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FEATURES OF TRAINING FUTURE CHEMISTRY TEACHERS IN THE CONTEXT OF INCLUSIVE EDUCATION

Abstract

This paper is devoted to the specific features of training chemistry teachers in the context of inclusive education. Notably, the purpose of this training is to master the relevant methodological, subject and pedagogical information, knowledge and skills in correctional pedagogy and psychology. The components of the readiness of future chemistry teachers in the context of inclusive education are determined and groups of professional tasks that reflect their professional awareness are formulated. The relevance of the subject matter is conditioned by the fact that the process of inclusive education of disabled children has been developing in general education schools in recent years. An inclusive approach requires the reform of the entire education system, which should apply new approaches to learning to meet the educational needs of these children. There are many problems on the way of this process, due to its insufficient provision with psychological, pedagogical, social, material and other conditions. One of the main problems is the training of chemistry teachers at the stage of teaching in a secondary school. The purpose of this study is the theoretical substantiation of the structural and functional model of training students (future chemistry teachers) for the implementation of inclusive education for children with learning disabilities. For this purpose, the following methods were used: analysis of theoretical sources, discussion, and pedagogical modelling. A theoretical model has been developed, which is a didactic system that ensures the establishment of professional and personal readiness of the future chimtry teacher in the implementation of inclusive education in three sectors: theoretical, practical, and individual readiness. The content component of the model is determined by the material of the "Pedagogy" course. The developed model of training future chemistry teachers will provide them with the necessary competencies for effective professional work in the field of inclusive education.

Keywords: inclusive education, professional competence, training of future chemistry teachers, professional training of teachers.

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ИНКЛЮЗИВТІ БІЛІМ БЕРУ ЖАҒДАЙЫНДА БОЛАШАҚ ХИМИЯ МҰҒАЛІМДЕРІН ДАЯРЛАУ ЕРЕКШЕЛІКТЕРІ

Аңдатпа

Бұл мақала инклюзивті білім беру жағдайында химия мұғалімдерін даярлау ерекшеліктеріне арналған. Бұл мақаланың мақсаты – арнайы педагогика мен психология саласындағы білім мен дағдыларды, тиісті әдіснамалық, пәндік және педагогикалық ақпаратты меңгеру болып табылады. Инклюзивті білім беру жағдайында болашақ химия мұғалімдердің дайындық компоненттері

анықталды және олардың кәсіби хабардарлығын көрсететін кәсіби міндеттер топтары тұжырымдалды. Тақырыптың өзектілігі – соңғы жылдары жалпы білім беретін мектептерде ерекше білім беруге қажеттілігі бар балаларға инклюзивті білім беру процесі дамып келе жатқандығы. Инклюзивті тәсіл бүкіл білім беру жүйесін реформалауды талап етеді, ол осы балалардың білім беру қажеттіліктерін қанағаттандыру үшін оқытудың жаңа тәсілдері қолданылуы керек. Бұл процесс барысында оның психологиялық, педагогикалық, әлеуметтік, материалдық және басқа жағдайлармен жеткіліксіз қамтамасыз етілуіне байланысты көптеген мәселелер кездеседі. Негізгі мәселелердің бірі – орта мектепте оқыту кезеңінде химия мұғалімдерін даярлау. Бұл зерттеудің мақсаты студенттерді (болашақ химия мұғалімдерін) оқытуда ерекше білім беруге қажеттілігі бар балаларға арналған инклюзивті білім беруді жүзеге асыруға дайындаудың құрылымдық-функционалдық моделін теориялық негіздеу болып табылады. Осы мақсатта келесі әдістер қолданылды: теориялық дереккөздерді талдау, пікірталас және педагогикалық модельдеу. Болашақ химия мұғалімдерінің үш секторда инклюзивті білім беруді жүзеге асыруға кәсіби және жеке дайындығын қалыптастыруды қамтамасыз ететін дидактикалық жүйе болып табылатын теориялық модель жасалды: теориялық, практикалық және жеке дайындық. Модельдің мазмұндық компоненті "Педагогика" курсының материалымен анықталады. Болашақ химия мұғалімдерін даярлаудың әзірленген моделі оларды инклюзивті білім беру саласындағы тиімді кәсіби жұмыс үшін қажетті құзыреттіліктермен қамтамасыз етеді.

Түйін сөздер: инклюзивті білім беру, кәсіби құзыреттілік, болашақ химия мұғалімдерін даярлау, мұғалімдерді кәсіби даярлау**.**

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ОСОБЕННОСТИ ПОДГОТОВКИ БУДУЩИХ УЧИТЕЛЕЙ ХИМИИ В УСЛОВИЯХ ИНКЛЮЗИВНОГО ОБРАЗОВАНИЯ

Аннотация

Данная статья посвящена особенностям подготовки учителей химии в условиях инклюзивного образования. Целью данной статьи является приобретение знаний и умений в области специальной педагогики и психологии, соответствующей методологической, предметной и педагогической информации. В условиях инклюзивного образования определены компоненты подготовки будущих учителей химии и сформулированы группы профессиональных задач, отражающие их профессиональную осведомленность. Актуальностью темы является процесс развития инклюзивного образования детей с особыми образовательными потребностями в общеобразовательных школах в последние годы. Инклюзивный подход требует реформы всей системы образования, которая должна применять новые подходы к обучению для удовлетворения образовательных потребностей этих детей. На пути этого процесса существует много проблем, связанных с его недостаточным обеспечением психологическими, педагогическими, социальными, материальными и другими условиями. Подготовка учителей химии на этапе преподавания в средней школе – является одной из главных проблем. Примечательно, что целью данного исследования является теоретическое обоснование структурно–функциональной модели подготовки студентов (будущих учителей химии) к реализации инклюзивного образования для детей с особыми образовательными потребностями в обучении. Для этой цели были использованы следующие методы: анализ теоретических источников, дискуссия и педагогическое моделирование. Разработана теоретическая модель, представляющая собой дидактическую систему, обеспечивающую формирование профессиональной и личностной готовности будущего учителя химии к реализации инклюзивного образования в трех секторах: теоретическом, практическом и индивидуальной готовности. Содержательная составляющая модели определяется материалом курса "Педагогика". Разработанная модель подготовки будущих учителей

химии обеспечит их необходимыми компетенциями для эффективной профессиональной работы в сфере инклюзивного образования.

Ключевые слова: инклюзивное образование, профессиональная компетентность, подготовка будущих учителей химии, профессиональная подготовка учителей.

Introduction. The current stage of modernisation of education is primarily associated with the awareness and rethinking of society's attitude to children with disabilities [1-3]. The society's refusal to separate children is confirmed by the appearance of the term "children with special educational needs", which records a shift in emphasis from deviations from the norm in the physical or mental development of a child to fixing the needs of children in special educational conditions, to the responsibility of society for the implementation of these needs [4]. The issues of social, cultural, and educational inclusion of children with special educational needs are relevant in pedagogy and in the system of vocational education. Based on this, there is a need to transform the system of professional training of future teachers.

In modern conditions, inclusive education is considered a way to ensure access to high-quality education of the appropriate level for children with special educational needs, taking into account each child's abilities, capabilities, desires, and interests [5-7]. At the same time, inclusive education is a complex process of ensuring equal access to high-quality education for children with special educational needs by organising their education in general educational institutions based on the use of personalit-oriented teaching methods, taking into account the individual characteristics of the educational and cognitive activity of such children. The introduction of inclusive education is due to several factors, in particular, the need to ensure the right of every individual to education, in particular the rights of children with special educational needs, and according to the decisions of the Council of Europe and the International Standards Department [8; 9].

Inclusive education is an education in which every child, despite their physical, intellectual and psychological characteristics, is included in the general education system and studies together with their peers. Inclusion means the development of each student through an educational programme that is quite complex, but corresponds to the student's abilities. Inclusion considers the needs, special conditions, and support, which students and teachers need to achieve success. The integration of the educational space, its openness, leads to the general existence of various models and technologies of education – all this quite dramatically changes the idea of essential professional characteristics of a modern teacher [10-12]. In this perspective, the issue of improving the training of a qualified chemistry teacher for the implementation of inclusive education of school-age children is topical. The practice of introducing inclusive forms of education into the system of general educational institutions is complex, which is conditioned by the presence of barriers to general education, namely: insufficient awareness of the pedagogical corps of higher pedagogical educational institutions within this problem; lack of a systematic vision of the problem of inclusion and ways to solve it in various educational structures; priorities and values of modern general education schools are focused on results, not on the individual [13; 14]. Social partnership, as a mandatory attribute of inclusion, is replaced in general education by competition, where only the smart, beautiful, and strong are valued [15; 16].

The opinion that educational integration is introduced without a thorough special training of the teacher of the mass education system to work in the conditions of integration deserves special attention. Pedagogical universities do not have enough knowledge of technologies for preparing chemistry teachers to work in an inclusive environment [17-20]. In order to form students' professional competence in the field of development, education and upbringing of children with special needs, the "Fundamentals of Defectology" course is studied at the faculty of additional professional education. The general objectives of this course are to reveal the methodological and theoretical foundations of defectology as a complex branch of science that combines clinical, physiological, psychological and pedagogical lines of study of the learning processes of schoolchildren with learning disabilities both in special educational institutions and in general education schools, rehabilitation centres, families; familiarisation with inclusive education as the main innovative technology. The acquired knowledge and skills enable future chemistry teachers in an inclusive education to monitor the psychophysical and social development of students, take into account the characteristics of each student when drawing up an individual training and upbringing programme to correct the processes of development and socialisation of a student, in which these processes are damaged as a result of the influence of various factors; effectively organise interaction with families that raise children with special educational needs [2].

The purpose of this study is to investigate the conditions for preparing chemistry teachers to work in an inclusive environment as one of the ways of social rehabilitation of students with special educational needs.

Materials and Methods. The methodological basis for this study is the analysis of the fundamental works of modern researchers, which became the basis for an effective study of the specific features of training specialists in teaching chemistry in an inclusive environment. Furthermore, comparative and analytical research methods were used. Scientific methods of studying the features of training future chemistry teachers in inclusive education allow creating a clear system of rules, techniques, methods of influence to increase the effectiveness of teacher's training in the "Chemistry" course.

This study was conducted in several stages. At the first stage, the study reveals the content of the concepts "inclusive education", "professional competence of teachers", "training of future chemistry teachers", "professional training of teachers". The requirements for the training of future chemistry teachers in inclusive education are determined; the issues of improving the quality of presentation of material for schoolchildren with special educational needs and creating the necessary conditions for the teacher to achieve success in social adaptation by all schoolchildren, regardless of individual characteristics, are considered. In accordance with the objectives of this stage of the study, the analysis method was applied, which is the most universal and widely used method used during research. The analysis of the mastered scientific literature is carried out, based on which the state of the issue under study is determined, the main features of the training of future specialists in the conditions of inclusive education are analysed and summarised. The method of analysis in the process of theoretical comprehension of the subject being mastered allows decomposing any phenomenon into all its components, and also analyse them according to all possible criteria that correspond to the goal set for the researcher.

At the second stage, the reference evaluation was used. The purpose of the method is a comparative analysis based on exemplary indicators, to establish the need for changes and the probability of success as a result of these changes on the basis of the study. Reference evaluation is carried out within the framework of competitive analysis and is not an innovation for most studies, although this method is more detailed and ordered than, for example, the method or approach of competitive analysis.

At the third stage of the study, the theoretical provisions were clarified, their results were summed up. The results of the conducted research were processed, theoretically generalised and systematised, the study materials were unified. This study presents the results of an empirical research that examined the features of the training of chemistry teachers, and the degree of awareness of future teachers and specialists of educational institutions in the field of inclusive education. The author describes the stages of the entire study, presents the results and a detailed analysis of scientific sources.

Based on the results, conclusions are drawn about the need to create conditions for the training of chemistry teachers in an inclusive education, which is one of the key obstacles in the establishment of an inclusive modern environment. The paper gives recommendations to future chemistry teachers on creating conditions for inclusive education that are adequate to the needs of schoolchildren with special educational needs. The most important conditions include the creation by the teacher of a psychologically comfortable environment for the student and ensuring a sufficient level of competence of the teacher of the educational organisation.

Results of research. The development of an inclusive education system is a long-term strategy that requires patience and tolerance, consistency, continuity, and an integrated approach to its implementation, according to international experience. A special place in this system is occupied by a teacher. The development of inclusive education in the education system depends on teacher's emotional stability, readiness to accept children with special educational needs. The studies by Aaldering, Leker [2], Bachrach [6], Badr [7], Castillo[10], Domeniconi [11], Mills [13], Zhomartova [20], Burdina [20], et al. are devoted to this problem. However, this situation in Kazakhstan is little mastered and requires additional studies. In addition, there are practically no methods of forming emotional stability, tolerance, empathy, and in general, psychological training of chemistry teachers in general education schools in the implementation of inclusive education. Inclusive education is understood as a process of general education and training of all schoolchildren. During such education, children with disabilities can achieve the most complete progress in social and psychological development [9].

The methodological basis of any science is determined by a set of philosophical, general scientific, specific and interdisciplinary approaches and initial positions, categories, representations, from the position of which the phenomena of pedagogy are explained and their regularities are revealed. Science investigates the phenomena and laws of the modern world that exist independently of human consciousness. The basis of

science is the collection, updating, and classification, a detailed analysis of facts, the understanding of new knowledge or generalisations that describe natural or social phenomena, the study of which allows establishing cause-and-effect relationships between phenomena and predicting their course.

The problem of teaching and educating a student, the accumulation of knowledge that underlies the organisation, design and forecasting of the conditions for improving the educational process aimed at the formation and formation of personality, has been formed into the science of pedagogy. "Pedagogy" (translated as "education") – the union of theoretical and applied sciences that master the processes of education, training, and personality development. "Pedagogy" as a term got its name from the Greek words "paidos" – child and "ago" – to lead. Literally translated, "paidagogos" means "those who lead children". Over time, the term "pedagogy" began to be used more extensively: to define the art of leading a child throughout life. That is, to foster, train, and educate. Thus, pedagogy has become the science of the development and education of children [3].

The current pedagogy is considered as the art of upbringing, education and training of the younger generation, adults and other segments of the population. It examines the processes of upbringing, education, and training as a conscious and systematic process of preparing a person for life and work, reveals its essence, regularity, processes and rules that regulate educational activities in various types of educational institutions. Now the number of children with behaviour that does not correspond to the established norm, which is associated with unfavourable changes in society, is rapidly growing. All changes in the psychophysical state of a person and their consequences, both positive and negative, generate increased tension, cause changes in health, while the indicators of mental disorders and diseases are increasing. The problem was also getting an education for children with such problems, because the conditions for their successful socialisation and ensuring full participation in public life are violated.

Until recently, the education of children was of a differentiated nature: the education of children with normative development in general education schools, to which conventionally recognised forms and methods of education were applied; the education of children with disabilities in special educational institutions (children with different levels of psychophysical development, including the gifted ones). An important step in the reform of education in this direction is the philosophy of inclusive education, which is based on the belief in the need to change the educational paradigm – the unification of two traditional systems into a single education system. The indicated reform does not provide for the liquidation of these educational institutions.

Inclusion is the process of increasing the degree of participation of all citizens in social life, and first of all, those who have difficulties in physical and mental development [15]. Inclusion means the full involvement of children with learning disabilities in the educational process of a comprehensive school, the life of the whole class; the process of finding effective methods and forms of education and upbringing that would satisfy the individual needs of all students; the creation of a flexible education system. The purpose of inclusion is to create such a socio–cultural environment of a general educational institution that would satisfy the individual educational needs of all students, regardless of the specifics of their psychophysical development.

The relevance of the introduction of inclusion in the general education process is confirmed by the fact that almost 20% of children come to school with health disorders, 50% of students have pronounced individual characteristics, a significant part of children has physiological, pedagogical, psychological, and social behavioural deviations from the norms established in society and education. In the context of inclusion, inclusive education implies the full adaptation of the educational process to each student, taking into account the specific differences of each individual child. The basis for this is the adaptation of the educational environment to each child, and not the child to the educational environment. As a result of the student's adaptation to society, it is necessary to provide for their socialisation not only in the educational process, but how comfortable all participants in the educational process feel in this team: average children, children with special educational needs, teachers, parents; how the atmosphere of this integral pedagogical process contributes to the creativity and self-development of each individual.

The methodological basis of inclusion is the synthesis of a new theory, which includes knowledge of philosophy, general pedagogy, special pedagogy and psychology, general psychology, age and pedagogical psychology, medicine and other sciences. Among the main directions of the inclusion methodology, researchers determine: preparing society to accept the status of equal education regardless of the psychophysiological characteristics of children; broad coverage of the goals, objectives and directions of inclusive education in the mass media; transition from a defect-oriented approach to maintaining the

development of the potential of each student; diversification of the content of school education to ensure the educational interests and needs of all categories of schoolchildren; training of teaching staff for pedagogical activity in an inclusive environment.

Inclusion is associated with the definition of new knowledge about the joint education of children in a general educational space, regardless of their age, level of psychophysical development, socio-economic status. The knowledge based on the ideas of inclusion, the principles of humanistic pedagogy, the new educational paradigm is called upon to substantiate the laws of the pedagogy of inclusive education, training, and upbringing. They are designed to provide the theoretical foundations of pedagogical processes in the conditions of inclusion, substantiate the use of adequate methods, forms of joint education of children with different levels of psychophysical development in the conditions of general education. Thus, a new branch of pedagogical knowledge is being formed – inclusive pedagogy.

The methodological basis of inclusive pedagogy is [4]: the philosophy of education. The philosophy of education as a scientific direction is in a state of formation, but it appears as a theory of education. In the modern world, the "philosophy of education" is defined as a set of worldview theories that determine the methodology of education and training, the formation of an appropriate type of personality. From the standpoint of philosophy, education (and upbringing) is the transformation of the "spirit of the epoch" into the structure of consciousness, worldview, spiritual world, culture and the general nature of the individual. The main directions of the philosophy of education: 1) the concept of harmonious integrity, which promotes the implementation of the ideas of creating a unified, holistic, harmonious theory of pedagogy and a centralised education management system; 2) a pluralistic concept that recognises the need to apply the principles of pluralism, progressive education, and relativism in pedagogical activity, the priority of the role of individual interests over public ones; 3) a synthetic concept that combines both previous concepts of education, determining that common, public interests in the pedagogical process should be minimal. Taking this into account, inclusion is considered as a form of joint life of ordinary people and people with disabilities, which implies their socialisation at all stages of their life, including at all levels of education. The philosophy of inclusive education is associated with a new paradigm of education – the creation of a unified education system that will become the centre of correctional and developmental work. Inclusive education is not identified with teaching in classes of compensatory learning and special (correctional) classes functioning in general educational institutions; pedagogical theory that defines the essence of a purposeful pedagogical process, the main laws, goals, methods and forms in the conditions of inclusive education; psychological concepts that explain the mechanisms of development, personality formation and socialisation of a child in the conditions of inclusion [9].

Each branch of new knowledge is allocated to science when only its inherent object and subject of research, the terminology, is defined. The object of research of inclusive pedagogy is the reality that determines the development of a human individual in the process of upbringing and education; the system of pedagogical phenomena associated with the development of an individual in the conditions of inclusion. That is what inclusive pedagogy studies and describes. Inclusive pedagogy studies the patterns of a child's mental development, the causes of disorders in their development and behaviour, develops ways and means to overcome them, identifies obstacles to meeting the individual needs of all students. The subject of the study of inclusive pedagogy is the process of professional activity of specialists authorised by the state, aimed at meeting the individual needs of all children in the conditions of receiving education in an inclusive general educational institution. According to the object and subject of the study, the purpose of inclusive pedagogy is to explain, describe and predict pedagogical processes and phenomena that occur in a specially organised socio–cultural educational environment for co-education and upbringing of healthy children and children with various types of nosology.

The tasks of inclusive pedagogy include: development of new and modernisation of existing methods of teaching and upbringing, educational equipment; preparation of textbooks, manuals and educational and methodological support; definition of the functions of the socio-pedagogical activity of the teacher of inclusive education; preparation of teachers of general education schools to perform socio-pedagogical activities and its functions: communicative, protective, diagnostic, preventive, correctional-developing, rehabilitative, socio-therapeutic; strengthening of the social-lising and correctional-developing goals of the lesson.

Inclusive pedagogy is a branch of the system of pedagogical sciences that studies the process of joint education and upbringing of children and children with learning disabilities and searches for effective ways to meet the individual needs of all students in a general educational institution [18]. According to many

researchers, the preparation of a chemistry teacher in an inclusive education consists of the following justified periods: the development of a creative style; comprehension of the basics of the methodology of scientific knowledge and pedagogical study; mastering the technology of innovative activity, practical skills for inclusion in inclusive education.

The training of chemistry teachers to present the material to schoolchildren with special educational needs is currently becoming extremely relevant. It is noted that for the professional and personal training of chemistry teachers, the following knowledge of psychology and pedagogy is required: the idea and awareness that inclusive education differs from conventional forms of education; the ability to implement all possible methods of pedagogical interaction between all objects of the educational environment (with each student separately and together in the classroom, with their parents, teachers, specialists, school administration). Consequently, the preparation of chemistry teachers for teaching in an inclusive education is a creative process of creating and forming professional awareness of chemistry teachers, containing motivational, epistemological, projective, reflexive, and activity components [13]. Scientists who have studied the nature of awareness concentrate their interest on its versatile and systematic nature. Why the judgment "professional awareness of the teacher" in the research papers of various authors is interpreted not quite the same.

In recent years, special interest of researchers has been focused on the subjective and personal aspect of the development of professional initiative and the implementation of actions by a teacher as a special professional pedagogical activity. As for the specifics of the professional awareness of chemistry teachers who implement the process of inclusive education in practice, this separate branch is still understudied. The structure of inclusive awareness includes motivational, cognitive, reflexive, and operational components. The motivational component of inclusive awareness of chemistry teachers contains motivational competence, which is characterised by a perfect personal interest, a positive aspiration to implement pedagogical activities in the conditions of inclusive education of schoolchildren with special educational needs in the environment of normally developing peers, a combination of motives (social, cognitive, professional, personal development and self–affirmation, personal well-being). Motivational awareness is conditioned as an opportunity to motivate oneself to fulfil conditioned professional influences based on the value aggregates, needs, motives that are adequate to the goals and objectives of inclusive education [17].

The cognitive component of inclusive awareness of chemistry teachers includes cognitive competence, which is defined as the ability to think pedagogically on the basis of a system of cognitions necessary for the implementation of inclusive education, the ability to perceive, store in memory and display at the right time information essential for solving theoretical and practical problems of inclusive education at school. The reflexive component of inclusive awareness of chemistry teachers includes reflexive competence, manifested in the ability to analyse personal educational and professional activities combined with the implementation of inclusive learning, during which intentional control over the results of their professional actions is carried out, consideration of actual pedagogical circumstances. The operational component of inclusive awareness of future chemistry teachers includes operational competencies, which are defined as the ability to perform specific professional tasks in the pedagogical process and represent the studied methods and experience of the teacher's activity necessary for the successful implementation of inclusive learning, the resolution of emerging pedagogical situations, methods of independent and mobile solution of pedagogical tasks, the implementation of search and research activities.

Discussion. The essence of modern reform of the system of professional training of a chemistry teacher is to study, generalise past experience, the best world achievements, introduce the scientific and organisational foundations of the activities of educational institutions, abandon the principles of authoritarianism, established in the totalitarian system, change the structure of the activities of teachers and students to stimulate creativity and initiative, the openness of the chemical education system based on new progressive world concepts, modern scientific, methodological and practical achievements [1]. In higher pedagogical educational institutions, new technologies for teaching chemistry are being introduced, which put the student at the centre of the educational process. Modern information and communication technologies of education provide a significant potential for improving chemical education in higher teacher's institutions. Summarising the theoretical material on this problem, based on practical experience, it can be concluded that the establishment of professional readiness of a chemistry teacher requires a holistic formation of professional qualities, knowledge and skills of a person.

To determine a sufficient level of qualification and professionalism, the term "professional competence" is used, which serves to establish a link between the knowledge and skills of a specialist. In particular, the

concept of competence includes the ability to choose the most optimal solutions and reasonably deny incorrect ones, have critical thinking, constantly update knowledge, apply the most appropriate method under certain conditions. The training of a competent specialist can be implemented by integrating the aspirations of the three leading factors: "compression", modularity and problematics, and building of new pedagogical technology on this basis [7].

Professional mobility (the readiness and ability of a chemistry teacher to quickly change the professional tasks performed, jobs that arise under the influence of technical transformations) is one of the important professional qualities. It is formed largely due to a thorough knowledge of chemistry and its integration with knowledge of other disciplines of the professional training system. The integration of subject knowledge and skills is one of the most effective means of forming professional mobility. Such an integral approach provides for the construction of a model of professional readiness for the organisation of experimental work of students, in which professionally significant personal qualities of a chemistry teacher who is able to successfully perform the tasks of teaching and educating students are synthesised. The analysis of the state of professional training of chemistry teachers adopted in this study allowed drawing the following conclusions: the model of professional training of chemistry teachers has to be based on new approaches to the professionalism of the teacher as a certain integrative education, which allows carrying out effective pedagogical activity in specific conditions of schools of different types; the professional competence of a chemistry teacher is associated with knowledge of the discipline in which the future teacher specialises; knowledge concerning the management of the process of cognition; knowledge on the organisation of the chemical education system; a new organisational model of professional training of a teacher should be based on the concept of its fundamental nature, a combination of theory and practice, strengthening the professional orientation of special training of a future chemistry teacher; development and the reform of chemical education in higher pedagogical educational institutions in recent decades has been largely determined by modern international pedagogical ideas.

The model of professional training should be predictive in relation to the model of professional activity of a modern chemistry teacher, and also take into account the principle of variability, which allows teaching teams of educational institutions to choose and design the teaching process according to any scientifically based model concerning the management of the process of cognition; knowledge on the organisation of the system of chemical education; the new organisational model of professional training of a teacher should be based on the concept of its fundamentalisation, a combination of theory and practice, strengthening the professional orientation of special training of a future chemistry teacher; the development and reform of chemical education in higher pedagogical educational institutions in Ukraine in recent decades are largely determined by modern international pedagogical ideas (professionalisation, integration, universalisation. The model of professional training should be predictive in relation to the model of professional activity of a modern chemistry teacher, and also take into account the principle of variability, which allows teaching teams of educational institutions to choose and design the teaching process according to any scientifically based model. The analysis of trends in the development of general chemical education at the beginning of the 21st century, on the one hand, indicates its humanistic foundations, and on the other – the need to improve the system of studying chemistry [3].

The tasks of improving the quality of professional training of future chemistry teachers put increased requirements both to the content and to the form of presentation of educational material. Therefore, the courses of chemical disciplines in terms of content should reflect the system of chemical knowledge, contribute to the development of a system of special subject, socio–intellectual, and organisational and cognitive skills; contain the experience of creative activity of mankind in the fields of chemistry and attitude to the surrounding reality, certain value orientations. The system of teaching chemistry in higher pedagogical educational institutions can be formed only as a result of pedagogical research of the scientific and methodological foundations of the development of the content and effective technologies of students' educational activities and the psychological and pedagogical substantiation of the organisation of educational events. The construction of a modern chemistry teaching system requires taking into account the possibilities of information and communication technologies, the emergence of a step-by-step education system, and the trends of personality-oriented learning. According to the activity approach, a person acquires knowledge only when they really see the expediency of this knowledge for a future profession, can make it a means of his activity. The motivation of professional activity is decisive in the multifaceted motivational sphere of the individual [6]. The quality of training significantly depends, firstly, on the content and organisation of the educational process, and secondly, on the ability and desire of students to work, rationally use academic and

non–academic time, especially in the first courses. Improving the content and organisation of the educational process in the chemistry course requires an integrated approach.

It is worth noting the necessary features of the training of chemistry teachers in the conditions of inclusive education concerning diagnostic activities. An actual criterion for the professional orientation of chemistry teachers is the ability to design the directions of educational, correctional and educational activities, to provide for their results. In constructive and design activities, the ability to design one's own pedagogical activity, model pedagogical situations, and select effective means of influencing children is important. Important organisational skills include the ability to manage the behaviour and educational activities of children, to organise the educational process at the chemistry department, where children with different levels of development are trained, to carry out an individual approach, to conduct preventive and explanatory work with parents, to work in a team.

The skills related to research activities will be relevant, and they provide for the ability to collect and process pedagogical information, carry out experimental activities to find and develop new methods, means of influencing students. Such requirements for the professional competence of teachers are a guide in the process of improving their qualifications. However, a significant number of teachers are experiencing difficulties because they do not have such knowledge, do not have experience working in a team, do not use the knowledge and experience of colleagues, parents in organising the educational process of people with special educational needs. Taking this into account, it is important to prepare teachers for professional activity, provide them with knowledge of special and social pedagogy, provide them with tools and models of alternative education. If teachers are armed with such knowledge and receive proper professional training, then their level of psychological readiness has significantly increased. Thus, the psychological readiness of a teacher to work in an inclusive classroom directly depends on their professional competence. The lecture form of conducting classes in an interactive form becomes important for the development of professional and psychological readiness of teachers for activities in inclusive classes. The problem is that most of them do not fully understand the essence and advantages of inclusion, because they have a preconceived idea about this problem [8].

At the present stage, the emotional response of Kazakh teachers has a wide range from scepticism about the very idea of inclusive education to outright horror at the mere thought of the load. Elementary information ignorance, insufficient knowledge of pedagogical technologies and the basics of psychology and correctional pedagogy, emotional rejection of children with different types of disabilities and mental unwillingness to involve such children in the usual school activities are the main arguments of the teachers' position. This attitude is mainly accompanied by personal sympathy for sick children and their parents, but it is premature to talk about the proper level of professional psychological and pedagogical readiness [4]. Only a true understanding by chemistry teachers of the advantages and necessity of inclusive education, a belief in the benefits of inclusion for society would help to form a positive attitude to such a model of education. Explanatory work during a lecture session on chemistry, communication, and persuasion is necessary. Another important step for the successful functioning of inclusive education and the formation of professional competence of teachers is the cooperation of special and general secondary education.

For future chemistry teachers in the context of inclusive education, participation in various symposiums, seminars, conferences of specialists, where the issues of inclusive education are considered, is a necessary point. The same positive effect can be observed when participating in the form of thematic discussions, that is, a round table. Certain competent persons are invited to such classes – specialists who have experience in working with children with special educational needs and appropriate education. They prepare reports and speeches in advance that deserve attention in the classroom. After that, the stage of discussion, analysis, commenting, and exchange of opinions begins. It is also possible to widely use technical means, materials from the periodical press, diagrams, illustrative examples, video materials, and the like. During the master class, as one of the modern forms of conducting a training seminar for practicing practical skills on various methods and technologies to improve the professional level and exchange the experience of participants, students of advanced training courses have the opportunity to get acquainted with new technologies and methods, author's best practices [4].

The best specialists in the field of special education who have many years of experience working with children with special needs are invited to participate in the master classes. The key to the successful assimilation of the master class topic is the productive activity of all participants, the result of which is a model of the lesson developed by the "teacher–student" under the guidance of the "teacher–master" for the purpose of its further practical application in their own activities. Thus, the master teacher opens to the

participants the author's system of educational activities with children with special educational needs. An important step for the development of a teacher's professional readiness to work in an inclusive environment is the organisation of mentoring at the Institute of postgraduate education for teachers who start working in an inclusive classroom. Mentoring is one of the forms of professional development of young teachers who have up to 3 years of professional experience or need methodological assistance and newly appointed teachers. During the first two years, they must work with experienced chemistry teachers. At the institute of postgraduate pedagogical education, this form of activity can be differentiated into the organisation of a creative group of experienced teachers who work for a long time with children with special educational needs and can be mentors for beginners [10].

The main activities of the creative mentoring group are planning and implementing activities by experienced teachers together with beginners who have recently been working with children with special educational needs, namely: planning and implementing measures together with beginners to deepen pedagogical knowledge on organising activities with children with special educational needs, teaching methodology, studying directive materials; deepening scientific and theoretical training of the features of the development of children with special educational needs and methods of conducting classes in an inclusive environment, replenishing knowledge on correctional pedagogy and psychology; helping teachers to solve specific problems of teaching methods of subjects in an inclusive classroom organisation of consultations, classes during which there is modelling and discussion of the proposed models, extracurricular activities, production of samples of didactic materials under the guidance of a mentor; attendance of classes and extracurricular activities with mandatory subsequent discussion, planning of correction of the activities of a teacher who has just started working in an inclusive environment; advising a novice teacher on the organisation of the educational process in an inclusive classroom [16].

The methods of professional activity are dialogue, consideration of the situation, making decisions and agreements, activity plans, attending classes in inclusive classes, providing advice, and the like. There are three models of advice that characterise support and mentoring: interventions – the role of an experienced teacher is directive and leading, the transmission of information dominates with an emphasis on the explanation and application of knowledge and skills; assistance as the role of an experienced teacher is advisory. Experienced teacher's interaction with the newcomer is reduced to advice, encouragement and explanation. An experienced teacher provides materials designed for the appropriate purpose, and also contributes to the discussion and consideration of concepts. An experienced teacher chooses the role of a decision coordinator and is an observer. This model is focused on the interactive methodology of professional activity and improves the quality of processes and actions; cooperation – an experienced teacher acts as a critical friend or colleague, their relationship is interdependent and is a source of mutual learning, shared responsibility, exchange of experience or perspective. Materials and ideas are developed jointly. The result of the methodical professional activity of the creative group is the formation of creative activity, the development of the initiative of novice teachers, the growth of their authority [13].

The development of inclusive education in schools is a complex, versatile process that affects scientific, methodological, and administrative resources. Teachers and the administration of an educational institution who have accepted the idea of inclusion are particularly in need of help in organising the pedagogical process, working out the mechanism of adaptation between all participants in the educational process, where the child is the central figure. An inclusive space implies openness and accessibility not only for children, but also for adults. The optimal process of forming a teacher's psychological readiness for the integration of children can be built based on the inclusion of a programme in the curriculum that would increase the interest of teachers in inclusive practice, development of their skills for independent acquisition of knowledge and their application in organising work with children with disabilities. The development of tolerance, positive attitude, empathy for children with disabilities, the removal of psychological stress and the establishment of positive motivation to work with children with special educational needs.

Conclusion. Inclusion in social relationships and inclusion in educational processes is currently being introduced as the leading ideology of attitude to people with disabilities around the world. But at the same time, the systematic introduction of inclusive education is being carried out very slowly and rather unevenly. The training of chemistry teachers for inclusive education shows itself to be one of the stages of the implementation of inclusion itself. At this stage, the solution of this problem causes difficulties, both in matters of organisation and methodological nature. Since chemistry teachers who provide the educational process often do not understand the specifics of working with children with learning disabilities, do not know how to adequately assess potential difficulties in implementing inclusive education, the level of their own

preparation for overcoming them, which can significantly not only harm the further socialisation of such children, but also create a significant threat to their safety. Since a chemistry teacher in the implementation of inclusive education is forced to work in difficult conditions that are associated with ensuring the safety of classes with chemical reagents for all participants in the educational process, it is necessary to theoretically argue and outline the process of forming the training of future specialists to work in these newly created, existing conditions. The training of highly qualified teachers who are able to work in transformed conditions involves the use of a model for creating the readiness of future chemistry teachers to work in inclusive education, built based on systematic, competence and activity, and axiological approaches. It is extremely important to take into account the organisational and pedagogical conditions that will ensure the development of such readiness.

During the study, the essence of the concept of inclusive education was determined, which is defined as part of the entire educational process, implying accessibility of education for all, in terms of adaptation to the diverse needs of all schoolchildren, which provides access to education for children with learning disabilities. The analysis of scientific, scientific-methodical and pedagogical literature allowed clarifying the definition of the readiness of the future chemistry teacher to work with students in an inclusive environment. All this should be understood as a set of knowledge and ideas about the characteristics of students with special educational needs, knowledge of ways and techniques of working with these students in inclusive education, development of certain personal qualities that provide stable motivation for this activity.

The obtained results of all stages of the subject under consideration reveal prospects for further study of the features of training future chemistry teachers in the conditions of inclusive education in the field of higher professional education.

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ИНКЛЮЗИВТІ БІЛІМ БЕРУДЕГІ ПЕДАГОГ МАМАНДАРДЫҢ КӘСІБИ ҚҰЗЫРЕТТІЛІКТЕРІН ҚАЛЫПТАСТЫРУ

Аңдатпа

Бұл мақалада инклюзивті білім беруді ұйымдастырудағы педагогтердің кәсіби құзыреттілігін қалыптастырудың өзектілігі қарастырылады. Отандық, шет елдік ғылыми әдебиеттердегі және құқықтық-нормативтік құжаттардағы мүмкіндігі шектеулі балаларды оқыту мен тәрбиелеу мәселелері талданды. Мақалада жалпы мектептердегі инклюзивтік білім беруді ұйымдастыру қызметін дамыту қажеттілігіне ерекше назар аударылады. Бұл зерттеудің негізгі идеясы елімізде жылдан-жылға ерекше балалардың санының көбейіп бара жатырғандығы және оларға білім мен тәрбие беру үрдісін дамыту қажеттілігімен байланысты. Бұл зерттеу инклюзивті білім берудің, яғни педагогтардың кәсіби сапасын дамытудың терең жатқан мәселелерін шешуге бағытталған. Мақалада инклюзивтік білім беруді ұйымдастыру үшін педагогтардың кәсіби құзіреттілігін қалыптастырудың ғылыми–педагогикалық зерттеулеріне жасалған аналитикалық талдау жасалды, алынған сауалнама педагогтардың инклюзивтік оқытудағы әдіс–тәсілдерді пайдаланудың психологиялы-педагогикалық жағдайлары мен мүмкіндіктерін анықтауға негіз болады.

Түйін сөздер: инклюзивтік білім беру, кәсіби құзіреттілік, педагогтер, құзыреттілік, ғылыми интеграция.