

# STUDY OF BACHELORS' DEMAND AS ONE OF THE CONDITIONS OF CREATION OF MASTER'S PROGRAMS IN THE FIELD OF TEACHING AND LEARNING

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## Abstract

What is becoming important towards the integration of education in the world is the improvement of Master's programs in Teaching and Learning in accordance with the changing needs of graduates and employers. The objectives and content of graduate programs are specific in different countries. They are defined by the system of modern requirements to graduates as well as and traditional approaches to training of specialists with higher education. In some countries these are Master's programs which solve the problem of shortage of teachers at schools whereas in others the purpose of Master's programs is to improve the quality of vocational training of teachers who have completed Bachelor's degree. The formation of a two-tier system of higher education in the field of teaching and learning in Russia highlights the problem of specifics of Bachelor's and Master's training and simultaneously their successive combinations. The legislation of the Russian Federation provides an opportunity for bachelors to continue training in Masters in Teaching and Learning (MTL) or offers bachelors of other areas of training to study there.

The first experience of MTL in Russia has shown that the highest demand is among graduate students without Bachelor's education in Teaching and Learning (BTL). This is because the graduates of BTL do not understand the goal of getting the second teaching education. Having Bachelor's diploma, they have the right to teach at secondary and high school. However, they have expressed the wish for the necessity of Master's programs that implement their needs for professional development (improving their Bachelor's preparation or providing additional opportunities in teaching and learning). The objectives of the research is, after studying the world experience, to analyze the goals and needs of bachelors in the field of teaching and learning to improve existing and create new in-demand Master's degree programs. The study involved 109 students of BTL at Kazan Federal University, having the following specializations: "Mathematics and Informatics", "Mathematics and English". The survey of the students has shown that their preferences are connected with the deepening of training in the selected profile. The weak students choose additional areas that give the second speciality. The most attractive area for students is "Mathematical education in the system of specific training". The design of the educational program in this area is important because of the need to prepare teachers for teaching in physics and mathematics lyceums as well as specialized mathematical classes. Constant study of bachelors' demand in the Master's training will take into account their views when improving existing and designing new Master's programs in teaching and learning.

Keywords: higher pedagogical education, Master's program, Masters in Teaching and Learning, Bachelor's degree, students' demand, teachers' preparation.

## 1 INTRODUCTION

Currently in Russia there is a formation of a two-tier system of higher education in the field of teaching and learning. The first developed bachelor's and master's programs have been tested and the first conclusions on their effectiveness have been made. When designing new bachelor's and master's programs the issues of quality assurance of professional preparation of future teachers are brought to the forefront. Like all over the world, Russia still has open questions of differences between bachelor's and master's programs and their functional significance for future professional activity of graduates and, consequently, for an employer. Of great importance is the solution of the tasks of competence-based goal-setting that is specific for educational programs of each level.

The most unusual question for Russian universities was the establishment of MTL programs. In most cases they are created as educational programs that enhance individual areas of BTL. But at this stage there are no restrictions for bachelors with non-pedagogic speciality to matriculate to master's programs. So, an engineer with a bachelor's degree who has no idea of pedagogy, psychology, methods of teaching could come to MTL. In this case there are differences in the degree of

preparedness of students to perceive complex training courses, which professionally deepen bachelor training. This question is being solved differently all around Europe. Having evaluated the system of support of career development in other Western European countries, experts from Latvia have decided that "the most appropriate is the creation of master's training programs on the basis of higher education" [1]. From a pragmatic point of view "the US has again returned to the concept of magistracy for training teachers partly with the aim of retraining specialists who have degrees in areas not related to teaching activities, or those employees who retire early" [2]. The solution of this question in our country will influence the design of master's programs and the level of graduates. What is also important is to study needs and preferences of future master graduates who are bachelors now. So, the Budapest-Vienna Declaration on European Higher Education Area (2010) says: "We urge all concerned parties to create an enabling working and learning environment and foster student-centered learning as one of the ways to empower students of all forms of education, providing them with sustainable and flexible trajectory of life" [3].

## 2 BACKGROUND

In accordance with the principles of the Bologna process, European education in the field of teaching and learning has undergone significant changes, given the requirements for greater compatibility and comparability. Thus in Ireland, for example, there are still significant gaps in the existing policy of teacher education, particularly in relation to continuous professional development of future teachers [4]. In Israel, a master's degree is a preparatory stage for doctoral studies. However, in accordance with the modern trends, graduate programs cease to perform only preparatory function [5].

Organization of teacher training was carefully reformed in France in 2010. This reorganization is the result of three interrelated reforms: requirement of a master's degree for all teachers, new recruitment of teachers and integration of teacher training colleges with universities. Universities are now responsible for providing initial training in programs leading to a master's degree [6]. Since 2005 educational institutions in France have been integrated into universities, and all teachers must have a master's degree. French scientific literature notes that the accession to the Bologna process designed to improve the quality of teacher education and the status of the teaching profession, in fact, turned into budget constraints in education and reducing time of internship of future teachers [7]. Traditional programs of teacher training contain a lot of unrelated courses. Creating stronger and more effective programs of teacher education requires coherence and integration between courses, course work at university and pedagogical work at schools that tie theory and practice and serve as an effective design and modeling of different learning styles and good teaching [8]. Hands & Rong (2014) in their empirical study described the experience of training teachers in the United States by weaving coursework at University and practice at school during a 5-year integrated bachelor's and master's programs [9].

Analyzing significant problems of teacher preparation in the twenty-first century, it is noted that teachers need to have global civic education, have knowledge and skills necessary for critical evaluation of phenomena in a rapidly changing world. Howe's work (2013) discusses the example of a unique program of teacher education at a Japanese University, based on a well-established Canadian program, offering several learning paths [10].

One of the goals of the Bologna process is restructuring European University programs from the monolithic five-year programs into two cycles, bachelors and masters. A survey of students at Charles University in Prague showed that every third student prefers the old five-year program, arguing that the two-stage system is not suitable for teacher training, because courses are not sufficiently linked to teaching at school, and graduates of this bachelor's degree cannot find work at schools [11]. Palomino (2015) analyses the perception by future secondary school teachers of teaching methodologies used in studying the preparation of teachers [12]. It has been proven that a constructivist and learner-oriented system of training is more advantageous than a traditional training-oriented model. There have been studied the motivational factors that influence the choice of licensed master's programs of training of future teachers: the opportunity to share their love of learning and to change the situation in society, the need for career change or the expected benefits of teaching career [13].

Results of the research on the demand for initial programs of teacher education carried out in Portugal and Sweden have shown the level of motivation and expectations of students regarding teaching profession. The comparison between countries in combination with suggestions and recommendations of teachers shows that the recruitment process can be maintained, if information about the structure, content and objectives of programs of teacher education is clarified and explicit to students [14].

Introduction of master's degree in teaching and learning has become an important milestone in teacher's professional development. A distinctive approach to improving classroom practice requires that schools and universities work in partnership [15]. Innovative collaborative approach to development and implementation of this new qualification was developed and introduced in England in 2010. Master's level of teaching profession was designed to improve teachers' skills, however the results of the study showed that this approach did not have a significant effect on the nature of teachers' professional development. In a master's degree in teaching and learning (Masters in Teaching and Learning (MTL)) professional development is continuous with meticulous attention to identifying the needs of teachers in close support of colleagues, because novice teachers are trained by instructors at school (an 'in-school coach') [16].

### 3 CONTENT, STRUCTURE AND BODY OF RESEARCH

The results of entrance examinations in MTL at Institute of Mathematics and Mechanics (IMM) of Kazan Federal University (KFU) have shown that master's programs are most in demand among students without bachelor's pedagogical education. They are less popular among BTL graduates, who do not understand the purpose of getting the second teacher education. Interviews with future teachers of mathematics and informatics showed that there is a need for further professional development. This explains the necessity of designing master's programs for professional improvement, based on the study of different areas of MTL in Russia and other countries. The objective of the research is to study the world experience, to analyze the goals and needs of bachelors in the field of teaching and learning in order to improve existing and create new high demand master's programs.

To solve the first problem of the study there have been analyzed the existing forms of training in a magistracy. We identified five forms of graduate programs: full-time (day-time – 2 years); part-time (evening-time on weekdays – 2 years); part-time (visiting classes once a week on weekends – 2 years 5 months); part-time classical (sessions two times a year – 3 years); remote (online).

The next question of the study was to determine the areas of master's studies. Global experience has shown the existence of two directions of master's degree programs: programs which deepen bachelor training (they will be called "deepening") and programs which provide additional speciality ("additional"). There has been compiled a list of additional (8 directions) and deepening (8 directions) master's programs: mathematics ("Theory of Numbers", "Geometry", "Mathematical Analysis", "History of Mathematics"); computer science ("Programming", "Mathematical modeling", "Artificial Intelligence and Robotics"); pedagogical direction ("Teacher of Physics", "Mathematical Education in the System of Professional Training", "Information Technologies in Mathematical Education", "Information Analytics and Educational Organization", "Modern Technologies of Mathematical Education, "Development of Information and Communication Environment of Schools", "Additional Mathematical Education" (a guide in math circles at school and in the system of additional education), "Additional Education in Informatics and ICT", "Distance Education in Mathematics").

The next step was the study of the demand for master's education by bachelor students of the pedagogical department of mathematics and mechanics at Kazan Federal University. The questionnaire was organized. It consisted of two parts. In the first part the question was asked: "Do you plan to study at a master's degree after getting a bachelor's degree?". If a student has no plans to enter a magistracy, he is not involved in the second part of the survey. The second part of the survey included questions on the preferred form of learning, the learning objectives, the preferred directions of MTL.

The survey was conducted at the end of the 2014-15 academic year among students enrolled in the specializations "Mathematics and Informatics", "Mathematics and English". At that time respondents were students of the 3rd and 4th courses (62 and 47 students respectively) who were finishing their training and transferring to the 4-th and 5-th courses, respectively. Based on the results, the following data was obtained: 31% of the third-year students and 56% of the fourth-year students did not plan to enroll in MTL. The rest of the students answered "yes" – 26% of the third-year students and 34% of the fourth-year students; "more likely than not" – 43% of the third-year students and 10% of the fourth-year students. Thus, there were more third-year students who did not decide on their future path after graduating. These figures on the number of bachelors planning to enter a master's program are approximately comparable with the results obtained at the faculty of pedagogy and psychology at Bashkir State University [16].

Any university is interested in the fact that the best bachelor students study at a master's program, so the performance criterion of students planning to study at MTL was analyzed. Currently, Russian universities use two systems of evaluation – the traditional 4-grade scale (5 – "excellent", 4 – "good", 3 – "satisfactory", 2 – "unsatisfactory") and the recently introduced point-rating. Two criteria of bachelors' academic achievement were used. The first criterion is the presence of grades of "good", "excellent" and no grade "satisfactory". The statements identified students who had only "good" or "excellent" on examinations and differentiated credits for all years of study (on the 3rd course it is the results of 6 sessions, on the 4th course – 8 sessions); also, we included students with one or two grades of "satisfactory". The result was that from the whole number of bachelors of the 3rd course who answered "yes" to the question about admission to MTL, "5" grade and "4" grade students accounted for 67%; on the 4th course the number was 48%. Sometimes the progress indicator shows the tenacity of a student not to have grade "3", but not their desire to study to the limit of their capabilities. That is why the second indicator of academic performance was taken — the average score of performance of all third-year and fourth-year students. It turned out that the figure for students, considering learning at MTL, of the third year is 4.25 and of the fourth year – 4.29. So, there was a bigger percentage of the third-year students with grades "4" and "5" than of the fourth-year students; however, the fourth-year students had a higher average score of performance.

Further survey involved the students planning to study at MTL or the "doubting" students. The research of student demand for study in a magistracy has shown that the greatest number of the third-year students preferred part-time form (classes on weekends) of education (38%), the second place went to full-time and part-time (evening classes) (22%); as for the fourth-year students, more than a third of them preferred full-time education, the second place was shared by part-time (evening classes) and part-time classical (sessions twice a year) education (30%). The results of the survey of all students showed that the most preferable forms of education were part-time (34%) and full-time (27%). Despite active effort to attract students to distance learning, only 2 of the bachelors chose this form of training at a master's course.

The next step was to study the reasons for admission to MTL. The following reasons were offered: 1) to deepen knowledge, 2) to obtain additional specialty; 3) to attend postgraduate program (doctorate degree); 4) to get a job; 5) love of learning; 6) to prolong studentship; 7) the parents' wish. They had to assess each of the listed reasons for admission on a 5-point scale (5 – priority target of a student, 1 – meant nothing to them). Analysis of the causes was conducted separately for the third-year and fourth-year students, because the priority aims turned out to be different: most fourth-year students (63%) wanted to deepen knowledge, most third-year students (69%) wanted to obtain additional specialty. The reason that got the second place for all students was to obtain a master's degree in order to increase chances of getting a job.

Now we will rate which educational programs of MTL, deepening or additional, were preferred by students. The statement "I want to study on this speciality, and it is very important to me" was chosen by 21% of the students, who pointed to "deepening" programs; 15% – to "additional" programs. Negative characteristics were investigated too: "this direction is not interesting to me" and "in my opinion, this direction is not interesting to anyone". "Deepening" programs received 11% and "additional" – 36%. In the last line the students were asked to write the direction on which they would like to study. Only 12% of students enrolled in dual specialization "Mathematics and the English language," suggested a master's program, associated with studying mathematics in English ("deepening" program). We have found out that the most favorable and attractive programs to students are those that deepen the bachelor's training.

The most popular among bachelors are the following directions (students indicated them as areas in which they would like to study):

- "Mathematical Education in the System of Professional Training" (36% of students);
- "Mathematical Modeling" (32%);
- "Programming" (29%);
- "Additional mathematical education" (27%);
- "Information Technology in Mathematical Education" (25%).

The most unpopular areas are named: "Teacher of Physics" (66% of negative responses), Geometry (29%), "Artificial Intelligence and Robotics" (27%), "Additional Education in Informatics and ICT" (25%), Information Analytics and Educational Organization" (24%) and "Programming" (24%).

## 4 DISCUSSIONS AND CONCLUSION

Principles and objectives of MTL program are the problem of each state that has a two-tier system of higher education. By teaching at a master's course, some countries are trying to solve the problem of shortage of teachers at schools, others – to raise the quality of professional preparation of teachers who have received a bachelor's degree. In some countries it was decided at the governmental level that a master's degree enhances and deepens teachers' training (Germany, France, Finland, etc.). What is important here is lack of formalism with a two-level training of future teachers, but it is inevitable if a master's program is compulsory. In this respect, the legislation of the Russian Federation gives freedom of choice to a bachelor. This situation makes the creators of master's programs be proactive, strive to provide education of better quality that will be in demand, and watch for new master's programs offered by other higher education institutions. Here it is necessary to take into account opinions of bachelors who plan to get a master's degree. The results of our research have shown that most of them are successful students, and, consequently, they are more conscious and responsible for selecting directions of master's programs. Analysis of the results of a survey of successful students has shown that they are more willing to deepen their training. At the same time, less successful bachelors pay more attention to additional areas that give a second speciality. It can be concluded that the bachelors with higher results are satisfied with the choice they made after finishing school. Now they would like to become more successful teachers by deepening individual areas of specialization. The bachelors who have lower learning results would you like to try themselves in another area. If universities are to meet the needs of all bachelors, both wishing to deepen their knowledge and to obtain additional specialty, the state will receive a greater number of skilled professionals satisfied with their job.

Despite giving students at pedagogical department the choice of different master's programs, the most attractive for them are educational graduate programs that deepen bachelor training. The most attractive for the students has been "Mathematical Education in the System of Professional Training" (36% of students), while 83% of students having "good" and "excellent" grades rated it the highest ("a good direction" and "I want to study on this speciality, and it is very important to me"). These results show that we are faced with the task of developing an educational program in this area. What is special for our country is that there is a serious problem of training mathematics teachers for teaching at physics and mathematics lyceums and specialized classes. Since 2015 there has been a division into basic and specialized levels of compulsory final examination in mathematics for graduates of senior high schools.

The research of willingness of bachelors to study at a master's level and their preferences in the selection of training areas will let us take into account students' opinions while improving existing master's programs and designing and founding new programs in the area of "Pedagogical Education".

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