, ICT is a powerful tool for accelerating progress in all spheres of social development, one of the most important factors determining the competitiveness of a society, used both in teaching and in teaching management, which was not clearly mentioned in the analyzed studies.

Improving the teachers' computer literacy and their mastering of information and web technologies is the fulfillment of a social order for the implementation of the state strategy for the information society development.

2.2. Online courses' and Webinars' description

We emphasize the need to use ICT tools during postgraduate professional development to participate in online courses and webinars available on the Internet on various educational platforms.

The selected content of online courses and webinars is presented in table 1.

Table 1 – List of online courses and webinars that promote teachers' inclusive competence development

Educational platform	Online courses and webinars
https://www.ed-era.com/courses/	Online courses: «Primary school teacher's work with children with special educational needs», «Non-discrimination approach in education», «Parents' taking part in organization of inclusive education», «Early childhood studies», «Online course for primary school teachers»
https://vseosvita.ua/webinar	Webinars: «Art-therapy in pedagogical practice. Diagnostic techniques», «Effectiveness of associative symbols method at the primary stage of learning English», «Peculiarities of learning English in the 1st grade by associative symbols method», «Who are they: children with special educational needs?», «Students' failure. Why is it difficult to learn for them?», «Blended learning is a key for changes», «Social inclusion in New Ukrainian school» and others
https://elt.oup.com/	Online courses: «Teaching learners with dyslexia», «Teaching learners with SEN» and others
https://www.futurelearn.com	Online courses: «Education for All: Disability, Diversity and Inclusion», «Dyslexia and Foreign Language Teaching», «Understanding Autism», «Good Practice in Autism Education», «Inclusive learning and teaching environment», «The right to education», серія

	курсів «Teaching for success», «Child protection for teachers», «Understanding Diversity and Inclusion» and others
https://www.coursera.org/learn/	Online course «Managing ADHD, Autism, Learning Disabilities, and Concussion in School»

(Source: Authors own contribution)

The criteria for teachers to select online courses and webinars were as follows:

1) availability of courses and webinars on various issues of organization and implementation of conceptual ideas and provisions of inclusive education in general secondary education institutions;

2) practical orientation of the content;

3) convenience of interface;

4) the content;

5) the quality of online communication with the participants;

6) financial accessibility.

The characteristic of the content according to chosen criteria is given in table 2.

Table 2 – Technological characteristics of educational platforms, that promote teachers' inclusive competence development

Criteria of evaluation	EdEra – studio of online education, 2018	Webinars for teachers – postgraduate education together with Vseosvita, 2018	Oxford Teachers' Academy Online, 2019	Future Learn. Inclusive Teaching Courses, 2020	Coursera. Build Skills With Online Courses from Top Instititions, 2018
Availability of courses and webinars on various issues of organization and implementati on of conceptual	Limited number of courses	A great amount of courses	Limited number of courses	A great amount of courses	Limited number of courses

ideas and provisions of inclusive education in general secondary education institutions					
Practical orientation of the content	yes	yes	yes	yes	Content has practical orientation, but also includes a lot of theoretical aspects, in spite of the fact they are interesting and important
Convenience of interface	Interface is convenient	Interface is convenient	Interface is convenient	Interface is convenient	Interface is not very convenient
The content	Informatory, actual nowadays	Well-defined	Interesting, informatory	Interesting, original	Saturated
The quality of online communication with the participants	Online communication is provided; participants can see their progress	Online communication is provided	Online communication is provided; participants cannot see their progress	Online communication is provided; participants can see their progress	Online communication is provided, but it is difficult to use it; participants can see their progress
Financial accessibility	Participation and certificate are free	Participation is free, certificate's price is available	Demo version is free, the price of participation is high	Participation is free, certificate's price is high	Participation is free, no certificate

(Source: Authors own contribution)

The role of the tasks and activities in the online courses and webinars is to motivate teachers and to involve them in working in inclusive educational environment.

For example, online course «Education for All: Disability, Diversity and Inclusion» was provided during six weeks, taking into account the following aspects (modules): Why inclusion?, Education begins at home, Creating an inclusive school, Partnerships for success, Changing classroom practices, Building networks.

Each week module includes warming-up section, different types of articles with hyperlinks, video watching, examples from educational practice, quizzes, and discussion sections. Teachers were offered to discuss topics in chats.

3. Research Methodology

3.1. Methods

The work includes theoretical and empirical research methods:

- analysis of scientific and pedagogical literature, the content of online courses on Internet educational platforms to summarize information and determine the theoretical and methodological foundations of the study;

- studying the educational process in the changed and accurately considered conditions;

- pedagogical experiment;

- a causal analysis of the statistical data obtained in the experiment, after which their qualitative interpretation was made.

The experimental results were processed using the methods of mathematical statistics, after which they were qualitatively interpreted.

3.2. Participants

The study involved 2 groups of English language teachers.

The first group, control (group K) consisted of two academic groups of 30 people (60 in total), who underwent postgraduate training in September and October 2018. The second group, experimental (group E), also consisted of two academic groups of 30 people (60 in total) who underwent postgraduate training in March and April 2019.The groups were formed from teachers sent by schools to training courses in a random way.

Both groups were studied under the same conditions: training was carried out according to the same educational program. The number of hours in both groups was the same. Each group included an equal number of participants of approximately the same age (40-45 years old). The

qualifications of all participants (1st category) testified to approximately the same level of their professional competence.

In the first, control, group of teachers of a foreign (English) language (group K), the organization of the educational process took place traditionally, in accordance with the educational program of advanced training courses.

Organization of training for group K included:

- test work before the start of training;

- theoretical part – traditional lectures, in which the listeners were also introduced to the list of literature on inclusive education;

- educational practice (observation in an inclusive classroom) followed by an analysis of the lesson seen;

- seminars for which the listeners, using literary sources and knowledge gained in the process of lectures and practical training, prepared messages on the topics proposed to them;

- questionarrie at the end of postgraduate training.

The organization of training for group E included:

- test work before the start of training;

- theoretical part – lectures, in which the listeners, in addition to standard lectures and familiarization with the list of literature, were introduced to information about educational platforms on the Internet, which have online courses and webinars for teachers. Courses and webinars are delivered by experts in different areas of inclusive learning. Fragments of video and audio recordings from online courses and webinars were demonstrated at the lectures. The trainees were taught the rules for using ICT to obtain information remotely on educational platforms;

- educational practice (observation in an inclusive classroom) with subsequent analysis of the lessons seen;

- seminars, for which the listeners, using literary primary sources, knowledge, and knowledge gained in the process of lectures and practical training, as well as knowledge gained in online courses and webinars, prepared messages on the topics proposed to them;

- questionarrie at the end of postgraduate training.

We analyzed the group E teachers' activity in courses and webinars.

In general, the teachers of English (in group E) were active participants of the courses and webinars.

The teachers chose online courses on the platform (EdEra – studio of online education, 2018) and webinars on the platform (Webinars for teachers – postgraduate education together with Vseosvita, 2018). Most teachers chose the courses «Primary school teachers' work with children

with special educational needs» (EdEra-SmartOsvita: Inc., 2018) (52 people, 86.7%) and «Education for All: Disability, Diversity and Inclusion» (Future Learn 2020), (60 people, 100%). After participating in one of these courses, teachers additionally chose others for themselves: 24 people (40%) chose the course «Parental participation in the organization of inclusive education» (EdEra-SmartOsvita: Par., 2018); 46 people (76.7%) – the course «Non-discriminatory approach to education» (EdEra-Studena: Inc., 2018).

Materials of the online course «Early Childhood Studies», as well as some materials of other courses were demonstrated during lectures, practical and seminar sessions. Among them there were: videos «What is inclusive education», «Myths about inclusion», «Perception of children with special educational needs», «Organization of inclusive educational environment in an educational institution», «Organization of educational process in cooperation with parents», «Work with children and parents of the class», «What is social inclusion and its connection with the field of education», «Adaptation and modification of the curriculum», «Writing an individual programme of development», video lectures about the peculiarities of teaching children of different kinds of special educational needs, bullying prevention, modular control materials and the final exam (course «Primary school teachers' work with children with special educational needs»); modules «Discrimination at school», «Anti-bullying» and relevant video lectures and materials (course «Non-discriminatory approach to learning»); lectures and materials of modules «Practical advice for parents», «Basic aspects of school maturity», «How to prepare a child for school», «Protect the rights of children» (course «Parental participation in the organization of inclusive education»); video lectures «Introduction to space. Introduction of rules», «Adaptation, safety, inclusion in the educational process», «Lesson settings», «Workshop with children», «Workshop for teachers», «Secrets for teachers» (course «Early Childhood Studies»).

Webinars «Art therapy in pedagogical practice. Diagnostic techniques» (Chernysh, 2019), «Who are they: children with special educational needs?» (Chernysh, 2018), «Student failure. Why is it difficult for them to study? » (Chernysh, 2019), «Blended learning is the key to change» (Kostiuk, 2018), «How teacher expectations affect student success» (Rudenko, 2018), «Social inclusion in the New Ukrainian School» (Sotsial'na inklyuziya v Noviy ukrayins'kiy shkoli, 2018) were watched by teachers directly during the event, or these videos were downloaded from youtube.com and viewed at a convenient time for them. In addition, webinar materials were available for download in Word mode. While watching the webinars, teachers commented on what they heard, asked questions to the

speakers, and answered questions in a chat. During the sessions, teachers had the opportunity to discuss what they saw and heard from the standpoint of how the material proposed by the speakers will be used directly in professional activities.

Teachers of English (group E) were offered to watch webinars «Effectiveness of the associative symbols' method at the initial stage of learning English» (Gunko, 2019), «Features of learning English in 1st grade by associative symbols' method» (Zaniuk, 2019) (in Ukrainian). This is due to the implementation of the Concept «New Ukrainian School» and the peculiarities of foreign language teaching in primary school in general and in the 1st grade in particular.

What is for the platform Oxford Teachers' Academy Online (Oxford Teachers' Academy Online, 2019) the lecturers used certain materials from the courses: «Teaching learners with dyslexia» (video «Dyslexia Explained – What is like being dyslexic», «What is Dyslexia – Kelli Sandman-Hurley» informational materials in pdf mode «Teaching learners with dyslexia»), «Teaching learners with SEN»: (video «Engaging students with learning differences», materials for independent learning «Understanding special educational needs» and others), and from the platform Coursera Courses (Coursera. Build Skills With Online Courses from Top Instititions, 2018) – materials of the course «Managing ADHD, Autism, Learning Disabilities, and Concussion in School»: (video lectures and materials in Word: «What is ADHD», «Diagnosing ADHD», «Managing ADHD», «Symptoms and diagnosis», «What is autism», «Autism spectrum disorder», «Managing children with ASD», «The World of Autism PSA – Autism Speaks», «What are learning disorders», «Specific type of learning disorders», «About learning disabilities», «Diagnostic Criteria for Learning Disorders», «What is a concussion», «Symptoms of Concussion», «Management of a Concussion», pdf-posters «headsupconcussion_poster», «headsupconcussion_signs_symptoms_poster»).

What is about the platform Future Learn (Future Learn. Inclusive Teaching Courses, 2020), which contains many online courses on inclusive education, teachers were invited to take part in the most relevant and practical of them: «Education for All: Disability, Diversity and Inclusion», «Dyslexia and Foreign Language Teaching», «Understanding Autism», «Good Practice in Autism Education», «Inclusive learning and teaching environment», «The right to education», course serias «Teaching for success», «Child protection for teachers», «Understanding Diversity and Inclusion» and others. The teachers chose the course serias «Teaching for success» (60 people, 100%), «Dyslexia and Foreign Language Teaching» (42

people, 70 %) and «Education for All: Disability, Diversity and Inclusion» (38 people, 63,3%).

During lectures, practical and seminar sessions certain educational videos and materials: «Education for All: Disability, Diversity and Inclusion», namely: «Different approaches to education», «Different approaches to education», «Including Children with Disabilities», «A social or individual problem», «The family environment», «Creating an inclusive school», «Can any school be inclusive», «Thinking about what an inclusive school is», «Changing classroom practice», «Differentiated Strategies for Assessment», «Practical tips for teachers», «Curriculum differentiation», «Supporting each other» and others were used and discussed.

We should note that teachers of E group could participate in several online courses simultaneously and perform the proposed tasks at a convenient time.

Teachers were allowed to have several attempts while completing the most difficult or the most important tasks from the online courses' quizzes, concerning the use of special definitions, description of complicated phenomena of inclusion and inclusive education, etc.

It should be noted that almost all teachers (50 teachers, 83.3%) used the chance to make their quizzes' results better. Thus, they revised the material, looked through the course's steps as much time as they need memorizing necessary information.

Mostly, video materials were used for explanation of definitions, analyzing real-life situations connected with working in inclusive educational environment. Combining visual information with its verbal presentation helps to expand teachers' knowledge, improve the insight of the topic, encourage teachers to argue, to think critically and complete problem-solving tasks. Most teachers liked these activities.

Different examples of situations from disabled children's life were also proposed to the teachers. They were asked to comment on the ideas presented in the video or offered their own solutions of the problems. These ideas could be also written in the chat.

Teachers' participation in webinars and online courses was evaluated taking into account several criteria: motivation, activity, comprehension of the topic.

3.3. Materials and Procedure

For *pedagogical observation*, we used such instruments as: matrix for observation for teachers' professional and pedagogical knowledge, skills of using inclusive forms of teaching in the educational process (art-therapy,

forms of speech correction, logorhythmics, logosensorics, elements of Montessori's forms of teaching, methods of social development (cards-«life stories», interactive books, etc.), modified matrix of lesson analysis (Khliebnikova, 2013), characteristics of the styles of teacher's pedagogical activity according to A. Markova and A. Nikonova (Markova & Nikonova, 1987). These matrixes were used in the process of lessons' watching and analysis.

The lessons were provided in inclusive classes (1-4th grades, primary school) of general secondary school number 38, Kharkiv, Ukraine. There were 4 lessons in each grade from 1 to 4, before (16 lessons) and after (16 lessons) experiment, totally 32 lessons.

The observation showed that the teachers, who provided the lessons, used elements of art therapy techniques, methods of speech development and correction; the elements of logarithmics and logosensory were not used enough. Elements of Montessori educational forms and methods of social development were not used.

Before the beginning and after the end of the classes, the level of teachers' inclusive competence was diagnosed. To do this, they filled out 3 questionnaires. Each questionnaire contained tasks designed to determine the level of knowledge and skills in the field of one of the following components of inclusive competence:

- motivational and personal, reflecting motivation and interest in the formation and improvement of their own inclusive knowledge, value orientations, personal and professional qualities for learning in an inclusive environment;

- cognitive-operational, reflecting the level and nature of the available inclusive knowledge and skills;

- reflexive-evaluative, characterizing the development of reflective thinking and the ability to analyze, the ability to evaluate and correct one's own behaviour in inclusive conditions (Kazachiner, 2018).

The tasks were used to check:

- knowledge of the content, principles, goals, pros and cons of inclusive education and an inclusive educational environment;

- knowledge of the legal framework (world documents on inclusive education, recommendations, letters of the Ministry of Education and Science, educational programs and plans, etc.) and ensuring inclusive education in different countries;

- peculiarities of working with different categories of children with special educational needs;

- methods of adaptation and modification of the educational environment;

- teachers' skills and abilities to work in a support team and cooperate with other teachers.

Each questionnaire contained five tasks of different difficulty levels.

One task of a closed type of the first level of complexity was presented in the form of tests, in which it was necessary:

- to choose the correct answer;
- to insert a suitable (from several proposed) term in the proposal;
- to define a term, a concept by its description.

This assignment tested the level of knowledge of the basic concepts in the area of the corresponding component.

Two tasks of a semi-open and open type of the second difficulty level offered:

- to establish correspondences;
- to give a short answer to the question posed;
- to fill in the columns of the table;
- to list the features of this or that inclusive form of education;
- to choose from the proposed form, method and techniques of working with different categories of children with special educational needs.

These assignments made it possible to reveal a wider range of knowledge, skills and abilities of the teacher in the area of the corresponding component.

Two creative tasks of the third level of difficulty assumed the ability:

- to analyze a part of the lesson plan or situations from the practice of working with special children;

- to adapt or modify tasks for a child with a certain mental and physical development disorder.

The determination of the correctness of the assignments was carried out subjectively, taking into account the possible presence of some permissible inaccuracies that could be neglected.

The level of the teacher's inclusive competence in the field of each component was assessed on a three-level scale as follows. If a teacher completed two tasks of the third level and at least one task of the first or second level, then his level of competence was considered to be high. If a teacher completed only two tasks of the third level, or one task of the third level and at least two tasks of the first and second levels, or all tasks of the first and second levels, then his level of competence was considered to be average. The level of inclusive competence of the rest was considered to be low.

The general level of inclusive competence was determined as follows. If the levels of inclusive competence in the field of all components are high, or in the areas of two components are high, and in the third they are average, then the overall level is high. If the level of competence in the field of two components is average, then the general level is average, in other cases the level is considered to be low.

4. Results and Discussion

4.1. Survey results

The distribution of the number of teachers by their levels of inclusive competence is presented in Table 3.

Table 3 – Level of English teachers' inclusive competence development at the ascertaining and control stage of experiment (groups K and E)

Levels	Number of teachers			
	Ascertaining stage (number of teachers / %)		Control stage (number of teachers / %)	
	Group K	Group E	Group K	Group E
High	12 20%	10 16,7%	12 20%	28 46.7%
Average	30 50%	28 46,6%	32 53,3%	24 40%
Low	18 30%	22 36,7%	16 26,7%	8 13,3%
χ^2_{emp}	0,4		10,21	

(Source: Authors own contribution)

Since we have adopted a level grading scale, we used the criterion of homogeneity χ^2 (method χ^2) to check the statistical significance of the differentiation (difference) of the two groups' indicators (Novikov, 2004).

In order to be sure that the chosen organization of education in the system of postgraduate education influenced the achieved level of knowledge, we had to make sure that at the ascertaining stage of the experiment the characteristics of groups K and E coincided on the teachers' level of inclusive competence development.

In order to assume that the impact of the introduced types of educational organization was significant, we had to make sure that, teachers of groups K and E demonstrated significantly different levels of their inclusive competence at the control stage of the experiment.

In order to establish the reliability of the coincidence or non-coincidence of the characteristics of groups K and E at the ascertaining and experimental stages, statistical hypotheses were investigated:

- on the absence of differences (null hypothesis);
- on the significance of differences (alternative hypothesis).

Empirical values of the criterion were calculated by the formula:

$$\chi^2_{emp} = N \cdot M \cdot \sum_{i=1}^{3} [(n_i : N - m_i : M)^2 : (n_i + m_i)], \text{ where:}$$

N – the number of teachers in control group E1;

M – the number of teachers in experimental group E2;

i – level sign (1 – high, 2 – average, 3 – low);

$\sum_{i=1}^{3}$ – the sum of terms on i from 1 (high level) to 3 (low level);

n_i – number of teachers from group E, who got level i;

m_i – number of teachers from group E, who got level i (Novikov, 2004).

The critical value of $\chi^2 0,05$ if $\alpha = 0,05$ (the probability of error is not more than 5%) for a three-level evaluation system is 5,99.

Investigation of the criterion of homogeneity χ^2 in groups K and E showed that at the ascertaining stage of the experiment (before training) the empirical value of the criterion did not exceed its critical value 5,99 (for three levels of assessment, by level of significance $\alpha=0,05$) :

$\chi^2_{emp,1} = 0,4 < 5,99$.

This indicates that before training, the characteristics of groups K and E in the inclusive competence development coincided.

Investigation of the criterion of homogeneity χ^2 in groups K and E showed that at the control stage of the experiment (after training) the empirical value of χ^2 criterion exceeded the critical value of 5.99 (by level of significance $(1-\alpha)=0,95$) :

$\chi^2_{emp,2} = 10,21 > 5,99$.

This indicates that the difference in the characteristics of groups К and E in the development of inclusive competence is significant and depends largely on the organization of training.

A comparison of the total number (%) of teachers who have high and medium levels after training, showed:

E (46,7%+40%=86,7%)> K (20%+53,3%=73,3%).

Comparison of the increase in the total number of teachers with a high and an average level for each group separately showed:

E (86,7%-63,3%=23,4%)> K (73,7%-70%=3,3%).

Thus, the level of inclusive competence of teachers trained under the improved organization, including participation in online courses and webinars using ICT tools, is higher than that of teachers under the existing organization of professional development.

Thus, the effectiveness of ICT tools and their positive impact on the teachers' inclusive competence development in postgraduate education was experimentally proved. We were able to make sure that the change in data between the two groups was the result of modifications to the conditions that we created, and not the result of external, uncontrolled factors.

So, we can conclude that our hypothesis is confirmed.

4. Discussions and conclusions

In modern conditions of information and communication technologies' rapid development, the educational process in institutions of postgraduate pedagogical education must respond flexibly and in a timely manner to changes in the educational space. In particular, this is due to the sharp increase in general secondary education institutions for children with special educational needs and, accordingly, the need for teachers to work with such students, in other words, their inclusive competence development. This requires postgraduate pedagogical education institutions to improve the content and methods of training in accordance with, firstly, the conceptual provisions of inclusive education and their implementation in general secondary education, and secondly, with the emergence of a significant number of educational platforms, where a teacher can find a variety of online courses and webinars to familiarize himself with these provisions.

We offered to modernize and improve the content of the topic «Technologies of inclusive education» of the current programs of postgraduate training foreign language teachers by presenting forms, methods and techniques of ICT for inclusive education, and teacher training

in this area. The results of our research were tested by lecturers in professional and postgraduate education both during sessions of advanced training courses and during teachers' participation in thematic special courses.

In accordance with the international relevance of online learning necessity our study gives a chance to transform the system of postgraduate pedagogical education into one that is able to respond quickly to the needs of teachers to expand their professional opportunities for the use of ICT-resources not only during face-to-face and distance learning courses, but also in informal and informal education. The use of mentioned ICT resources brings new and worthy in the field of inclusive education development, postgraduate and professional pedagogical education which provide for the possibility of teacher's self-education and self-improvement by means of ICT at international level. Educators and course developers in the sphere of inclusive education, in the sphere of postgraduate education both in Ukraine and abroad, can also use the results of this study.

Based on the experimental study data, we can conclude about the effectiveness and efficiency of the use of online courses and webinars from different educational platforms for teachers' inclusive competence development in the postgraduate education.

Prospects for further research in this area are seen in the development of guidelines for different categories of teachers on the use of ICT to develop their own inclusive competence not only in institutions of postgraduate pedagogical education during training, but also in non-formal and informal teacher education, as well as for use by employees of institutions of higher and postgraduate pedagogical education. Thus, in the future we plan to expand the search for online educational resources on various issues of inclusive education to familiarize teachers of different subjects of the school cycle with the capabilities in order to promote the effective development of teacher's inclusive competence as an integral part of his professional competence.

5. Conflict of interests

The authors declare that there is no conflict of interests.

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