

Developing Individual Educational Paths for Future Teachers Based on the Requirements of the Updated Federal State Education Standards of Higher Education (FSSES of HE)

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Abstract

There is a need for individualization of professional education, which can ensure that the quality of training of graduates of pedagogical specialties meets the changing requirements of this activity. This requires the development of individual educational paths of future teachers, providing each student with his/her own ways to achieve common and individual educational goals, to develop those universal and professional competencies, demanded by modern society and the labor market. The research goal is to substantiate the concept and technology for developing individual educational paths of future teachers in higher education institutions based on the requirements of the updated Federal State Educational Standards. The study used pedagogical modelling, a study of regulatory legal acts in the field of education, benchmarking and expert methods.

This article substantiates the methodological foundations of the research, presenting competency-based and systemic approaches for the development of individual educational paths. It proposes a technology for developing these paths of future teachers based on the requirements of the updated Federal State Educational Standards. The content and design procedures are described, together with the criteria for the effectiveness of developing the paths based on the study of the best practices in those higher education institutions participating in the project of modernization of pedagogical education.

It provides recommendations for developing individual educational paths based on three aspects, substantial, activity and procedural. The recommendations will be useful for modernizing the content and procedures for the main professional educational programs of bachelor's and master's degrees, to ensure that these educational paths are correlated with the requirements of the regional labor market, and the updated Federal State Educational Standards in the training programs "Pedagogical Education", as well as students' individual needs and opportunities.

Keywords: individual educational paths, future teachers, Federal State Educational Standards, professional teacher standards

Проектирование индивидуальных образовательных траекторий будущих педагогов на основе требований актуализированных федеральных государственных образовательных стандартов высшего образования (ФГОС ВО)

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Аннотация

Актуальность исследуемой проблемы обусловлена необходимостью индивидуализации профессионального образования, которая может обеспечить соответствие качества профессиональной подготовки выпускников педагогических специальностей изменяющимся требованиям профессиональной деятельности. Проектирование индивидуальных образовательных траекторий будущих педагогов, предусматривающее, что каждый студент имеет собственные пути достижения общих и индивидуальных целей образования, развивает универсальные и профессиональные компетенции, которые востребованы современным обществом и рынком труда, является перспективным вектором развития профессионального образования будущего учителя. Повышение значимости вариативности профессионального образования будущих педагогов и необходимость предоставления обучающимся возможности реального выбора траектории профессионального развития требуют исследования потенциала актуализированных федеральных государственных образовательных стандартов высшего образования, относящихся к укрупненной группе специальностей (направлений подготовки) «Образование и педагогические науки» (далее ФГОС ВО). Оценка данного потенциала позволит комплексно реализовать новые подходы к структурированию содержания образования будущих учителей, его организации и технологическому обеспечению. **Цель** исследования заключается в обосновании концепции и технологии проектирования индивидуальных образовательных траекторий будущих педагогов в сфере высшего образования на основе требований актуализированных федеральных государственных образовательных стандартов. Ведущими **методами** исследования данной проблемы явились: педагогическое моделирование; изучение нормативных правовых актов в сфере образования; методы бенчмаркинга, предполагающие анализ, оценку и адаптацию лучших практик разработки индивидуальных образовательных траекторий будущих педагогов в сфере высшего образования, реализующих образовательные программы по направлению подготовки «Педагогическое образование»; экспертные методы, позволяющие сформулировать предложения по совершенствованию содержания и процедур проектирования индивидуальных образовательных траекторий обучения будущих учителей при освоении ими образовательных программ бакалавриата и магистратуры. **Выводы и рекомендации.** Проведенное исследование позволило разработать подходы к проектированию индивидуальных образовательных траекторий будущих педагогов на основе концепции, теоретическими основами которой стали системный и компетентностный подходы, а базовыми идеями – идея выбора, идея движения и «образовательного следа», идея педагогической поддержки и тьюторского сопровождения. Реализация данных подходов позволит эффективно решать задачи освоения будущими педагогами образовательной программы, исходя из их возможностей и потребностей, с учетом актуальных и перспективных требований к профессиональной деятельности. Предложенная технология проектирования индивидуальных образовательных траекторий будущих педагогов предполагает реализацию трех взаимосвязанных этапов – подготовительного, основного, завершающего. Она позволит обеспечить комплексную реализацию субъектами проектирования рефлексивной, поддерживающей и нормативной позиций, определяя специфику содержательного, процессуального и деятельностного аспектов данной деятельности на различных уровнях проектирования. Материалы

статьи представляют ценность для руководителей и разработчиков основных профессиональных образовательных программ высшего образования на основе требований актуализированных федеральных государственных образовательных стандартов; для тьюторов, участвующих в организации и сопровождении индивидуальных образовательных траекторий будущих педагогов; для научно-педагогических работников, обеспечивающих индивидуализацию содержания и технологий профессионального образования будущих педагогов; для работодателей, участвующих в проектировании индивидуальных образовательных траекторий и оценке качества их реализации. **Результаты исследования могут быть использованы** при разработке вузами основных профессиональных образовательных программ нового поколения, относящихся к укрупненной группе «Образование и педагогика», для обеспечения их соответственности с требованиями современного общества и рынка труда, а также с индивидуальными запросами и возможностями обучающихся.

Ключевые слова: проектирование, индивидуальные образовательные траектории будущих педагогов, актуализированные федеральные государственные образовательные стандарты, профессиональный стандарт педагога.

Introduction

There is a need for individualization of professional education, which can ensure that the quality of training of graduates of pedagogical specialties meets the changing requirements of this activity. Thus, a current priority for pedagogical education is the alignment of the professional training of future teacher with the new social and professional realities is (Bondarevskaya, 2013; Margolis, 2014; Yurlovskaya, 2016). This is reflected in the National Educational Doctrine, where individualization, as a focus on the diversity of educational programs, forms and methods of professional education, is defined to be the dominant development factor (Government of the Russian Federation, 2000). The Federal law on Education in the Russian Federation defines the possibility of studying according to an individual curriculum, including the development of accelerated learning within the framework of the educational program, and also specifies the need to individualize the educational content and the conditions for organizing training and upbringing of students with disabilities within the framework of an adapted educational program (Government of the Russian Federation, 2020).

The selection, construction and implementation of an individual educational path allow the student to develop precisely those universal and professional competencies which are demanded by modern society and the labor market (Khodyreva, 2011; Shaposhnikova, 2015; Zeer & Symanuk, 2014). The increasing significance of the variability of professional education of future teachers, the need to provide the students with opportunities for a real choice of a professional development path, requires the capabilities set out in the updated Federal State Educational Standards of Higher Education relating to the enlarged group of specialties (areas of training) "Education and Pedagogical Sciences (hereinafter referred to as FSES of HE) (Ministry of Education and Science of the Russian Federation, 2018a, 2018b, 2018c). An assessment of this potential will enable educators to substantiate the concept and technology of developing these individual educational paths based on the requirements of updated Federal State Educational Standards, and comprehensively implement new approaches to structuring the content of future teachers' education, its organization and technological support.

Purpose and objectives of the study

The purpose of the study is to substantiate the concept and technology for developing individual educational paths of future teachers in higher education institutions based on the requirements of the updated Federal State Educational Standards. The research addressed the following tasks relating to the development of individual educational paths of future teachers:

1. to substantiate the concept of developing the paths based on the requirements of the updated Federal State Educational Standards of Higher Education;
2. to offer a technology for developing the paths;
3. to set out recommendations for the substantive, activity and procedural aspects of developing the paths.

Literature review

Researchers have considered students' individual educational paths from the standpoint of variability of the organization and implementation of professional education, and from the standpoint of the unique content of the educational process, which allows the individual potential of the future specialist to be maximized. An individual education path is determined by the student together with the teacher, taking into account the student's motivation, abilities, emotional, psychological and physiological characteristics, as well as social, economic and time possibilities (Shaposhnikova, 2015). Grinko (2011) describes a student-centered organization of educational activity of students in higher education institution, designed to build the educational process in the context of realization of individual aspirations, developing life strategies, forming individual creative and professional development of the individual student. Gayazov (2020) sees a trajectory of the educational program, while for Shemanaeva (2017) it is a sequence of activities for each student to implement their own educational purposes. The authors agree with the description of multi-dimensionality of "individual educational paths", and see it as a selection by the students of the contents, forms and methods of professional development, correlated with the requirements and possibilities of social and professional environment, which are reflected in the basic education program.

Researchers agree that the development of an individual educational path, in which each student has his/her own ways to achieve common and individual goals of education, is a promising direction for creating a new generation of educational programs (Belyakova, 2018; Cai et al., 2017), and also represents the first and most general level of educational development (Akhtarieva, 2015; Zhdanko et al., 2014). An educational program is defined in the Federal Law on Education in the Russian Federation as a set of key educational characteristics (scope, contents, deliverables), organizational and pedagogical conditions and forms of certification, developed by the educational organization of higher education in accordance with FSES of HE, and based on the approximate basic educational programs (Government of the Russian Federation, 2020). If researchers consider the educational program as an initial set system, ensuring the achievement of the required learning results expressed in a set of competencies, then the individual learning path is characterized as a personal way to achieve the goals of professional education for specific students, corresponding to their abilities, motives, interests and needs. Thus, a significant number of different lines of an educational process – individual educational paths – can be implemented on the basis of the educational program.

From the perspectives of competence and system approaches, the development of individual educational paths of future teachers is considered by some scientists (Bagrij, 2017; Belyakova & Zakharova, 2020; Roi, 2016) as the activity of the educational process subjects in the development and implementation of a personal path to achieve the goals of professional education by particular students.

From this, psychological and pedagogical research defines the purpose and objectives of the activity, including:

- Ensuring successful adaptation of future teachers in the labor market;
- Implementation of individual preferences, interests, aspirations of students, development of their abilities and creative potential;

- Satisfaction of individual needs of the future teacher, including their individual educational needs;
- Formation of the subject position of the student, his/her readiness to form their own learning results, realized in the process of mastering the main professional educational program of higher education;
- Improving the quality of professional education through implementing variable content and alternative methods of education, depending on the student's individual characteristics.

Scientists agree that the developing of individual educational paths ensures the students' mastery of the educational program, based on their capabilities and needs, as well as taking into account the requirements of professional activity.

The researchers have identified conceptual ideas, the implementation of which will ensure the effectiveness of the progress and results of developing individual educational paths of future teachers, including the ideas of:

- choice, which involves introduction of personal meanings in the educational process, the formation of a teacher's "own educational order", his/her ability to see the prospects for his/her own personal and professional development (Drobotenko et al., 2019; Grinko, 2011);
- movement and "educational trace" as a spatio-temporal characteristic of an individual educational path, formed by fixing the activity and educational achievements of the teacher, including the implementation of a system of professional tests, which record individual experience, personal success and problems arising in the teacher's professional activities (Baiborodova et al., 2014);
- pedagogical and tutor support for the development of individual educational paths, which suggests that it is necessary to help teachers to decide on the content and individual ways of professional education, to realize their own goals and objectives for professional education, forming "semantic mechanisms of professional self-determination" (Belyakova, 2018).

Methodology

The research employed a number of methods including:

- Theoretical methods – a retrospective analysis, to identify the nature and characteristics of individual educational paths; a study of the legal documents – the analysis of normative legal acts in the sphere of higher education, including the updated Federal State Educational Standards of Higher Education in training programs 44.03.01 "Pedagogical Education (bachelor degree level), 44.03.05 "Pedagogical Education" (bachelor degree level), 44.04.01 "Pedagogical Education" (master degree level), based on which the regulatory framework analysis for developing individual educational paths of future teachers; pedagogical modeling – when creating concepts and technologies of developing individual educational paths at the main stages of professional education at the University, based on the requirements of the updated FSES of HE;
- The empirical methods included benchmarking, analysis, evaluation and adaptation of the best practices for developing individual educational paths, and implementing educational training program in "Pedagogical Education," and expert methods which made it possible to formulate proposals for improving the content and design procedures of paths for training teachers after their bachelor's and master's educational programs.

The research was conducted in three stages:

The first stage, established the methodological basis and defined the concept of developing individual educational paths of future teachers in higher education institutions.

The second stage proposed a technology for developing individual educational paths of future teachers, based on the analysis of the best practices of professional education, and the requirements of updated Federal State Educational Standards of Higher Education at the initial, main and final stages of professional education.

In the third stage, based on expert assessments, the project developed recommendations for developing the substantive, activity and procedural aspects of individual educational paths of future teachers.

Results

Data from 15 educational organizations, participating in the project of modernization of pedagogical education in the subsections “Education” and “Applicants” of the special section “Educational Institution Data” was analyzed (see Table 1).

Table 1: Implementation features of substantive, activity and procedural aspects of developing individual educational paths of future teachers in educational programs of higher education institutions participating in the project of modernization of pedagogical education

<i>Implementation features of substantive, activity and procedural aspects of developing individual educational paths of future teachers in educational programs</i>	<i>Percentage of educational programs having these features</i>
<i>Substantive aspect</i>	
Availability of selection of disciplines (modules) defined by the educational program in the part formed by the participants of educational relations	100.0
Availability of variable selection of disciplines (modules) defined by the educational program in the part formed by the participants of educational relations	16.7
<i>Procedural aspect</i>	
Capability implementation of individual pace of educational program mastery (accelerated training according to an individual curriculum)	26.7
Capability implementation of individual pace of educational program mastery (for the disabled and people with disabilities)	6.7
Availability of mastery of disciplines (modules) defined by the educational program in the part formed by the participants of educational relations in variable non-permanent groups	10.0
<i>Activity aspect</i>	
Availability of using e-learning and distance learning technologies, including when mastering a part of educational program in the form of online courses	40.0
Availability of adaptive educational technologies (including for the disabled and people with disabilities)	100.0
Availability of a network for implementing educational programs	6.7

The analysis of 30 educational programs posted on the present sites in training programs 44.03.01 “Pedagogical Education” (bachelor degree level), 44.03.05 “Pedagogical Education” (bachelor degree level), 44.04.01 “Pedagogical Education” (master degree level), found that the development of teachers’ individual educational paths is a component of the educational program development as a whole. The possibility for the participants to select their own modules was investigated and the analysis found that all of the educational programs provide the future teacher with such an opportunity. At the same time, it should be noted that there is no selection “guide”, since only 16.7%

of educational programs offered the possibility of variable selection (the ability to select more than two disciplines or the selection of several modules).

To assess the procedural aspect of individual paths development, individual curricula for these programs were studied. Only in 26.7% of the educational programs analyzed was it possible to provide students with the opportunity of mastering the program at an accelerated pace and in 6.7% of educational programs there was the possibility of increasing the training duration for students with disabilities. Content analysis of curricula showed that most have a structure, which does not fully provide the possibility of operational "construction" of the teacher's activities (including project activities) in variable temporary groups.

The descriptions of ongoing educational programs were examined for the activities they included. This showed that 40% included the possibilities of using e-learning and distance learning technologies, and all of them offered the possibility of using adaptive educational technologies, including people with disabilities, (unfortunately, only half of educational programs specify these technologies in terms of the specific disability). The concept of network implementation was found in only 6.7% of the programs, indicating that their capabilities are insufficient for developing teachers' individual educational paths.

The available best practices in universities show that the search for possible conditions for the development and implementation of individual educational paths of students is an important area of their activities, but the technology does not enable them to fully implement the regulatory capabilities and limitations of the updated Federal State Educational Standards of Higher Education and needs to be improved.

The technology of developing individual educational paths for teachers, based on the requirements of updated Standards is a step-by-step sequence of purposeful actions to develop and implement a personal path to achieve goals of professional education for a specific student.

The technology for developing individual educational paths for future teachers involves the implementation of three interrelated stages – preparatory, basic and final.

At the preparatory stage, the task is to determine the opportunities and limitations for the development of individual paths for teachers using the main development subjects. These are determined by the need to carry out joint activities on the development of individual educational paths with the teachers themselves, heads of the educational program, scientific and pedagogical workers involved in its implementation, potential employers - heads of educational organizations and educational management bodies. These are characterized by:

- The regulatory position of the educational program developers, taking into account capabilities and limitations of the development of individual educational path, ensuring implementation of requirements of the updated FSES of HE and the development of the students' readiness to solve issues of future professional activity;

- The reflexive position of the teacher as a subject of selection of substantive, procedural and activity characteristics of the educational program through mastery, mediated by the individual capabilities and student's needs, and the features of his/her educational and professional plans;

- Supporting the positions of higher school teachers, providing assistance in choosing students, based on their capabilities and needs, and the appropriate individual educational path.

The regulatory requirements for the development of individual educational paths of future teachers are set by a number of documents, including updated Federal State Educational Standards of Higher Education, the analysis of which enables the

determination of the content for the development, setting regulatory opportunities and restrictions for the implementation of the activity by the educational program developers.

In summary, the requirements of the updated FSES of HE of the bachelor's and master's programs in training programs "Pedagogical Education" generally maintain continuity in the development of individual educational paths with the previous version of the FSES of HE and include:

- the ability to use e-learning and distance learning technologies in the implementation of the educational program (p. 1.5 of the FSES of HE);
- the possibility of training according to an individual curriculum for people with disabilities, in an accelerated form (p. 1.8 of the FSES of HE);
- allocation within the framework of the bachelor's and master's programs of the mandatory part and the part formed by the participants of educational relations (p. 2.9 of the updated bachelor's FSES of HE and p. 2.7 of the updated master's FSES of HE) for disciplines (modules) and practices, ensuring that the development the formation of universal competencies is included in the mandatory part of the program and in the part formed by participants of educational relations. The disciplines (modules), providing the formation of general professional competencies, as well as professional competencies, established by the approximate basic educational program as mandatory, are included in the mandatory part of the program;
- providing disabled students with the opportunity to study, taking into account peculiarities of their psychophysical development, individual capabilities and, if necessary, providing the correction of developmental disorders and social adaptation (p. 2.10 of the updated bachelor's FSES of HE and p. 2.8. of the updated master's FSES of HE).

The main task consists of the integrated implementation by the development subjects of a reflective, supportive and normative positions, allowing them to determine jointly the specifics of the substantive, procedural and activity aspects of developing of individual educational paths of future teachers, both at the level of the educational program as a whole, and at the level of its components, and also at the level of a specific form of contact or independent work used in the course of educational program development.

The substantive aspect of the development ensures individualization of the education content of future teachers, with the possibility of selection of disciplines (modules), to set an individual educational path.

The procedural aspect of the development involves implementing the possibility of determining the individual pace of educational program development, mastery of components of the educational program individually or in variable non-permanent groups.

The activity aspect of the development determines the selection of variable pedagogical technologies, including adaptive methods for mastering the content of professional education; using e-learning resources and distance learning technologies; possibilities of network and other innovative forms of implementing educational programs, as well as a variety of ways of monitoring the results of professional education (including a system of professional tests, and the results of participation in research and project activities).

It should be noted that the present design aspects can be implemented at various development levels:

- individual educational learners' paths teachers at the level of the educational program as a whole;
- individual educational paths at the level of individual components of the educational program (disciplines (modules), practice, and state final examination);
- individual educational paths at the level of a specific form of contact or independent work used during the development of the educational program.

In the final stage, the task is determined by the need to assess the quality of development of individual educational paths based on the integrated implementation by design entities of reflective, supportive and normative aspects. This must take into account the regulatory capabilities and limitations established by the updated FSES of HE. Two groups of indicators provide the main criteria for the effectiveness of development of individual educational paths. The first group includes performance indicators related to the quality of professional education of the future teacher, the level of development of universal, general professional and professional competencies, thus ensuring the implementation of the main types of professional activities established by the Professional Standard of a General Education Teacher. The second group includes indicators which characterize the quality of the design process itself, including its functionality, flexibility, adaptability, efficiency and reliability.

To formulate proposals for improving the content and procedures for developing individual educational paths of future teachers when mastering higher education programs, a survey was carried out of 25 expert developers of educational programs in training programs 44.03.01 "Pedagogical Education" (bachelor degree level), 44.03.05 "Pedagogical Education" (bachelor degree level), 44.04.01 "Pedagogical Education" (master degree level). The experts were invited to formulate five recommendations on developing of individual educational paths of future teachers in substantive, activity and procedural aspects, taking into account the requirements of the updated FSES of HE. Table 2 presents the most chosen recommendations.

Table 2. Recommendations from experts for developing individual educational paths of future teachers in substantive, activity and procedural aspects

<i>Recommendations for developing individual educational paths of future teachers</i>	<i>Percentage of experts with this recommendation</i>
Using mostly modular structure of the educational program, allowing to "assemble" it to meet the needs and capabilities of the student	72
Possibility to select one module/discipline from several, which are equal in effort, or the selection of several modules/disciplines from the offered ones for a given effort	52
Providing opportunity to choose options for mastering of the discipline (module) by means of choosing a specific teacher or technology	76
Allocation of a significant part of the effort of the educational program in the framework of development of disciplines/ modules for students to implement the system of professional tests in accordance with their individual needs and requirements	92
Application of project-based learning for the development of a complex of universal and professional competencies among students within the modules of the educational program	100
The use of e-learning, distance learning technologies, including the use of open online courses	56
Possibility for students to implement in academic mobility, including in the framework of network interaction, followed by subsequent transfer of effort	80
Ensuring optimization of the resource when developing individual educational paths (number of students in groups; avoiding schedule conflicts, etc.)	72
Providing the possibility of training in variable temporary groups, formed for each module/discipline	48

As can be seen from the table, the recommendations relate to the individualization of the educational content, which sets an individual educational path, the individualization of forms and methods of mastering the educational content, including the possibility of using e-learning, distance learning technologies, and networked educational programs, and individualization of the development pace of the educational program. The expert survey also showed that the implementation of substantive, activity and procedural components of development of individual educational paths based on updated Federal State Educational Standards is associated with risks due to the unwillingness of project subjects to implement reflexive, supportive, and normative positions at various project levels.

The data provides the basis for the development of professional education competencies and for developing individual educational paths of future teachers. It shows a promising direction for the development of new generation of educational programs, providing each student with his/her own ways to achieve common and individual goals of professional education.

Discussions

The system framework and the competence approach to developing individual educational paths of students in general, as well as in pedagogical education comes from the theoretical basis of the proposed concept. The research has developed a methodology and technologies for developing individual educational paths of future teachers in respect of contact or independent work, as well as the individual components of the educational program. However, due to the introduction of the updated FSES of HE in training programs 44.03.01 "Pedagogical Education" (bachelor degree level), 44.03.05 "Pedagogical Education" (bachelor degree level), 44.04.01 "Pedagogical Education" (master degree level), it is necessary to explore the specific development of individual educational paths of future teachers at the level of the educational program as a whole, based on the regulatory opportunities and constraints and to implement the activities set out in the updated FSES of HE, taking into account variable position of professional education subjects.

Conclusion

The research allowed us to develop approaches to the development of individual educational paths of future teachers based on the concept of the system and competence approaches, and the basic ideas of choice, of movement and "educational trace," and of pedagogical and tutor support. Their implementation will effectively solve the problems of mastering the educational program by future teachers, based on their capabilities and needs, as well as taking into account current and future requirements for professional activity. The proposed technology for developing of individual educational paths of future teachers, involving implementation of three interrelated stages – preparatory, main and final - will enable a comprehensive implementation of reflexive, supportive and normative positions in order to determine jointly the specific substantive, procedural and activity aspects of this activity at various project levels.

The results are valuable for managers and developer teams of the main professional educational programs of higher education based on the requirements of updated Federal State Educational Standards, for tutors involved in the organization and maintenance of individual educational paths of future teachers, and for the research and teaching staff of educational organizations of higher education, providing individualization of the content and technologies of professional education of future teachers, as well as for employers

involved in the development of individual educational paths and in the quality assessment of their implementation.

The results also inform implementation by the universities of the main professional educational programs related to the enlarged group “Education and Pedagogy” of a new generation, to ensure they meet the requirements of modern society and the labor market, as well as individual requests and needs of students.

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