

Technological Development of Teacher-Training System Under the Conditions of the Transformation of Higher Education

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Abstract— The problem of the research is determined by the conditions of the transformation of higher education in the first decades of the XXI (in many post-Soviet countries (Russia, Ukraine, Belarus, etc.) century when following the transformation of the economy, society, culture, etc. in many countries, the traditional teacher-training systems are being destroyed, the quality of training is decreasing, undermining the prestige of the teaching profession and causing a drop in the quality of school education. In this regards, state and public management institutions tend to recognize the need to develop such technologies for the organization of teacher-training education that develop state-of-the-art mechanisms for increasing its effectiveness. The research, conducted in 2013-2017, involved 12 universities: Kazan Federal University (Russia), Moscow State University (Russia), Southern Federal University (Russia), Baltic Federal University (Russia), Pereyaslav-Khmelnitsky State Teacher-training University (Ukraine); Brest State University (Belarus), State Higher School named after Pope John Paul II (Byala Podlaska (Poland), Opole University (Poland); Oxford University (England), University of Glasgow (Scotland), University of Dublin (Ireland), University of Texas (USA).

Keywords: *technology, system, training of teachers, transformation of higher education, universities*

I. INTRODUCTION

Contemporary teacher education in universities is perceived ambiguously: in some universities this education accompanies the student’s major (mathematics, IT, engineering, medicine, law, etc.), in others it is included in the list of disciplines that determine the specialization of the course (pedagogical, psychological, socio-pedagogical, and

etc.). However, speaking about the problems of improving its effectiveness, it is often said that it is necessary to develop new mechanisms and technologies for educating teachers under the conditions of transforming higher education (Arsenyev, Shkodyrev, Yarotsky, 2012; Prokhorova, 2015; Sakharova, 2012; Lyubimova, Galimullina, Ibatullin, 2015; Menter, 2015; Gould, Holmes, Fantie, Luckenbaugh, Pine, Burgess, Manji, Zarate, 2008). Traditional technologies for teacher-training do not correspond to the new conditions (economic, information, communication, ethnocultural, migration, etc.) of the development of higher education, the development of society, the personality of the teacher and the personality of the student.

A. Literature Review

Research shows that researchers identify three interrelated mechanisms that require rapid development: 1) mechanisms for networking between educational organizations of various levels and specialization; 2) mechanisms for stimulating the innovative activity of researchers and teaching staff; 3) mechanisms for activating the research and development activities of under- and post-graduate students (Davydova, 2010; Prokhorova, 2015; Sakharova, 2012; Barnes, Mattson, 2017; Shaw, 2013; Weber, 2014; Root-Bernstein, 2015). At the same time, other mechanisms are widely discussed at international conferences and forums (Soderqvist, 2007; Valerian F. Gabdulchakov, Evgeniya O. Shishova, 2017; Gabdulchakov, Khairullin, 2018).

For example, the mechanisms of economic incentives, internationalization of higher education, etc., are considered to be the most important for improving the effectiveness of

teacher education. The mechanisms of economic incentives in higher educational institutions offering psychological and pedagogical majors can come in the form of the fees for high results in the rating indicators: publications indexed in Scopus and WoS; stimulation of advancement in research and career development of students (pedagogical college, bachelor's degree, master's degree, postgraduate study).

Mechanisms of internationalization of the universities are to be discussed separately. Internationalization of a university is understood as the process of transforming a regional (or federal) institution into an international one, which leads to the inclusion of an international aspect in all components of the integrated management of the university in order to improve the quality of teaching, research, and the acquisition of the required competences (Soderqvist, 2007).

To develop the worthy teacher education in Russian universities, it is necessary to improve the mechanisms aimed at taking into account the multicultural features of the country, the organizational and pedagogical conditions of working with the local school populations, and a variety of models of psychological and pedagogical education that are determined by these conditions.

Solving the problems of multicultural education cannot be limited to general issues of national culture, literature (tales, myths, legends, plots, motifs, morals of different peoples), it is necessary to actively use the resources of the language - the resources of linguodidactics and the associated phenomena of linguistic interference: positive and negative language transfer (Gabdulkhakov, Khisamova, 2012; Birman, 1994; Menter, 2014; Khairullin, Bimakhanov, Murzabekov, 2017).

It is this linguodidactic approach that became the conceptual basis for multicultural teacher-training at the Kazan Federal University. This approach is based on taking into account the language preferences of students and the construction of special linguodidactical technologies aimed at the building future teacher's linguistic and later multicultural competences.

While implementing the new educational modules, in collaboration with D. Birman and I. Menter, researchers from the US and Great Britain, it was established that in Russia it is better to develop a polycultural rather than multicultural education system.

Multicultural education, despite the wooded pronouncements on the right of every people for their language and culture, contextually still suppresses the native language of immigrants, assimilates people to the cultural values of the host country. Multicultural education, traditional for the USSR and the Russian Federation, always assumed and assumes the equality of languages and cultures of all peoples.

In the classical universities of Russia there are two main technologies for teacher education: 1) Education as a major at the level of either Bachelor or Master degree course; 2) Education as an additional (Kasprzhak, 2016, Margolis, 2014). In this regard, many researchers (Berezhnaya, 2014, Liu Nan, 2016) note that pedagogical universities must be gradually transformed either into large basic centers for the training of teachers, or to the faculties of classical universities.

Kazan Federal University (KFU) implements programs of all levels of pedagogical education: Bachelor, Master degree courses, postgraduate programs as well as programs for additional professional education. In KFU there is a system of continuous teacher education and teacher development throughout his professional life (Kalimullin, 2014).

The coordinator of psychological and pedagogical training in the corresponding institutes of KFU is the Institute of Psychology and Education (the former department of psychological and pedagogical education).

At present, the integrative technology of training is being introduced in the KFU, when, on the basis of flexible curricula, the university provides the opportunity for bachelors of classical training courses (physics, chemistry, biology, etc.) to specialize in Education after the first or second year of the Bachelor degree course.

Another technology of acquiring the teaching profession, which is gaining popularity among students, is a comprehensive one, involving various programs of professional retraining, which was widely supported by participants of the Second International Forum on Teacher Education, organized by the Institute of Psychology and Education of the KFU in 2016 (The II International Forum on Teacher Education Agenda, 2016).

Thus, literature review and the current practice show that at present, technological development of teacher-training system at university is viewed from different angles. There is a need for an objective analysis of these approaches, systematization of the identified problems in a special matrix.

B. Problem Statement

The problem of creating a functional mechanism that allows to quickly update not only the curriculum content, but also educational technologies, has become increasingly relevant in recent years. The quality of education, the quality of training, and the ranking of universities depend on the timely updating of technologies.

II. MATERIALS AND METHODS OF RESEARCH

The methodological foundation of the research is Menter's concept of interdependence of pedagogical competences and learning outcomes. Ian Menter studies relation and interdependence between competences and educational outcomes, and also emphasises the technological nature of their relation (Menter, 2014). The study used methods such as questionnaires, analysis and comparison, the method of induction and deduction, methods of generalization. The methodological basis of the study was the method of AI Prigozhin (Prigozhin, 1995). By this method we have compiled a list of the problems of the technological organization of teacher education. The experts (Russian and foreign specialists who organized the teacher education) had to delete from it those that they seem to be insignificant or repetitive, then combine the problems, when necessary, from the obtained transformed list the most important ones. After filling in the "blanks" using the method of paired comparisons,

the main problems of the technological organization of teacher education were determined.

III. RESULT

The results of the study were obtained applying the following technique. First, we included in the "heading" and in the "footnote on the right" the numbers of the problem recognized as the most important, then we matched each problem of the horizontal row with each vertical one (by the criterion of mutual influence). In other words, comparing each pair of problems, we answered the questions: which of the two intensifies or causes the other? Solution of which of the problems will make it easier to solve the others?

If the problem from the vertical row causes, aggravates the problem from the horizontal, then in the box when the cross we put the arrow horizontally from left to right and upwards. If the relationship is reversed, then the arrow is placed on the contrary. In the case where there is no connection between the two problems, we set zero (0). If any problems on the list have disappeared, we have appended them, without introducing them into a "special blank box".

The processing of the received material by experts and consultants allowed the construction of graphs reflecting the representation of each of them about the most important problems of the technological organization of teacher education in a particular university.

As the result of processing "special blank graphs" filled in by each of the experts, four types of challenges emerged: 1) root - causing or intensifying other challenges; 2) nodal - dependent on some challenges, but simultaneously causing or intensifying others; 3) resulting - resulting from other problems; 4) autonomous - quite significant, but not related to others.

The research, conducted in 2013-2017, involved 12 universities: Kazan Federal University (Russia), Moscow State University (Russia), Southern Federal University (Russia), Baltic Federal University (Russia), Pereyaslav-Khmelnytsky State Teacher-training University (Ukraine); Brest State University (Belarus), State Higher School named after Pope John Paul II (Byala Podlaska (Poland), Opole University (Poland); Oxford University (England), University of Glasgow (Scotland), University of Dublin (Ireland), University of Texas (USA). (see Table I).

The sign "+" marks those problems, which for 2013-2017 appeared to be most pronounced, the sign "-" - those problems that exist, but cannot be designated as root, nodal, resultant, or autonomous.

The sign "+" means a more positive trend in solving the problem, the sign "-" means the predominance of the negative trend in resolving the problem.

In accordance with the numbering on this matrix, the universities are allocated:

- Russian Federation: 1 - Kazan Federal University, 2 - Moscow State University, 3 - Southern Federal University, 4 - Baltic Federal University;

- Eastern Europe: 5 - Pereyaslav-Khmelnytsky State Teacher-training University, Ukraine; 6 - Brest State University, Belarus, 7 - State Higher School named after Pope John Paul II, Byala Podlaska, Poland, 8 - Opole University, Opole, Poland;
- Western Europe: 9 - Oxford University, England, 10 - University of Glasgow, Scotland, 11 - University of Dublin, Ireland,
- North America: 12 - University of Texas, El Paso, USA.

As we see from the matrix (see Table 1.), the university partnership model with educational institutions - different links in the system of continuous teacher education - is of particular concern: at the universities of Western Europe and Moscow State University it is not as high as in Kazan and Southern Federal Universities.

But the availability of invariant components (university lyceums, gymnasiums, centers, etc.) in various parts of the continuous teacher education has always been quite high.

The inadequacy of the mechanisms (algorithms, technologies) for the implementation of continuity between comprehensive school (gymnasium, lyceum) and the classical university proved to be characteristic of the Russian universities: this problem at the level of standards and programs in Russia is declared as a nodal one, and at the level of educational practice it is still not solved or requires more attention.

Development (lack) of regulatory and legal framework justification of technologies for transforming the social status of the future teacher as a teacher of the XXI century (mobile, communicative, reflexive, broad-minded, creative) is declared in all countries - in Russia and in Eastern and Western Europe, in these areas while weak. These problems are related to the problems of the resulting type.

Strong progress in all universities (both in the West and in Russia) is observed in creating the necessary conditions for the organization of in-service training of the university teaching staff, student groups in the modern information and game-oriented environment.

The inadequacy of polycultural (multicultural) content to train teachers for working with migrants or with a diverse ethnic/ national school populations is more typical for Russian universities: in recent years they have focused on the standards of Western Europe (where the number of migrants is growing) and began to lose their traditional links with local (national and regional) educational institutions (and their specific linguistic and national-cultural needs). Universities of Western Europe, pursuing a policy of multiculturalism based on English as a universal agent language for all countries, have strengthened their influence on universities around the world.

In terms of using distance education resources (the availability of online resources, a certain number of users of online resources), universities in Western Europe are traditionally strong: online courses in English can be used anywhere in the world. Online courses in the Russian

TABLE I. MOST IMPORTANT CHALLENGES OF THE TECHNOLOGICAL ORGANIZATION OF TEACHER EDUCATION AT UNIVERSITY MATRIX

Type of challenges	Typical problems	Russia				Eastern Europe				Western Europe			USA	Band
		1				2				3			4	
		1	2	3	4	5	6	7	8	9	10	11	12	
Root	Partnership model of university and other educational institutions - different links in the system of continuous teacher education.	+	-	+	-	-	+	-	+	-	-	-	+	4 (+) 7 (-)
	Availability (lack) of invariant components (university lyceums, centers, etc.) in various links of continuous teacher education.	+	-	+	-	-	+	-	+	+	+	+	+	8 (+) 4 (-)
	Availability (lack) of the system of interaction with employers, mechanisms for studying the labor market and demand for educational services.	-	-	-	-	-	-	-	-	-	-	-	+	1 (+) 11 (-)
Nodal	Availability (lack) of mechanisms (algorithms, technologies) of economic stimulation of research activity of teaching staff and students.	+	-	-	+	-	+	-	+	+	+	+	+	8 (+) 4 (-)
	Provision for (lack) of continuity in the unity and consistency of the stages of education and upbringing of future teachers in the framework of the classical university.	-	-	-	+	-	-	+	+	+	+	+	-	6 (+) 6 (-)
	Internationalization of education, the opportunities for the training foreign students, the development of academic programs in English, network, distance and other forms of training at the international level.	+	+	-	-	-	+	+	+	+	+	+	+	9 (+) 3 (-)
Resulting	Development (lack) of regulatory and legal framework justification of technologies for transforming the social status of the future teacher as a teacher of the XXI century (mobile, communicative, reflexive, broad-minded, creative)	-	-	-	+	-	+	+	+	+	+	+	-	7 (+) 5 (-)
	Availability (lack) of provision for the organization and maintaining the system of life-long learning of the university teaching staff and student groups in the modern information and game-oriented environment.	-	-	-	-	-	+	+	+	+	+	+	+	7 (+) 5 (-)
	Availability (lack) of provision for the development of mobility the provision for the academic mobility of the faculty the students.	-	-	-	-	-	-	-	+	+	+	+	+	5 (+) 7 (-)
auto-nomous	Availability (lack) of polycultural (multicultural) content for training teachers to work with migrants (or with diverse school populations).	-	-	-	+	+	+	-	+	+	+	+	+	8 (+) 4 (-)
	Use of distance education resources (online resources), increasing the number of users of university online resources.	-	-	-	+	+	+	+	+	+	+	+	+	9 (+) 3 (-)
	Developing information provisions for educational process with modern information and communication tools.	+	+	-	-	-	-	-	-	+	+	+	+	6 (+) 6 (-)

language are only gaining popularity. Information provision of the educational process with modern information and communication tools in Eastern Europe is inferior to the situation in Western Europe and the United States.

Thus, the technological development of teacher education in universities should be aimed at meeting the following challenges:

- root challenges: the development of university partnership model with educational organizations - different links in the system of continuous teacher

education; the formation of integrated components (university lyceums, centers, etc.) in various links of continuous teacher education, the formation of a system of interaction with employers, studying the labour market and the demand for educational services;

- nodal challenges: the development of mechanisms (algorithms, technologies) for the economic stimulation of the research activity of teachers and students; the implementation of continuity at the junction of the comprehensive school (gymnasium, lyceum) and the classical university; the development of continuity in the unity and consistency of the stages of education and upbringing, the development of the internationalization of education, the opportunities for the training foreign students, the development of academic programs in English, network, distance and other forms of training at the international level;
- resulting challenges: development of regulatory and legal framework, justification of technologies for transforming the social status of the future teacher as a teacher of the XXI century (mobile, communicative, reflexive, broad-minded, creative); the provision for the organization and maintaining the system of life-long learning of the university teaching staff and student groups in the modern information and game-oriented environment, the provision for the academic mobility of the faculty and the students;
- autonomous: generating multicultural content for training teachers to work with migrants (or with a mixed /ethnic school populations); developing distance education system (online resources), increasing the number of users of university online resources, developing information provisions for educational process with modern information and communication tools.

IV. CONCLUSION

The design and implementation of technologies for the organization of teacher education made it possible to identify a complex of challenges requiring special attention in classical universities. These include: an underestimation by the scientific community of the classical university of the role and importance of teacher education; undeveloped diagnostic tools for the organization of competent selection of applicants for pedagogical professions, etc.; the priority of education research in the field of problems of history and the theory of pedagogy, with a consistent decline in the research interest in topics that are in demand in school and university practice; absence of conceptual bases of the organization of the Arts and Science education not only in the university, but also in the secondary school; inadequacy (in accordance with the accepted standards of psychological, pedagogical, didactic bases) of preschool, primary, secondary, higher, postgraduate education.

To solve these problems, the experimental programs for professional retraining of undergraduate students (those majoring in Mathematics, Physics, Biology, etc.) for a subject

teacher (teacher of Mathematics, Physics, Biology, etc.) were successfully launched at Kazan Federal University.

The matrix of the problems of the technological organization of psychological and teacher education in classical universities shows that among the typical shortcomings there are issues of methodological, organizational, structural character; moreover, up to now universities face the challenges of all types - root, nodal, resultant, autonomous. To a greater or lesser extent they are characteristic for universities in both Russia and Western Europe.

V. RECOMMENDATIONS

Under the conditions of transformation of higher education, it is necessary to pay attention to the methods and forms of economic stimulation of the development of teacher education, in which the objective and subjective components are singled out.

If the objective component includes a set of intangible, material and natural resources involved and not involved in the teaching practice and having a real opportunity to participate in it, the subjective component is the staff (faculty), its professional knowledge and skills; values and motivation; working capacity, mental and physical health; as well as the ability to communicate, interact and manage.

The latter is one of the most valuable resources - the managerial potential of the institute of teacher education in the framework of a classical university.

All this brings to the fore the problem of an effective assessment of the available managerial potential and its development.

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