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Formation and Diagnosis of Future Teachers' Competences Based on the Case Method

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Abstract. The competence format of the federal state educational standards of higher education implies not only a new design of training results in the form of a system of universal, general professional and professional competencies, but also the introduction of active and interactive learning technologies and assessment of the level of their formation and development at all stages of mastering the basic professional educational program in higher education. *The aim* of the study is to substantiate the possibility of formation and diagnostics of universal, general professional and professional competencies of students – future teachers on the basis of case method. Competence, activity, system and qualimetric approaches were defined as methodological bases of the research. By the method of group expert evaluations, the structure and criteria for assessing the quality of the case method as a means of forming and diagnosing integrative learning outcomes of future teachers of preschool organizations were determined. In the process of research the structure of case method of modern pedagogical university was substantiated. The criteria for assessing the quality of the case method, which allow objectifying the procedures of diagnosing the competencies of future teachers, were established by the expert method. Thus, cognitive criterion, multifunctional criterion, profile criterion, latent criterion, and integrative criterion are presented. The materials of the study can be useful to the administration and teaching staff of universities for the formation and diagnosis of universal, general professional and professional competencies of students – future teachers of preschool organizations, as well as within the framework of their individual educational trajectories.

Keywords: case method, case structure, case quality criteria, competencies, individual educational trajectory, pre-school teacher.

Research area: Social Structure, Social Institutions and Processes; Pedagogy; Education.

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Формирование и диагностика компетенций будущих педагогов на основе кейс-метода

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Аннотация. Компетентностный формат федеральных государственных образовательных стандартов высшего образования предполагает не только новое проектирование результатов подготовки в виде системы универсальных, общепрофессиональных и профессиональных компетенций, но и внедрение активных и интерактивных технологий обучения и оценивания уровня их сформированности и развития на всех этапах освоения основной профессиональной образовательной программы в вузе. *Цель* исследования – обоснование возможности формирования и диагностики универсальных, общепрофессиональных и профессиональных компетенций студентов – будущих педагогов на основе кейс-метода. В качестве методологических оснований исследования определены компетентностный, деятельностный, системный и квалиметрический подходы. Методом групповых экспертных оценок определены структура и критерии оценки качества кейс-метода как средства формирования и диагностики интегративных результатов обучения будущих педагогов дошкольных организаций. В процессе исследования была обоснована структура кейс-метода в современном педагогическом вузе. Установлены экспертным методом критерии для оценки качества кейс-метода, позволяющие объективировать процедуры диагностики компетенций будущих педагогов: когнитивность, многофункциональность, профильность, латентность, интегративность. Материалы исследования могут быть полезны администрации и профессорско-преподавательскому составу вузов для формирования и диагностики универсальных, общепрофессиональных и профессиональных компетенций студентов – будущих педагогов дошкольных организаций, а также в рамках их индивидуальных образовательных траекторий.

Ключевые слова: кейс-метод, структура кейс-метода, критерии качества кейс-метода, компетенции, индивидуальная образовательная траектория, педагог дошкольного образования.

Научная специальность: 5.4.4. Социальная структура, социальные институты и процессы; 5.8.7. Методология и технология профессионального образования; 5.8.1. Методология и технология профессионального образования.

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Introduction

The most complex and acute pedagogical problems of professional training of students of pedagogical higher education institution and higher school in general include formation and diagnostics of universal, general professional and professional competences acquired in the process of training. Romantsev and his colleagues (Romantsev et al., 2011) emphasize that competences are not solely shaped through the mastery of curriculum content but also significantly influenced by the adoption of educational technologies. Consequently, these aspects should undergo a comprehensive assessment process. (Romantsev et al., 2011), which is formulated in pedagogical qualimetry.

In this case, assessment tools should measure the level of achievement of the established professional learning outcomes at all stages of students' t raining in the context of the implementation of the basic vocational education programme (BEP). In order to address these challenges, researchers are linking the development of new assessment tools that take into account the work functions and actions at the future workplace. One of such tools, according to the researchers, is case technology, aimed not only at diagnostics, but also at the formation of students' competences. It should be noted that in scientific and pedagogical literature case-technologies are called as educational technologies of training providing development of students' ability for goal-setting, independent passing through the process of development of professional tasks solution. It allows to individualize the educational process and to give it an active character in professional training.

G.M. Gadzhikurbanova, M.A. Nikitina (Gadzhikurbanova, 2015; Nikitina, 2014), and a number of other researchers have demonstrated the use of case study technology in the competence-based approach to teaching students' subject disciplines. In the works of G.A. Pichugina, C.F. Herreid, N.A. Schiller (Pichugina, 2020; Herreid & Schiller, 2012) and other researchers there is noted that case technology in the educational process contributes to the formation of competencies. The most common type of case technologies in educational practice is case analysis or case method. Sharing these positions, researchers note that the case method provides the following:

– The organization of the learning process consisting of actions of a certain order, i.e. it is algorithmic. These components imply strict scientific design and precise reproduction of actions that guarantee success (Hajikurbanova, 2015);

– It is implemented by considering practical situations that require the application of knowledge and skills from related and non-core disciplines and integrates competencies with personal qualities (Nikitina, 2014);

– It contains a resource for organizing students' independent work and controlling its results (Gadzhikurbanova, 2015);

– It provides a set of operations for constructing, forming and controlling knowledge, skills, abilities and attitudes in accordance with the set objectives (Pichugina, 2020).

It should be noted that in scientific and pedagogical literature devoted to case method content, researchers do not take into account the description of the structure and content and issues related to the quality of such assessment tools. To solve the tasks it is advisable to use expert methods, providing expertise in case method structure and content, as well as their quality assessment based on the criteria established by the expert method that will allow objectifying the diagnostic procedures of the universal, general professional and professional competences formed in the students. The effectiveness of expert methods makes it possible to introduce and obtain a quantitative solution and give an interpretation of the results obtained during the examination.

Purpose and objectives of the study

The purpose of this study is to substantiate the possibility of formation and diagnostics of universal, general professional and professional competencies of students – future teachers on the basis of case method on individual educational trajectories.

The main research questions that formed the basis of this article:

1) What is the structure and content of the case method for future educators to diagnose

a wide range of competencies presented in the Federal state standard of higher education?

2) How to determine the criteria for assessing the quality of the case method and how to determine them?

3) What is the validity of the developed cases for the purposes of diagnosing students' competencies?

The hypothesis of the research is that ensuring the objectivity and systematicity of the procedures of formation and diagnostics of future teachers level of competence formation is possible on the basis of the case method under the following conditions:

– If they take into account invariant and variable tasks of their future professional activity and the content of possible individual educational trajectories;

– If they have an integrative character, reflecting the fundamental component of the training content, covering the fundamental psychological and pedagogical knowledge of the future teacher, the skills of their synthetic application and transfer to professional activity, as well as a variable character – aimed mainly at the diagnosis of professional competencies, determined by the profile of training of the student;

– If they meet the quality criteria established by the expert method, which allow objectivizing the procedures of diagnosing the competencies of future teachers.

The practical research is limited to the consideration of the structure, content and quality criteria of the case method for students – future teachers of preschool organizations.

Literature review

According to the joint Order of the Ministry of Science and Higher Education and the Ministry of Education of the Russian Federation (Order of the Ministry of Science and Higher Education, 2020), a teacher training institution should implement a full-fledged practical training of students aimed at the formation and development of practical skills and competencies. The programme of studies should be based on the timetable and syllabus of the curriculum.

In this regard, practical training of students should be organized through practical classes and other learning activities, involving the implementation of selected elements of work related to future professional and pedagogical activities, in particular the use of the case method.

A special feature of the case method is that in educational practice students' solution connects knowledge and action. In addition, learners become more conscious and have a deeper understanding of the content of pedagogical activity in general and the meaning of problems in it (Dewey, 2024). According to T. D. Strelnikova (Strelnikova, 2009), the case method contains: objectives to teach the student individually and as a group to analyze information; to identify the most important problems in the presented situation; to generate alternative solutions and evaluate them; to find the optimal solution and to form action programmes. At the same time, the case method creates conditions for pedagogical activity of the learner to apply the knowledge and experience which is mastered in the process of higher education, therefore it is not only a means of assessment, but also a means of competence formation. Thus, Y. P. Surmin (Surmin, 2002) notes that the case at the same time is both a task and a source of information for awareness of options of effective actions and decisions.

Successful experience of case method design is presented in the work of G. M. Gadzhikurbanova (Gadzhikurbanova, 2015) in the formation of research competences of future teachers' students. Thus, the author highlighted the first stage, case design, which takes place in the following stages of consecutive actions: a) Exploratory stage: it determines the content of the discipline; clarifies the place of case in the system of taught case topic; describes the type of case and its structure; b) Constructive stage: it formulates pedagogical goals and identifies the problem situation; structures case content; determines conditions of situation development; selects analytical procedures and develops their implementation methodology; c) Technological stage: it involves sequential activities that include preparatory, introductory, analytical, organizational, communicative, reflective and summative work.

When designing cases in the second stage, the methodology of case study implementation in educational practice is developed. In the context of our study, the closest to its goals are the stages of case study writing proposed by M. Linders and J. Erskine. They include the following stages: 1) Finding the initial conditions, which is implemented in three stages: originating the idea of writing a case; finding the problem for the future case; finding an organization that agrees to provide material for the future case; 2) Making the first contact: this involves identifying the organization, gathering information and defining a list of questions of interest; 3) Gathering information: related to studying the psychological and educational literature, etc.; 4) Making the work algorithm: involves finding answers, getting data and information to the following questions "What is the content of the future case?", "In what form should the information in the case be presented?", "What is the structure of the future case?"; 5) Getting permission for publication, which is related to permission to use the case for educational purposes (Gadzhikurbanova, 2015).

In the aspect of our study the work of V. V. Yushkova (Yushkova, 2012) is very important. The work by V. V. Yushkova examines the qualimetric algorithm for developing qualimetric competence of trainees in technological education. For example, the qualimetric algorithm is designed for the author's course "Educational Quality Management" and reflects the structure of pedagogical expertise of pedagogical qualimetry. It is represented by the stages: preparatory stage, work of the working group, work of the expert group, work of the technical group and the final stage. This is due to the fact that the method of group expert evaluations is used, which allows to obtain a collective expert evaluation of the quality of qualimetric competence formation based on the case method. The author notes that the case method allows intensifying the interest in the subject and the process of implementing the assimilation of theoretical and practical material according to the individual plan. V. V. Yushkova demonstrates the classification of cases according to the following types of professional activity: 1) Educational-professional cases: they provide the formation of skills for organizing and managing the quality of the educational process, including the implementation and design of assessment activities; 2) Research cases: they provide the development of skills for organizing and conducting research work in professional activities, including students' activities; 3) Design cases: they take into account the formation of students' skills, assessment of pedagogical systems as a whole or its individual components, as well as design of bachelor training quality systems with regard to assessment of learning outcomes; 4) Organizational and technological cases: they provide the process of teaching students ways of managing the learning process, including the implementation of methodical, educational, research work using educational and methodical documentation (Yushkova,2012).

At the same time, G. M. Gadzhikurbanova (Gadzhikurbanova, 2015) research indicates that a systemic approach to their classification should be taken into account when developing cases. The author has identified the following system components: pedagogical aims and objectives, situation or case, conditions for the development of the situation, including its physical, social and temporal space, content and analytical procedures. As the author notes, important in the study is a group of case studies defining the following: Analytical process, conditioned by the research objective, namely descriptive process with a detailed description of the situation; Explanatory process, involving pedagogical theory to justify the situation; Heuristic process, involving testing of new pedagogical facts, clarification of the hypothesis, etc.; Search process, involving testing of pedagogical theories; Alternative process, involving emergence of alternative theories to explain the situation; Positional process, requiring the involvement of specialists to explain the situation; Project-based process, aiming to develop an action plan.

It should also be noted that in the American literature it is possible to find a classification of cases according to their function: 1) Practical case: includes exclusively real life situations, as illustrative and detailed as possi-

ble; 2) Learning case, in which the important task is to teach, reflecting typical situations encountered most often in life and with which a specialist has to face in professional activity; 3) Research case: provides the implementation of research activity, which is a model for obtaining new knowledge about the situation and behaviour in it (Maslakov & Semina, 2020).

Case developers G.M. Gadzhikurbanova, I.K. Maslakov and M.V. Semina, V.V. Yushkova, E. Mikhailova (Gadzhikurbanova, 2015; Maslakov & Semina, 2020; Yushkova,2012; Mikhailova, 2009), and others emphasize that each case study should have an individual, unique structure. In addition, the authors point out that each of them also has common characteristics. For example, E. Mikhailova (Mikhailova, 2009) identifies the following as common components: The temporal structure of the case, which provides a temporal sequence of the origin of the event; The narrative structure of the case, which contributes to playing out the drama in order to attract the attention of the user; The expository structure of the case, which helps the student to unambiguously understand the position of the case's author. The relevance of our study is indicated by the opinion of T.D. Strelnikova (Strelnikova, 2009), who believes that regardless of the type of case, its structure has three components: Plot component: description of the situation with information that provides understanding of how and under what conditions the event develops; Informative component: facilitates the assessment of the situation development; Methodological component: indicates the place of the case in the discipline with filling tasks.

Regarding the development for future pre-school teachers, the researchers focus on the application of the case method to develop self-organization and self-development skills. This is necessary to achieve the goals in professional activities for acquiring the necessary knowledge, skills on the work functions of the professional standard "Teacher". For example, M.S. Sidorina and E.V. Chukhacheva (Sidorina & Chukhacheva, 2017) used the potential of case method in the formation of students' professional competence in solving professionally oriented tasks. The students realized the solution of professionally oriented tasks in three stages: Analytical stage (analysis and assessment of the situation and formulation of the task); Modeling stage (planning and modeling ways of solving the task and developing a specific model of this solution); Executive stage (realization of the model and its practical implementation). The authors point out that in the process of solving professionally oriented tasks students systematize different areas and forms of professional activity, which require analyzing information, sorting information for the task set, identifying key problems, finding alternative ways of problem solving and their assessment, choosing the best solution to the problem and forming a programme of further actions.

Sharing these positions, P. Georgallis and K. Bruijn (Georgallis & Bruijn, 2022) point out that the use of the case method ensures that students learn to know as well as to act, i.e. to develop professional skills, which are crucial for them to understand how to deal with complex pedagogical situations in the world of practice. Many other researchers, such as S.L. Günther, S. Haryati, N. Radi Afsouran (Günther, 2019; Haryati et al., 2022; Radi Afsouran et al., 2018) agree with this. For example, S.L. Günther (Günther et al., 2019) believes that future educators need in-depth understanding of case-based training to develop knowledge about models and modeling as part of professional training content, as well as content-related diagnostic and instructional knowledge from a pedagogical knowledge perspective. In doing so, trainees' knowledge was assessed using open-ended tasks to assess competence and semi-open-ended tasks to assess both diagnostic and pedagogical knowledge.

In the work of D. Dorta-Afonso notes that the case method activates students and implements problem-based learning methods, emphasizing the benefits of practical training in a real-life situation and thus provides engagement in the content of mastering the basic professional educational program of higher education and, among other things, improves their learning outcomes. The author describes that with the help of the case method it is possible to keep students engaged in practical training, as

well as to maintain their motivation in learning (Dorta-Afonso, 2019). This is also pointed out by A. A. Shaikh, S. A. Shaikh, H. Karjaluoto, who emphasize that the use of the case method for classroom teaching takes into account the learning objectives to encourage active participation of learners in solving a real story, event or problem. In this regard, it is unresolved, provocative in nature and invites students to read, analyze and participate in the process of possible resolution (Shaikh et al., 2023). The effectiveness of the case method in higher education, which involves the development of autonomy in planning one's own educational process, is pointed out in the work of S. Heuer, M. Pilz (Heuer & Pilz, 2022).

However, the analysis of scientific and pedagogical studies devoted to the problem of case-method development and application in the educational process has shown that they do not provide coordination of educational goals of federal, regional and university levels with personal educational goals of students at different stages of their studies at university, and also there are no criteria for case quality assessment for current and boundary control of future teachers' competence formation, focused on teaching activities in preschool education. In this regard, we believe it is necessary to resolve these contradictions.

Methodology

The methodological basis of the study is the basic provisions of the systemic approach (Ananyev, 2014; Zagvyazinsky, 2016), activity approach (Leontiev, 2021; Slastenin, Isaev & Shiyanov, 2008), competence approach (Subetto, 2007; Zimnyaya, 2004) and qualimetric approach (Shikhova, 2006; Veretennikova, Shikhov & Shikhova, 2020; Veretennikova, Urazova & Shikhova, 2020). On this basis, the structure of the case study is built from the positions of systemic, activity and competence approaches. They envisage the interconnection of objectives, methods, learning content and diagnostics of learning outcomes.

From the perspective of systemic approach, the training of future teachers is considered as a flexible system, which takes into account theoretical and practical training in the case based on the curriculum and its content reflects the types and tasks of pedagogical activities of students in mastering the job functions: "Teaching", "Developmental activity", "Educational activity". Each work function in the individual educational trajectory is prescribed in the curriculum-based programme, taking into account the competences formed by the student.

From the point of view of the activity approach the case emphasizes the productive interaction of students, teachers and employers in practical training, which develops the ability to analyze the situation, plan the strategy and make decisions, develop the techniques of independent pedagogical problem solving.

From the point of view of the competence approach, it is possible to specify the objectives of the training of students – future teachers in the case in the form of holistic professional and pedagogical competence, which provides each individual the opportunity to study at the next levels of education or perform professional activities in a preschool organization.

The qualimetric approach involves not only the use of the method of group expert evaluations, which allows identifying the structure, content of the case study of students – future teachers in teacher education, but also carrying out the selection of criteria for the quality of the case study. Thus, professors from the Institute of Psychology and Education of Kazan (Volga Region) Federal University, as well as regional employers and graduates with more than five years of work experience in preschool organization were involved as experts (15 people in total).

Experts were offered to choose from the set of criteria proposed by the working group those that reflect the possibilities of the case method to assess the readiness of students for future professional and pedagogical activity in the system of preschool education. In accordance with the regulations of the expert method, at least 2/3 of the expert group should be in favor of including the criterion in their common system. Similarly, the validity of the developed cases was determined, the quality of which was revealed on the basis of the established system of criteria.

In the presented study, cases are considered as a means of evaluating the integrative results of professional training of future teachers of preschool organizations, taking into account the requirements of the federal and regional labor markets, academic community and educational interests of students themselves.

Results

In the course of this study it was revealed that the case method is a means of assessing the integrative outcomes of professional training. At the same time, the case is considered as a result reflecting the educational process of the curriculum, defining the list and sequence of academic disciplines (modules), practices and types of learning activities. In this regard, the case becomes the basis for the learner's mastering of the main professional educational programme in theoretical and practical training according to individual educational trajectories, which is presented in Fig. 1.

It should be noted that the main professional educational programme contains the main characteristics of higher education, namely the scope, content and planned results in the form of universal, general professional and professional competences. The case includes a problem, as well as all the necessary tools to solve it. The curriculum, which predetermines the content and structure of the case, deserves attention.

The invariant part is the source of the pedagogical situation, content and problem of the case. It covers the modular elements of the training curriculum reflected in the invariant part of the case study in Table 1.

Two key methodologies are embedded within this part, which are defined by analytical work and a systems approach. In this regard, psychological-pedagogical knowledge is necessary for the formation of scientific worldview of a student and scientific psychological-pedagogical basis of his/her professional and pedagogical activity in the system of preschool education. In particular, universal, general professional and professional competences are formed here, which are intended for the implementation of work functions in accordance with the professional standard "Pedagogue as an educator, teacher (pedagogical activity in pre-school, primary general, basic general, secondary general education).

At the same time, the variable part uses the content potential of the invariant part and is focused mainly on the profile of training of a future teacher, disclosed in the framework of individual educational trajectories of students.

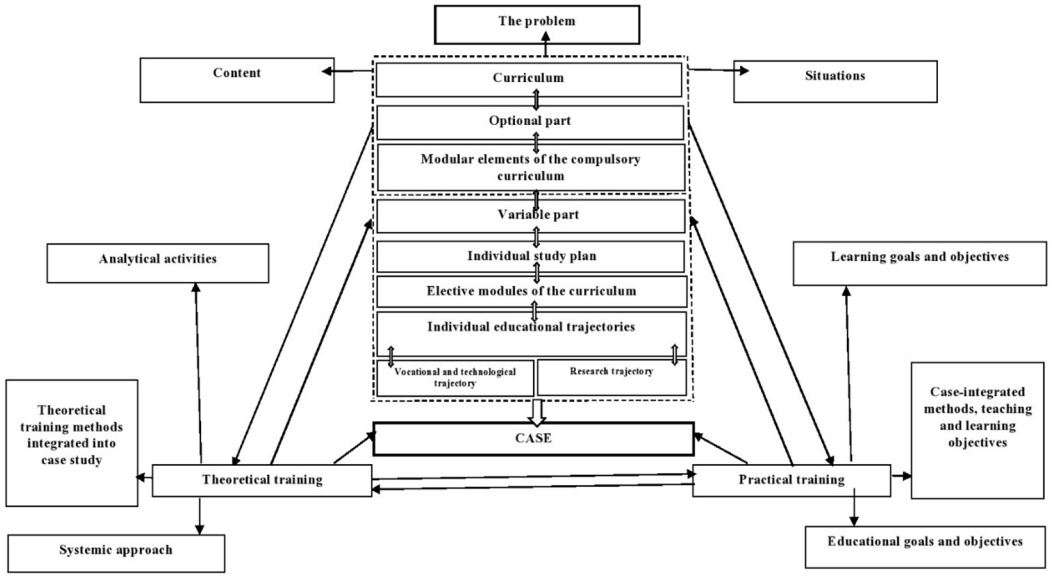

Fig. 1. Systemic factors determining the structure of a case

Table 1. Modular elements of the curriculum reflected in the invariant part of the case study (extract)

Code of the module	Name of the module	Cipher	Contents of the module /course	credit units	Developed competencies
M105	*Psychology and pedagogic module*	B 1.M.04.01	Basic Pedagogics	1	UC –1–10, GPC –1
		B 1.M.04.02	History of Pedagogics and Education	2	UC –1, GPC –4
M107	*Design and Technology module*	B 1.M.06.02	Project-based technologies in education	4	UC –2, GPC –2
		B 1.M.06.03	Research methods	5	UC –1, UC –2, GPC –8
M206	*Thematic module*	B 1.M.07.01	Introduction to Teaching activities	3	GPC –1, GPC –3
		B 1.M.07.02	Preschool Pedagogics	13	UC –3, UC –6, GPC –1

(UC – universal competencies, GPC – general professional competencies)

It is aimed, as a rule, at diagnosing the formation of professional competencies of students, in particular, the skills to perform labor functions defined by the professional standard of a preschool teacher.

In this case, variable part defining the goals and objectives of preschool education and training, integrated into the case study and methods of simulation, game methods and brainstorming. Within this part the content is oriented to the students' training profile and is disclosed within individual educational trajectories (Veretennikova, Urazova & Shikhova, 2020). The individual curriculum corresponding to each educational trajectory is formed from the set of compulsory, subject-specific and elective disciplines chosen by the student, taking into account the required amount of study hours. The variable part is aimed at forming and diagnosing professional competences of future teachers. The content of this part is determined by the graduate department of a pedagogical university and is formed by the participants of educational relations, presented in Table 2.

In this regard, it should be noted that this part deals with the tasks of teaching and education with children of early childhood and pre-school age, taking into account the peculiarities of their psycho-physiological development, individual characteristics and special educational needs.

The correlation between the invariant and variable parts of the curriculum is based on the classification of cases according to the degree of mastering theoretical and practical training. Here we can distinguish educational-professional cases, which reflect real pedagogical situations in work with preschool children; educational cases with the aim of teaching; research cases, focused on the implementation of research activities. When selecting a problem situation for the case it is important to understand its future teachers as a form of existence and expression of contradictions, which allows to involve them in the search for its contradictory sides, causes of occurrence and possible conditions for resolution. For the choice of a problem situation it is important to translate the educational and cognitive activity of students into professionally oriented in accordance with the requirements of federal standards of higher education and the "Teacher" professional standard.

The algorithm of case design and implementation of cases for developing and diagnosing competencies in the educational process, which is applicable to future teachers of preschool organizations, is provided by the student under the guidance of teachers (Table 3.).

Table 2. Modular elements of the curriculum reflected in the variable part of the case study (extract)

Code of the module	Name of the module	Cipher	Contents of the module /course	credit units	Developed competencies
M2O8	*Organization of educational process with children of early age*	*B 1. V.ED.04.01.01*	Early age Pedagogics	5	PC –1, PC –6
		B 1. V.ED.04.01.02	Organization of teacher's cooperation with parents of early age children	6	UC –3, PC –2
		B 1. V.ED.04.01.03	Methods of teaching early age children	7	PC –4, PC –5
	Organization of educational process in the context of inclusion	*B 1. V.ED.04.02.01*	Inclusive education for preschoolers with special needs	5	UC –8, PC –2, PC –6
		B 1. V.ED.04.02.02	Projecting of individual learning route for children with special needs	6	UC –2, PC –1, PC –2
	Organization of educational process with gifted	*B 1. V.ED.04.03.01*	Educational anthropology of gifted children	5	PC –2, PC –6
		B 1. V.ED.04.03.01	Projecting of individual learning route for gifted children	6	PC –2, PC –3
		B 1. V.ED.04.03.01	Methods of teaching gifted children	7	UC –3, PC –4, PC –5

(UC – universal competencies, PC – professional competencies)

A survey of first-year students at KFU showed that there is a demand for such individual educational trajectories as professional-technological and research.

Professional and technological trajectory chosen by 52 % of KFU first year students in 2024 provides formation of professional and pedagogical competence for formation of a systemic idea of professional activity for further employment in preschool organization.

The research trajectory chosen by 48 % of the students in 2024 is aimed at forming professional and pedagogical competence to continue their education in master's or postgraduate studies, preferring the research aspect of the future profession.

Table 4 shows an example of learning and professional case study for the first year students' boundary control. Curriculum 2024, according to which the practice in preschool organizations is provided only in the second semester (Curriculum on the direction of training 44.03.01 Pedagogical education (Preschool education) full-time engagement, 2024 // KFU. RU: [website]. 2024. URL: https://kpfu.ru/do/uchebnyj-process/uchebnye-plany). The implementation of such a case is designed for 2 months in the discipline "Introduction to Pedagogical Activity" in practical training on the basis of pre-school organizations in Kazan. The case also covers the content of the disciplines studied by students in the first semester: «Normative and legal bases of preschool education», « Introduction to pedagogy» etc.

Objectives of the case: 1. To analyze the main strategic directions of development of the modern preschool education system (Law «On Education in the Russian Federation», Concept of Children's Rights, FSES preschool, Concept of Preschool Education, Unified Federal Educational Programme of Preschool Education, etc.). 2. To learn the basics of formation of the educational programme of preschool organization in conditions of im-

Table 3. Algorithm of case design and implementation in the educational process

Content of the stages
I. Preparatory stage
1.1. Acceptance by the Principal, Head of Preschool Education Department of the decision to use the case study in the educational process. **1.1.1.** Assignment by the customer of an organizer (head of "Preschool education" chair (who organizes the timely practical training) the teachers of chair responsible for projecting and realization of case in educational process.
1.2. Case design: formulation of problem situations, aims and objectives of the case on the basis of comprehensive analysis carried out by the organizers, content of the curriculum (timetable of studies for each semester, schedule of educational process and working curriculum). **1.2.1.** Creation of a case by the organizers (teachers), including a methodology for its testing (implementation in the practical training of the pilot project department).
1.3. Creation of expert group (determination of: number of experts; competence of candidates for experts by methods: mutual recommendations; self-assessment, evaluation of argumentation; candidates with the highest coefficient of competence).
II. Stage – organizational
2.1. Formulation of learning objectives of the case in training, its main functions: the definition of the discipline (module), topic, the main content of practical training, for which the situation should be constructed. **2.1.1.** Formation of case objectives both individually according to individual educational trajectories and as a group Analyze information, identify problems of the proposed situation, choose the best solution and form an action program, generate alternative solutions and evaluate them **2.2.** Selecting the information needed to describe the situation: The content of the information depends directly on the problem, purpose, and objective of the case. **2.2.1.** Selecting methodological literature and developing guidelines for students. **2.2.2.** Determination of sources of information, methods of information collection and processing; analysis of psychological and pedagogical literature; conversations with teachers; assessment of situations. **2.3.** Identification of the situation, highlighting its problems; creation of its generalized model, search for an analogue of the generalized model of the situation in real professional life.
III. Expert stage
3.1. Discussion with experts of the materials developed by the working group, their modification and improvement. **3.1.2.** Familiarization of the experts with the purpose of examination, innovative methods of training, namely the case study. **3.1.3.** The experts are acquainted with the structure of professional and pedagogical competence, methods of its formation and expected result. **3.1.4.** Diagnostics of case-method quality assessment criteria for future preschool teachers. **3.1.5.** Discussion of the chosen situation, its individual points. **3.1.6.** Adjustment of the case. Discussion of the results of the assessment. **3.1.7.** Formation of recommendations for the final correction of the case.
IV. Final stage
4.1. Analysis and discussion by the customer, organizer and experts of the results of approbation of the case at KFU Institute of Psychology and Education at the Department of Preschool Education with students in the training direction 44.03.01 "Pedagogical Education" to identify the effectiveness of the case method for the formation of competencies in accordance with federal standards of higher education 3++

Table 4. Educational and professional case for first-year students

The Case	Formulated competencies
1. Invariant part	
Professional objective: Teaching and learning in education in accordance with the requirements of the FSES of preschool education	
Problem situation. The pre-school teacher regularly carries out tasks in his/her work concerning the issues of teaching and education of children. The basics of these processes are described in the normative documents regulating educational activities in the Russian Federation. Thus, for qualitative work the teacher must be competent in the content of the legal documents in his or her area of responsibility (the preschool education system), which include: the federal state educational standard for preschool education, legislation on the rights of the child, labour legislation of the Russian Federation, and so on. Knowledge would enable the educator to understand the specifics of preschool education and the special features of the work with children of preschool age, and would lay the foundation for an understanding of the importance of preschool education for the further successful development and education of each person, and the accessibility of quality education for each citizen. The quality of the education process is understood to be its conformity with the requirements of the federal state educational standard as the quality standard for the results of preschool education. The standard, as a legal and regulatory document, is designed to ensure that every child, regardless of national, territorial, property or other differences, can achieve the necessary and sufficient level for subsequent successful learning at the next level of the continuing education system.	
Case study questions and tasks 1. List what legal and regulatory documents a teacher needs to know about the educational activities in ECE centres. 2. Describe the mandatory requirements for preschool education, which are presented in the FSES preschool. 3. Describe the specifics of preschool education and the peculiarities of work with preschool children. 4. Describe the norm of quality of education in accordance with the targets at the stage of completion of preschool education in accordance with FSES preschool. 5. Describe the importance of preschool education for the preschool child.	EC-1. Able to search, critically analyze and synthesis information, apply a systematic approach to solve tasks. EC-4. Able to conduct business communication verbally and in writing in the state language of the Russian Federation and foreign languages. EPC-1. Able to carry out professional activities in accordance with normative legal acts in the field of education and norms of professional ethics.
The variable part	
Objective of the professional activity: Teaching and learning in education in accordance with the requirements of the professional standard "Educator"	
According to the professional standard, in a pre-school organization you will have to participate in the development of the main educational programme corresponding to the FSES preschool. Test your readiness for this work by carrying out relevant tasks	
Professional and technological trajectory	
2.1 Develop the content section of the preschool curriculum for «Speech Development» for young children in the context of the FSES.	PC-2 Able to design and organize the learning, education and socialization of young and preschool children, taking into account the social l PC-2
2.2 Develop a plan for your personal and professional development in a preschool organization after graduation. 2.2.1 Write a motivation letter (Why did I enter «Pedagogical education» of profile «Preschool education»). 2.2.2 Explain your pedagogical credo (main idea, mission of your pedagogical activity in preschool education). 2.2.3 Plan of personal-professional development (planned terms of implementation, planned forms of presentation of results, goal and objectives of personal-professional development). 2.2.4 List the personal qualities required to achieve the goals: those already formed and those to be developed.	EC-6. Able to manage own time, build and implement a self-development trajectory based on the principles of lifelong learning

plementation of FSES preschool. 3. To master the requirements for staffing in the conditions of implementation of the preschool education program in accordance with the professional standard «Educator».

The examination showed that it is reasonable to assess the quality of the case study according to the following criteria (Shikhova, 2006): multifunctionality, profile and latency, integrativeness and cognitiveness.

The criterion of multifunctionality (M) characterizes the suitability of case tasks for diagnosing the formation of general professional competences of students. This is possible due to the connection of the content of their invariant part with the main types and tasks of professional activity, typical for the given training direction. This criterion is calculated according to the formula:

$$M = \frac{m_c}{m_k},$$

where m_c – is the number of competences diagnosed by the case; m_k – is the number of competences of the given type in FSES of higher education.

The criterion of profile (P) allows assessing the relevance of the case content to the profile of the students' field of study. For this purpose, the proportion of "core" professionally relevant competences is calculated (for example, for the "Preschool education" profile the competences related to the specifics of preschool education and peculiarities of working with preschool children) diagnosed on the basis of the case, from the total number of professional competences established by the university:

$$P = \frac{\mathrm{P_p}}{\mathrm{P_o}},$$

where $\mathrm{P_p}$ – is the number of profile competences diagnosed by the case; R_o is the number of professional competences defined for the given training profile on the basis of the Professional Standard "Pedagogue (pedagogical activity in preschool, primary general, basic general, secondary general education) (educator, teacher)".

The latency criterion (L) reflects the ability of a case to identify levels of competence formation based on an accepted taxonomic model (Bloom, 1985). The term "latency" is introduced because these levels refer to latent parameters, but they are responsible for the case study results being recorded.

This criterion is calculated using the formula:

$$L = \frac{L_d}{L_m},$$

where L_{m} – is the number of levels of competence formation in the selected taxonomic model; L_{d} – is the number of levels of competence formation diagnosed by the case study.

The integrativity criterion (I) describes the completeness of the interdisciplinary links in a case and is calculated according to the formula:

$$I = \frac{I_z}{I_m},$$

where I_z – is the number of interdisciplinary links involved in the case study tasks; I_m – is the number of general and professional disciplines mastered or studied at the moment of control.

The cognitive criterion (K) reveals the suitability of cases for assessing the formation of certain types of knowledge in students according to the classification of V. S. Avanesov (Avanesov, 2005). This classifier is based on the principle of "increasing difficulty" of educational material and includes for checking the formation of both elementary knowledge and systemic, methodological, etc.

This criterion is calculated according to the formula:

$$K = \frac{K_d}{K_m},$$

where K_d – is the total number of types of knowledge in the adopted structure and content of the case study at the time of control; K_m – is the number of types of knowledge diagnosed with the case.

The overall assessment of the quality of the developed case, in terms of its suitability for diagnosing the whole range of general professional and professional competences of students, can be determined by the formula:

$$n = C_1M + C_2P + C_3L + C_4I + C_5$$

where C_1– C_5 – are weight coefficients (i.e. importance coefficients) of criteria 1–5, determined by expert method (in our case $C_1 = 0{,}25$; $C_2 = 0{,}25$; $C_3 = 0{,}25$; $C_4 = 0{,}25$; $C_5 = 0{,}25$, normalization condition is met:

$\sum_{i=1}^{5} C_i = 1$); n – is the complex case quality factor (maximum value of n= 1). The closer to unity the value of the complex criterion is, the higher the quality of the case is and the more suitable it is for the purpose of competence diagnosis.

Values of the considered criteria for the above case are presented in Table 5.

Table 5. Case method quality criteria values

№	Criterion	Value of the criterion
1	Multifunctionality (M)	0,62
2	Proficiency (P)	0,66
3	Latency (L)	0,75
4	Integrativity (I)	0,75
5	Cognitiveness (C)	0,78
6	Composite case quality factor (n)	0,70

The overall assessment of the case quality indicates its suitability for diagnosing the components of professional and pedagogical competence of students – future teachers of preschool organizations.

Discussion

In today's environment, when the discussion about the future of vocational education is on the agenda, it is appropriate to consider the need to significantly enhance the practical training of students. The meaning of this term is defined in the Law "On Education in the Russian Federation" (Order of the Ministry of Science and Higher Education, 2020). It is stated here that practical training implies, "…mastering of an educational programme under conditions of performing certain types of work related to future professional activity and aimed at formation, consolidation, development of practical skills and competence in the profile of training" (Order of the Ministry of Science and Higher Education, 2020).

Discussing the possible ways to improve the quality of practical training of preschool teachers, the researchers state that such issues as the following should be considered as unexplored and debatable:

– Increasing students' motivation for future pedagogical activity by strengthening interdisciplinary links and professional orientation of academic subjects;

– the need to form professional orientation of students' personality through better consideration of their educational needs, as well as possible difficulties that require targeted and timely assistance;

– the list coordination of professionally important competences of a graduate, their systematic formation ensuring his/her employment and competitiveness on the federal and regional labour markets.

In our opinion, the study of these issues will be facilitated by purposeful introduction of case method into the educational process, design, pedagogical expertise and experience of its use, which will provide ample opportunities for organizing interaction and cooperation of teachers from different departments in order to harmonize the ways of students' practical training, its individualization and quality improvement. Moreover, the approach to case method design and quality assessment offered in the article, providing for their pedagogical

expertise based on the presented criteria, allows diagnosing the whole range of students' competence formation and development, including the one within individual educational trajectories.

Conclusion

The analysis of researchers' materials studying case method resources allows us to conclude that the preparation of a future teacher to solve professional tasks of pedagogical activity will be more adequate to the demands of the state, society and an individual, if his/her training system will harmoniously combine the underlying psychological and pedagogical component and the profile component built with the interests of students, including within the individual educational trajectories. In this case, one of the main principles of designing the content of training assessment tools should be the principle of professional orientation.

In the context of this principle and competence approach, the systematizing factors that determine the structure of the case study discussed in the article, represented by the invariant and variable parts, have been developed. The invariant part includes tasks which require interdisciplinary links, synthesis of basic professionally important psychological and pedagogical knowledge, skills, universal and professional competences. The variable part involves not only in-depth profile training in pre-school education, but also its individualization through the introduction of individual educational trajectories. At the same time, the case method has proven itself as a tool for developing an individual educational trajectory as a system of self-development and self-determination in the future workplace.

In its turn, the selection of criteria for case quality assessment by qualified experts allows justifying their suitability for determining the level of students' competence formation and, thus, objectifying the control procedures.

The conclusions obtained as a result of the study supplement the existing theoretical ideas about the structure, content and methods of case quality assessment for students – future teachers of preschool organizations and can be used by university teachers when organizing multidimensional control over the learning process in the process of formation of students' competences.

Conflict of Interest

The authors declare no conflict of interest.

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