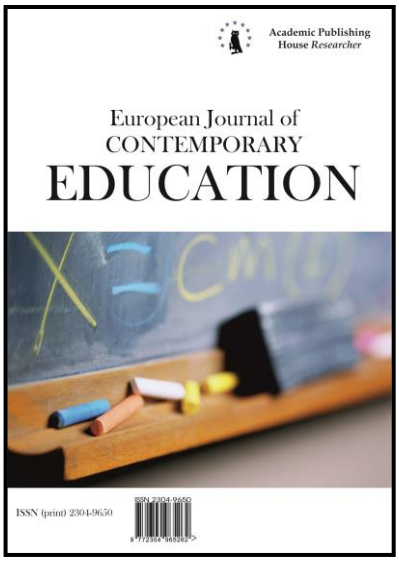
Copyright © 2017 by Academic Publishing House Researcher s.r.o.
All rights reserved.
Published in the Slovak Republic
European Journal of Contemporary Education
ISSN 2304-9650
E-ISSN 2305-6746
2017, 6(4): 700-714
DOI: 10.13187/ejced.2017.4.700
www.ejournal1.com

WARNING! Article copyright. Copying, reproduction, distribution, republication (in whole or in part), or otherwise commercial use of the violation of the author(s) rights will be pursued on the basis of international legislation. Using the hyperlinks to the article is not considered a violation of copyright.



The Students' Research Competences Formation on the Master's Programmes in Pedagogy

Irina Emelyanova [a] , Olga Teplyakova [a] , Lubov' Boltunova [a]

[a] Tyumen State University, Russian Federation

Abstract

The study area is to form research competences for Master's students in the process of mastering the educational programme. The aim of the study is to justify the model to form research competences and the mechanism for its implementation in the process of professionally-pedagogical training.

The research uses methods, such as content analysis of texts for professional standards such as Teacher & Specialist in education/Mentor. The method of determining the type of personality subjective relation with the environment, modeling a research University environment, and comparing Federal state educational standards for the educational level of undergraduate and graduate programs. The study was conducted at the Tyumen State University (Russia) in 2015-2017 in the framework of the Master's program in Pedagogy. The system of accompanying the research of the master students was introduced. Assessment of its effectiveness was carried out according to the master's theses defense reports.

The conducted research allows us to present and describe the model for student research competences formation in the process of implementing master's programmes. Model components are the forming of a social request based on the order from the employer and the introduction of research results into practice, creating a research module to elementary-wise refining steps required for entry into the research activities, saturating all academic disciplines and practices with research content to include students in the completed research cycle, and immersing students in the academic university environment in order to enrich it with the forms of research activities.

The conducted research has shown the effectiveness of the model for the formation of research competences. This model is implemented through the following mechanisms, such as individual support for students' research activities based on the type of subjective connection of the individual with the environment, work at the employer's request and immersion in the academic environment. Under these conditions, the inclusion of students in research raises the training

quality of teacher's education. Our research has shown that the developed model of the research competencies formation is successful.

Keywords: research competencies, educational programme, teachers education, Master's degree, content analysis, professional test.

1. Introduction

Graduate programs in the Russian education system have emerged recently, as a result of Russia's accession to the Bologna process. Much more remains to be clarified and modified, so that graduates of the master's degree will fundamentally differ in the quality of training from the graduates of bachelor's and specialty. It is encouraging that the process of the emergence of educational programmes at the master's level has been launched and is actively supported by the Ministry of Education and Science of the Russian Federation. According to the Federal Law of Education in the Russian Federation, one of the conditions for improving the quality of training for educational programs is "to attract students to conduct research under the guidance of scientists" (Federal law of Russia, 2012).

University professors are actively searching for content, forms and methods of work with the master's degree students. Nevertheless, many questions remain in the organization and content for training of future master's, such as Education in the Master's programme is aimed at training Professionals or Researchers? How is it possible to become both an expert and a researcher in two years of training, considering that a number of master's programmes, including pedagogical ones, can be done without a basic pedagogical education? What University professors should focus on to improve the competitiveness of their graduates?

A. Background.

In the world educational practice the issue of research competences formation is discussed quite widely. Researchers from different countries prove the need for development of teachers' research competence and disclose that this competence positively affects the quality of education.

Professor of Norwegian University of Science and Technology May Britt Postholm came to the conclusion that development of teacher educators' research competence can enhance development both in teacher education and in school. (Postholm, 2016). Khan and Chishti (2012) prove the necessity of formation of research competence of future teachers during their higher education at the University. «Competence is a fundamental element for delivering quality education and the teacher is a primary agent for imparting quality education. The target of quality education can be achieved once the quality of teachers». The authors attribute the quality of teachers with the development of their research competences. The way to achieve this is generating competence among research supervisors/university teachers-which, in turn, will have an impact on the quality in research work of students/supervisee (Khan, Chishti, 2012).

Researchers note the teacher's research competence is complex. Researchers at the Daugavpils University of Latvia conducted an analysis of the development of research competencies of doctoral students including 39 doctoral students of programme "Pedagogy". Three competency groups were identified: informative, communicative and instrumental. The authors came to the conclusion that «in general, in the structure of doctoral students' research the most poorly developed are the instrumental competences». The authors note a positive effect of the systemic formation of research competencies supported by the European Social Fund (ESF). (Olehnovicaa, Bolgzdaa, Kravale-Pauliņa 2015). Lambrechts and Van Petegem investigete the relation between competences for sustainable development and research. The authors discuss the possibility of the integration of competences and explores the contribution of research-based methods to acquire competences for sustainable development (Lambrechts and Van Petegem, 2016).

Vincentas Lamanauskas and Dalia Augiene (2016) prove teaching is and should be research based profession. The question was whether the students consider the research competence necessary. The authors concluded that students highly value scientific research activity significance to teacher's profession and understand this activity multifaceted influence on teacher's activity: both teacher's professional activity improves and teacher's personality. Researcher career aspect is obviously double-sided. Two basically equal groups have been discerned. One of them claimed, that their attitude to scientist career is positive and they express wish when having opportunity to do scientific work. The other half of students have negative attitude to scientist career and think, that

this is uninteresting, hard and poorly valued activity. However research showed, that even 70% of students understand SRA effectiveness as study process improvement. Continuous scientific research activity improvement and enhancing effectiveness is important in the study process. This study was conducted on the basis of two Lithuanian universities – Siauliai University and Lithuanian University of Educational Sciences.

A similar study was conducted by Finnish researchers. Hannele Niemi and Anne Nevgi (2014) have investigated how student teachers benefit from authentic researcher experiences as part of their pre-service education. The data were collected by electronic questionnaires at two Finnish Universities. Teacher education programs guided student teachers to use and conduct research in the teaching profession. The results indicate that student teachers value research experiences. Research studies promoted professional competences and supported students' growth toward evidence-based practice and 21st century skills.

Analysis of the results of modern research have shown that research skills can be learned and should be learned. Universities create special programmes for the development of research skills of teachers. For example researchers from the University of Tennessee (USA) and University of Milan Bicocca (Italy) describe a cross-cultural PD model for early childhood teachers in Italy and the USA. This model develops cross-cultural research competence and includes a cross-national exchange amongst two teacher communities within which teachers view practice in another context and engage in dialogue about their own and others' practices. The authors find that the developed model of participatory cross-cultural research is successful. (Morana et al., 2017).

Sabine Hoidn and Sibylle Olbert-Bock (2016) describe a newly developed research curriculum for management students implemented in a new master's programme in Business Administration at a mid-size university of applied sciences in Switzerland. Three pedagogical challenges in teaching research methods were addressed to target the theory-practice gap in management education. The authors opted for a research methods curriculum that links management research and practice by encouraging pluralism in knowledge-production forms, a more holistic view of competence development in management education and a learning-centred course design.

A curriculum for learning and research methods was designed for example in Radford university USA. Allison Wisecup presented a survey data for a sample of students who have and have not completed a research methods course. Completion of a research methods course is associated with more positive affect toward research methods and availability of greater cognitive competence in research methods knowledge and skills (Wisecup, 2017). So universities create special research methods courses and students find them useful.

In the framework of the teachers research competences formation, a special method is proposed. For example Anesa Hosein and Namrata Rao suggest a method of student research competencies formation – students' reflective essays of their research experience. Qualitative analysis of the students' reflective essay demonstrated that students showed an awareness of both their research skills such as choosing an appropriate research instrument and their researcher identity such as the metacognition of their research competence (Hosein and Rao, 2017).

The traditional way of the research competences formation is the students research paper under the supervisor guidance. Elaine Munthe and Magne Rogne (2015) believe undergraduate research is one way to qualify teachers for professional learning and innovation. They investigate how Initial teacher education programs in Norway address research for students. They come to conclusion that these programs emphasize research, but teacher-led more than student engagement. Therefore the first experience of the research will be obtained with the support of the scientific supervisor.

This article describes the system for the teachers' research competence formation in the Tyumen State University (Russia) on the basis of the Master's program "Pedagogy".

B. Conceptual approaches to organize research activities for master's students

The developmental value of scientific research activities in the field of teacher training for master's programs is to obtain a specialist of new quality who is capable of thinking independently, see problems and contradictions, and to find scientifically based productive solutions. The well-known classic of pedagogy Adolf Diesterweg argued that without a desire for scientific work, the teacher "will inevitably fall under the authority of three pedagogical demons: mechanicality, routine and banality" (Diesterweg, 1956: 322).

Pedagogical research has a number of fundamental differences that should be taken into account in training for the master of pedagogy.

Complexity of the subject of pedagogical research allows for "the allocation of certain positions and aspects" of a particular phenomenon or process. (Zagvyazinsky, 1995: 21). One and the same phenomenon, for example cognitive interest can be considered through the administrative, didactic, social aspect etc. Therefore, in the process of mastering the educational program of the master's level, students on the one hand must learn to immerse themselves deeply in the subject of research, while on the other hand to look at the problem widely; considering the subject under study in a diverse set of various conditions and circumstances.

The results obtained during pedagogical research are characterized by openness and incompleteness of conclusions. Hence, a pedagogical study conducted by one researcher cannot resolve all the identified problems. For example, the task to determine the factors, identify mechanisms, find and justify effective ways. This way, we can be sure that the next researcher will reveal additional factors and conditions. So, students in the process of mastering the educational program should form an understanding of the community, the openness of research, ability to compare the obtained results with the results of other studies and ability to predict the prospects of the research.

Pedagogical research cannot be a desk study based on secondary information/data obtained in the course of other studies. The pedagogical research should be based on primary information – it is data obtained as a result of a specially organized and conducted experiment or pilot study in the real pedagogical conditions. Therefore, students, when conducting research, should go to a specific educational area and be included in a real educational process. Only in this case pedagogical research will become a real professional test.

Modern reality is pragmatic enough to be apply to science. The resources spent on science should be justified. The best result of the research is an output on concrete decisions in the field of pedagogical reality. Identifying the trend, features, conditions for increasing the effectiveness of a particular educational process, it is necessary to think about the practical significance of the study. Therefore, scientific research in the field of pedagogy cannot be justified by the researcher's interest, but must have a social order, reasonable tasks of educational institutions and focus on putting into practice.

Pedagogical research takes place in a complex system of connections and relations in the field of education, upbringing and development of the individual. "At the same time, the growing and developing person is included in this process as a subject of education" (Zagvyazinsky, Atakhanov, 2006: 50). All this imposes high moral demands to organize, conduct and implement the results of the study. An experiment in pedagogy usually affects someone's interests, such as students, parents, teachers and managers. Standards of scientific ethics are not formulated in the form of any approved official decrees, but they do exist. Therefore, in the planning process of the formative experiment, there must be a check on morality. This topic should be discussed at all stages of planning and organizing a formative experiment.

Pedagogical research is carried out within the institutional environment, which puts "significant restrictions on the teacher's behavior" (Korthagen, 2004: 78). Here, various scenarios are possible, such as understanding the mission, beliefs and actions in accordance with the environment. But there may also be a situation, where the researcher might have to choose to refuse, or to carry-on the research and how to use its results. Therefore, in the process of training, students must gain the experience of coordinating the research at all stages of its planning, organizing and discussing with the official structures of the educational institution.

Certainly, the pedagogical research that accompanies teaching activity brings additional trouble, but this is a completely different level of pedagogical activity, which was termed "reflective practice" (Norton, 2009: 54). It is reflective practice that leads to positive changes in teaching. With all the complexities of organizing and conducting pedagogical research, an educator who accompanies his pedagogical activities by research will be distinguished by his readiness for development. This is the part of the teachers that can "enrich the theory with practice, which in turn can influence policy" (Norton, 2009: 38).

C. The purpose of the research is to justify the system for the teachers' research competence formation in the Tyumen State University (Russia) on the basis of the Master's program

"Pedagogy", to determine organizational and pedagogical steps during research competence formation .

2. Research methods

The study was carried out using the following methods:

–Content analysis of texts for two professional standards: (a) Teacher & (b) Specialist in education / Mentor was conducted. These standards cover pedagogical activities in the field of Preschool, Primary, Secondary & High School Education. Content analysis method made it possible to identify meaningful priorities in teacher's professional activity, to determine the place of teachers' research competencies. Pearson's chi-squared test ($\chi 2$) was used to prove the observed differences between the categories (types of teacher's professional activity) arose not by chance, but statistically significant.

–The comparative method was used to study federal state educational standards for the educational level of the bachelor's and master's degrees in the field of filling research content.

–Author's technique Irina Yemelyanova (2008, 120-126) by identifying the type of subjective connection of students with the educational environment of the university was used. With the help of this technique, we have identified types of relation between students and the educational environment, the behavior of students depending on the type of relation and their attitudes toward research activities.

–Method of modeling the research environment of the educational institution in the aggregate of interrelated components was used. We created, put into practice and justified the effectiveness of the model of scientific research competences formation.

3. Research activities in professional standards "Teacher" and "Mentor"

A professional standard is a document that defines the qualification requirements that an employee needs to carry out his professional activities. Professional standards are developed by the professional community itself and are accepted by the Ministry of Labour and Social Protection of the Russian Federation. Professional standards set the requirements not for the process of education, but for the level of education and for work.

To understand whether the teacher is carrying out research activities within the framework of his work activity, we have analyzed the content in two professional standards: Teacher (Act of the Ministry of Labour and Social Protection of the Russian Federation 2013) and Specialist in education / Mentor (Act of the Ministry of Labour and Social Protection of the Russian Federation 2017). Both these standards relate to the teaching field and can be used as a basis for the development of educational programs at the master's level.

Using the content analysis method we conducted a study to determine the proportion of research content in the professional standards "Specialist in education/Mentor" and "Teacher". The unit of analysis was professional actions, skills, knowledge which were described in the professional standards. Each professional action, knowledge, skill was attributed to one of the six teacher's professional activity: pedagogical, project, social- cultural, research, methodical, managerial. The frequency of the occurrence of the types of teacher's professional activities in the professional standards was calculated. The content that is reflected in the professional standards is presented in Figures 1 and 2. The general trend has been clearly demonstrated in professional standards, pedagogical, methodical and managerial activities are given priority.

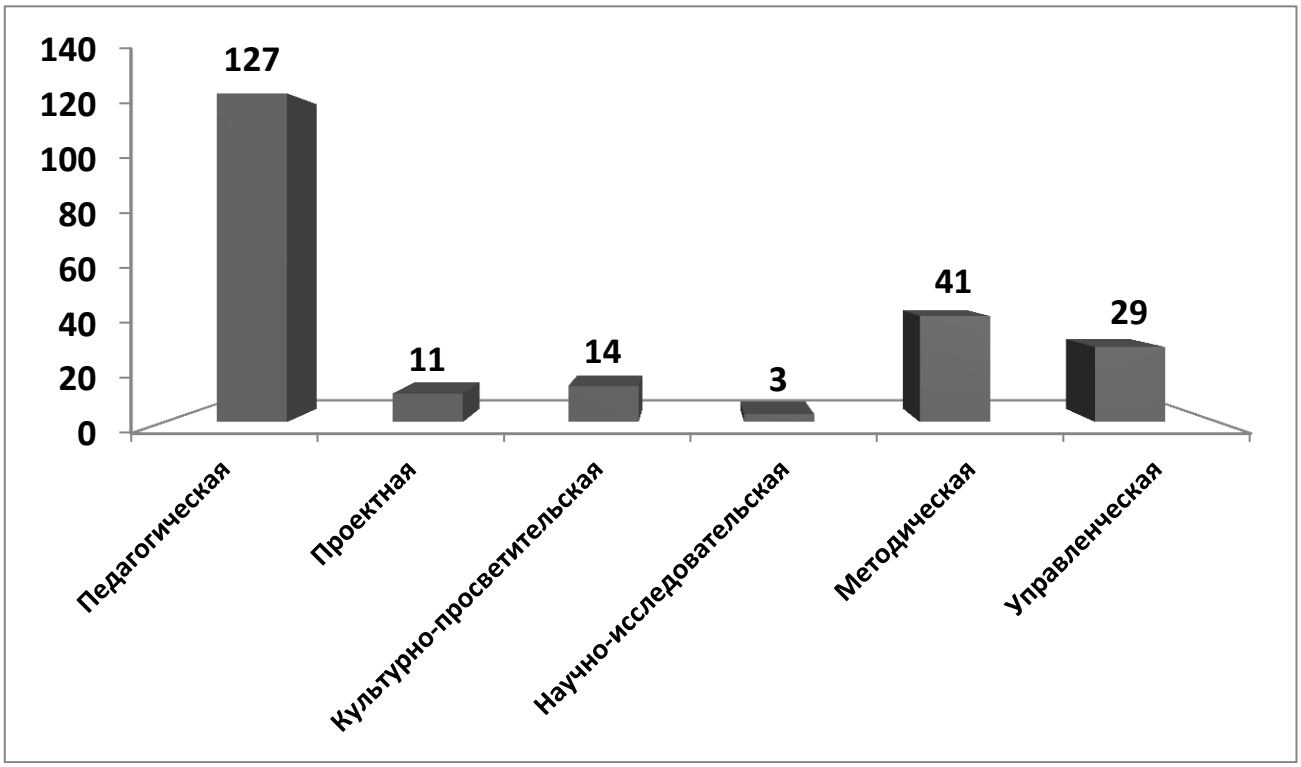


Fig. 1. Activities in the professional standard "Teacher"

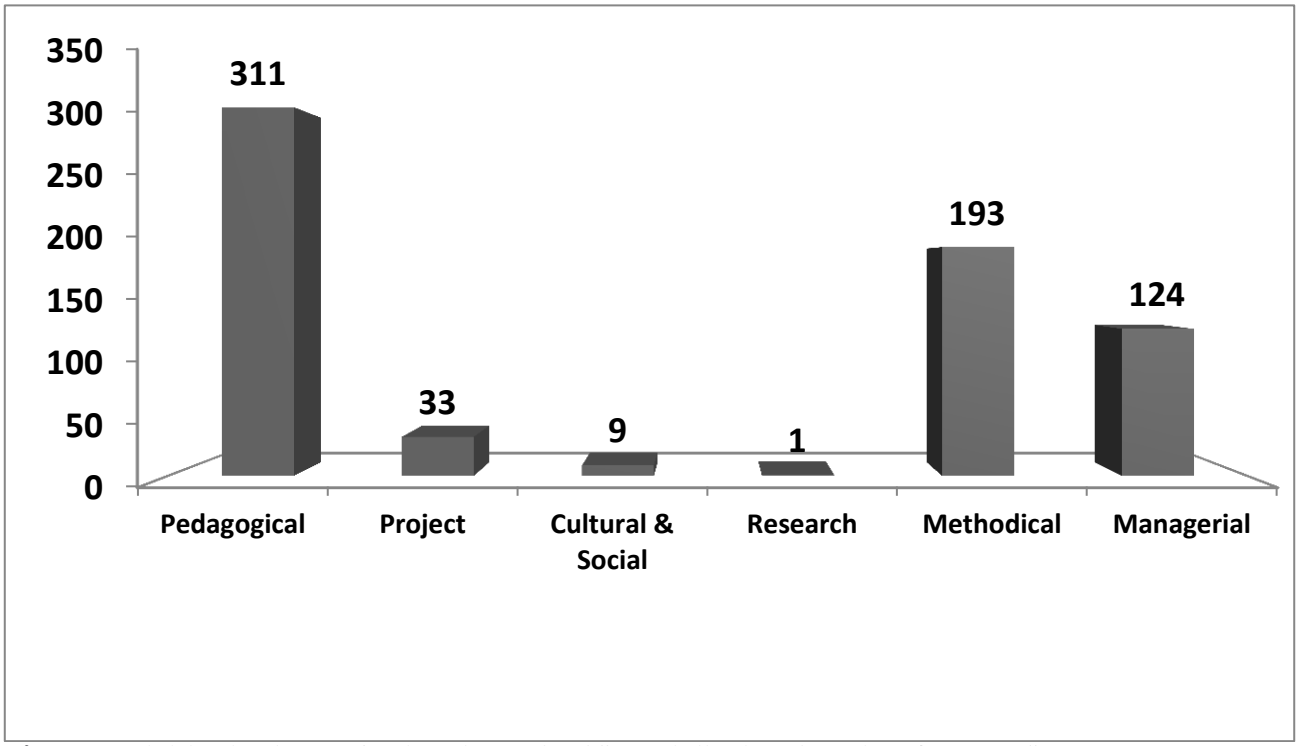


Fig. 2. Activities in the professional standard "Specialist in education / Mentor"

Pearson's chi-squared test ($\chi 2$) was used to prove the observed differences between the categories arose not by chance, but statistically significant. The value of the test-statistic was calculated by the formula:

$$\chi^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

The results of the calculation are presented in Table 1.

Table 1. The frequency of the occurrence of activity types in the professional standards "Specialist in education / Mentor" and "Teacher"

activity types(*i)*	Specialist in education / Mentor		Teacher	
	observed frequency (*Oi)*	expected frequency (*Ei)*	observed frequency (*Oi)*	expected frequency (*Ei)*
Pedagogical	311	112	127	38
Project	33	112	11	38
Cultural & Social	9	112	14	38
Research	1	112	3	38
Methodical	193	112	41	38
Managerial	124	112	29	38
Total	671	671	225	225
χ^2	675		281	

According to the calculation chi-squared test (χ^2) is 675 for the distribution of teachers' activity types in professional standard "Specialist in education / Mentor" and chi-squared test (χ^2) is 281 for professional standard "Teacher". Critical value χ^2 is 15,09 when the number of degrees of freedom is 5 (n – 1) and p=0,01. Critical value χ^2 is equal for both cases. Estimated value χ^2 is more than critical value for both cases: 675>15,09 and 281>15,09. Thus, the null hypothesis is rejected for both cases. Consequently, the deviations in the frequencies go beyond the range of random oscillations, that is, the variation are statistically significant.

The study showed that pedagogical content is frequently occurred. Methodological and managerial contents occupy also a significant place. Scientific content is reduced to an insignificant minimum. The conclusion is that the research activity for the teacher in the light of the professional standards of "Teacher" and "Specialist in education/Mentor" is not a priority. In fact, it is secondary.

Undoubtedly, "professional standards should form the core of curriculum of pedagogical specialties and used in assessing the professional qualities of the teacher" (Zabrodin, Gayazova, 2013), but professional standards are not a dogma. They should be creatively absorbed by the developers of educational programs based on the purpose of professional training.

Therefore, when developing curriculum at the master's level, it is not advisable to minimize scientific research activities and should not follow the priorities of the professional standards, which focus mainly on pedagogical, methodological and managerial activities. It should be understood that the appointment of professional and educational standards are different. Allocation of labor functions and labor actions in professional standards, allow to formalize labor relations to specify professional standards. The purpose of educational standards is the diversified professional development of the individual.

In the duties of a teacher or specialist in education (mentor), there are no requirements to conduct research. But the teacher who is conducting the research will be qualitatively different from the one who doesn't do the research. It is the researcher who has the ability of "reflective practice," capable of qualitatively improving the pedagogical process.

In the process of professional education, students must learn the methodology and technique of pedagogical research to seize certain elements of research activity, to reach the level of understanding to know the meaning of pedagogical research in the context of an educational situation.

4. Research competencies in educational standards Pedagogical Education of bachelor's and master's degree

Educational standards are adopted by the Ministry of Education and Science of the Russian Federation and establish requirements for the process and quality of education and educational programmes. Student competencies including the research skills are described in the Federal state educational standards: Pedagogical Education (bachelor degree) (Act of the Ministry of Education and Science of the Russian Federation 2015) and Pedagogical Education (master degree) (Act of the Ministry of Education and Science of the Russian Federation 2014). Educational programmes at the bachelor's and master's level have a number of fundamental differences in research competencies requirements.

There are different types of activities which students must learn during the training in bachelor's and master's degree. Among them there is research activity for bachelor students and scientific research activities for master students.

Bachelor students' research activity includes the use of research methods, formulating and solving research problems in professional activity. Master students' research activity includes analysis, systematization and generalization of scientific research results, cconducting scientific research in the education field independently, complex application of research methods for solving specific research tasks, the use of modern scientific methods and technologies. As we see, the research activity at the master's level is carried out much more widely and comprehensively.

An obligatory component of the master's curriculum is a scientific research conducting, for what credit units are provided in each semester. The basis for the master's thesis is the forming experiment. These requirements do not apply for bachelor theses.

The bachelor's and master's degrees are differentiated according to the requirements for pedagogical staff. At least 75 % of the teachers providing educational process in the master's programme, must have a degree of doctorate in science and an Academic title. Heads of the master's should regularly conduct scientific research and publish in domestic and international journals. For bachelor's degree lower requirements have been set: at least 50 percent of educators should have academic degrees of doctor or candidate of science.

Thus, the research competencies requirements in the Master's programmes are much higher than in the Bachelor's programmes.

5. Bachelor and Master Students: various research interactions with the educational environment

There are significant differences in the contingent, which is to be taught in undergraduate and graduate programs. We mean no age differences that objectively exist. We investigated the differences in the quality of interaction with the environment that the student establishes by studying undergraduate and graduate programs.

Irina Emelyanova (2008) has developed a classification of students according to their interaction with educational environment. Students were classified based on their contact with their educational environment in the following categories: (a) intellectual and creative (research), (b) pragmatic, (c) contemplative, (d) simulation and (e) mixed.

The author's technique of Irina Emelyanova was used in this study. The question was what is the share of bachelor and master students who has a research connection with the educational environment. The research was conducted in 2016 in the Tyumen State University in the Pedagogy and Psychology Institute. The survey included answers from undergraduate and graduate students studying in the pedagogy programmes. 63 bachelor students and 43 master students were questioned. They were diagnosed to identify the type of interaction between students and the educational environment of the university. The methodology included a list of questions in response to which students denoted the following types of communication with the environment i.e. intellectual-creative (research), pragmatic, contemplative, imitative and mixed.

The study revealed the following.

Types of interaction with the environment which are represented among undergraduate students of respondents: the intellectually creative type – 44.8 %, the pragmatic type – 20.5 %, contemplative type – 12.2 %, imitation type – 20.3 % and mixed type – 12.2 %. Graduate students gave the following observations of respondents: the intellectually creative type – 59 %, pragmatic type – 17 %, contemplative type – 2 %, imitation type – 2 % and mixed type – 20 %.

As we see, graduate students, more often compared to undergraduate students, establish an intellectual-creative type of connection with the environment. Among master students, unlike bachelor students the contemplative and imitative types of communication with the environment are negligible. This means that the master students are more conscious with creative or pragmatic goals and objectives. In our opinion, training at the master's level has substantial resources for organizing scientific research activity.

Nevertheless, among graduate students there are intellectuals and imitators. Behavior of different types of students will differ significantly in the situation of involvement in scientific research activities. Consider real-life examples.

Vasilissa (an Intellectual-creative type) had a pedagogical education and was a student at the undergraduate course, who actively participated in the Olympiads and was always successful. Now she is enthusiastically working on the topic of research and began to publish articles. Already in the first month of training in the master's program, she won first place in the regional competition of student scientific research papers. There are no questions with study in principle. Vasilissa actively applies for participation in conferences, she has also received a grant.

Alexander (Simulation type) has a bachelor's in pedagogical education and has established himself as a public figure. His studies never fascinated him. He likes interactive forms, where he gets the opportunity to present himself and does it successfully. But, since the start of master's training, problems with study have become apparent. The reason for this are varied forms of employment. With great difficulty he passed the session. Hence, the scientific research work that he provided was of poor quality.

Vasilissa more successfully mastered the scientific research competencies. Her active and creative attitude to intellectual forms of work was a necessary condition for the quality of mastering the educational program.

At the same time, the educational environment should help both Vasilissa and Alexander to develop and grow professionally. Vasilissa needs creative cooperation and assistance in advancing science but Alexander needs a step-by-step immersion in research, which would eventually lead to completion. The model of vocational training in the system of pedagogical education of the master's level, should create the opportunity for success in scientific research for everyone; in our case, both Vasilissa and Alexander.

5. The model of scientific research competences formation: University of Tyumen State case

5.1. Model components of the scientific research competencies formation in the University of Tyumen

The model of research competencies formation has been tested in the process of implementing the Master's programme "Methodology and methods of social education" in Tyumen State University since 2011. The general idea was to bring the educational situation closer to real practice by organizing professional testing or approbation. Professional approbation can be implemented in the following forms: (a) in a real educational process, (b) in the imitation training process and (c) in communication (Guruzhapov, Margolis, 2014, 148).

Research approbation within the framework of the master's program can and should be implemented in a real educational or learning process. Such professional approbation of a graduate student research activities is the master thesis, which should form research competencies.

The conceptual idea behind the model for the research competencies formation is to supplement and enrich the research module with the capabilities of all disciplines of the educational program and the scientific research environment of the university, so as to include students in the whole research cycle (Fig. 3).

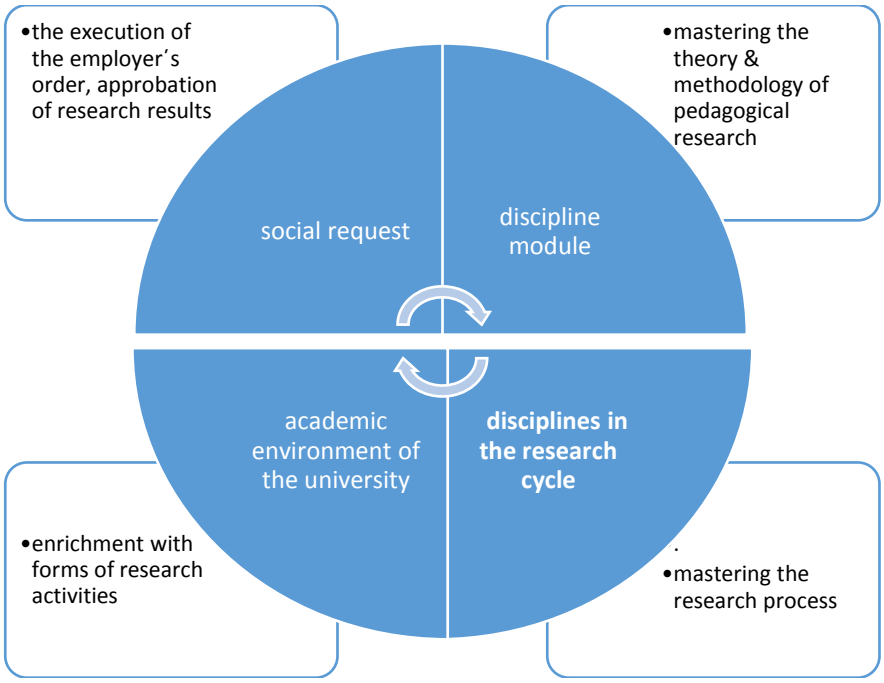


Fig. 3. Model for the research competencies formation

5.2. Executing the employer order and approbation of the research

Entry into research activity begins with the choice of a topic, corresponding to the profile of the training. Students have the right to propose a research topic. But it is more welcome to join those frontiers that determine the research priorities of the department, institute and university. Receipt of an order from the employer to develop and approbate the research significantly increases the practical orientation of the research project.

The institutions and organizations that formulated the research order, should be interested in its results, be ready to discuss them and under certain conditions, introduce them. Only then will the student's research be completed and the researcher will have a qualitatively new experience. The procedure for approving the topic, adopted at the Tyumen State University in master's programmes, involves the discussion of the research topic at the department. The condition for approval of the topic is its justification, including the research request from the employer.

Completion of the research is accompanied by the introduction of its results in the pedagogical process. The technique, program, methodology, technology, etc. can be introduced into the activity of the educational organization. A certificate of the implementation of the research results is provided for the defense of the master's dissertation. A certificate is not a pre-requisite for a thesis defense, but is advisable.

According to the reports of the Institute of Pedagogy and Psychology (Tyumen State University) for 2015-2017, 70 % of full-time and part-time students of the master's program provided a certificate of the research results implementation. This means that research results are actively used in practice.

These regulated procedures are equally important for all types of students. For example, Alexander is put in the necessary framework and is controlled by the Supervisors. Whereas, Vasilissa strives to develop and establishes productive professional relationships.

5.4. Mastering the theory and methodology of the pedagogical process within the disciplines of the research module

The student must acquire all the necessary elements of the research. The necessary and sufficient elements of the research module mean the mastering of the research structure and procedure in accordance with the training profile. For entry into research activities, subjects such as “Methodology and methods of research”, “Pedagogical experiment”, and “Qualitative and quantitative diagnostic methods” are necessary. These and other disciplines are needed to put the

research fragments piece by piece: to teach how to determine the problem, contradictions, subject, object, to plan a controlled and forming experiment etc.

While mastering the research module, students master the theory and methodology of pedagogical research within the framework of competencies indicated in federal state educational standards. Taking into account the variety of research competencies defined in the educational standard, it is advantageous to allocate clusters of competencies. A cluster of competences is a set of closely related competencies, combined according to certain criteria. Combining competences within the cluster, allows you to identify the essential characteristics in the professional training and create the appropriate evaluation means.

From the educational standard 44.04.01, Pedagogical education (master's level), the following clusters of research competences have been singled out by us: analytical, information, project and communicative (Table 2).

Table 2. Educational result on mastering the research module

Cluster of research competences	Content	Forms
Analytical	Analysis of pedagogical facts at various stages of the study	Essay, analytical report, interpretation of fact
Information	Work with information: documents, scientific articles, monographs, Internet resources	Abstract, summary, literature review, synopsis
Project	Preliminary assessment, pedagogical experiment, final assessment.	Research project, model defense, solution of complex situational task
Communicative	The use of various forms of scientific communication in the process of selecting, discussing and approbating the research	Report, presentation, article

Each cluster assumes the appropriate content and forms of work, which will be measured.

5.5. Mastering the research process in all educational disciplines of the educational program

Research activity assumes mastering all logic of scientific search, but not separate elements. The exploratory search involves successive steps that begin with defining contradictions of real practice and end with the introduction of research results into practice. Therefore, mastery of research competences cannot be limited to mastering individual elements of the study. It must assume the passage of the entire research cycle.

Therefore, it is necessary to attract resources not only from the disciplines of the research module, but from other academic disciplines and practices. Each academic discipline has its own content and organizational resource (assignments, tests, term papers) that can be used in the organization of pedagogical research. Using these resources, allows us to build a holistic research cycle, which in turn helps students to master the logic of conducting independent research. Exploratory search is a logically constructed cycle that begins with the definition of contradictions in real practice and ends with the introduction of research results into practice.

An example of organizing and supporting the pedagogical process is the cycle of research activities of students developed by the Department of General and Social Pedagogy of Tyumen State University (Table 3).

Table 3. Cycle of the research module implementation within the educational program "Methodology and methods of social education"

Semester	Research activities content	Disciplines practices	Educational result
1	Determining the relevance of the topic and the research problem and the designation of contradictions. Introduction to basic documents.	Modern problems of science and education.	Defining the problem and research topic. Forming of a source base.
1	Research methods learning and collected material analysis.	Methodology and methods of scientific research.	Defining the object, the subject of the study and the procedure for research. Drawing up an individual research plan.
	An analysis of the real educational situation on the indicated research problem.	The pedagogical practice.	Determining the contradictions of real practice in the context of the problem under study.
1,2	Literature review on the research topic.	Business foreign language	Annotations of foreign articles on the research topic.
2	Organizing and conducting pedagogical experiment or experience description.	Pedagogical experiment	Planning of ascertaining and forming experiment.
	The study of the peculiarities of the research organizing and conducting in educational organization (depending on organization type).	The pedagogical practice	Conducting a pilot study on the topic of the master's dissertation.
3	Diagnostics of the separate area conditions for education or upbringing.	Monitoring the development environment	Selecting diagnostic techniques on the research topic.
	Making research materials. Preparing the presentation. Discussing the results of the research.	Scientific-pedagogical practice	Conducting of the ascertaining experiment.
4	Formulating the concept. Revealing scientific novelty and practical significance of the research.	Innovative processes in education	Formulating scientific novelty and practical significance of the study.
	Conducting a formative and summative experiment.	Pre-diploma practice	Presentation of materials.
4	Formalization of research results.	Preliminary thesis defense	Formalization of scientific results. Preparing the text of the master's dissertation.
4	Defense of the master's thesis	State attestation as a teacher	Master's degree

5.5. Enrichment with forms of scientific research activities in the university academic environment

Pedagogical research cannot be a study of one person. It should be actively discussed by the scientific community. This requires an appropriate scientific environment. Academic environment of the university should create conditions for mastering additional specific forms of scientific-research activities which are not provided by the educational program: grant writing, participation in conferences, methodological seminars , intellectual competitions.

Experience has shown that students enrolled in the Master's program are able to participate in grant activities, prepare scientific articles and win scientific research competitions. But to include students in additional forms of research activities, incentives are needed that encourage development. For example, in the case of students such as Vasilissa and Alexander. For Vasilissa it is important to perceive the spirit of research, to learn how to enjoy the intellectual process, to pass through the expectation of discovery and the excitement of how your fellow students and scholars will meet your study. As for Alexander, the academic environment should give the first successful samples, which must be carefully accompanied by research scientists, which in the future can give birth to scientific interest.

6. Conclusions

Pedagogical educational programs at the master's level should be focused on the training of educators & researchers, who are able to see problems in reality to set research tasks, to understand the meaning of conducted research, and to be responsible for the implementation of research results in the real educational process.

The conducted research has shown the effectiveness of the model for the formation of research competences. This model is implemented through the following mechanisms: individual support for students' research activities based on the type of subjective connection of the individual with the environment, work at the employer's request and immersion in the academic environment.

Experience in the implementation of the p*edagogical* educational program of the master's level showed: the formation of students' research competences will be effective if:

The research module allocated as part of the educational program will be focused on mastering the basic elements of scientific research, which should be consistent with the specifics of pedagogical activity.

The educational programme on the basis of all educational disciplines and practices will ensure the students' inclusion in the completed research cycle, that enables students to master the logic of pedagogical research.

The choice of destination and research topic will be based on the employer's order and will become a real professional test for students.

The scientific university environment will create conditions for approbation of research results and enable student to master additional specific forms of research activities which are not provided for in the educational program.

Under these conditions the students' inclusion in scientific research will raise research training in the system of pedagogical education to the level of the educator-researcher who has the skills, ability and readiness to conduct scientific research; while possessing a formed research interest in the phenomena of professional life.

References

Act of the Ministry – Act of the Ministry of Education and Science of the Russian Federation. 21 November, 2014. № 1505. «The Federal State Educational Standard of Higher Education: 44.04.01 Pedagogical Education (master degree)» (in Russian). Retrieved from http://www.consultant.ru/document/cons_doc_LAW_174065/

Act of the Ministry of Education – Act of the Ministry of Education and Science of the Russian Federation. 4 December, 2015. № 1426. «The Federal State Educational Standard of Higher Education: 44.03.01 Pedagogical Education (bachelor degree)» (in Russian). Retrieved from http://www.consultant.ru/document/cons_doc_LAW_192459/

Act of the Ministry of Labour – Act of the Ministry of Labour and Social Protection of the Russian Federation. 18 October, 2013. № 544H. «Professional Standard: Teacher» (in Russian). Retrieved from http://www.consultant.ru/document/cons_doc_LAW_155553/

Act of the Ministry of Labour and Social – Act of the Ministry of Labour and Social Protection of the Russian Federation. 10 January, 2017. № 10H. «Professional Standard: Specialist in education/ Mentor» (in Russian). Retrieved from http://www.consultant.ru/document/cons_doc_LAW_199498/

Allison Wisecup – *Allison Wisecup*. "Take It or Leave It: Students' Attitudes about Research Methods." *TEACHING SOCIOLOGY*, January 2017.

Beshentseva, 2016 – *Beshentseva, S.* (2016). Pedagogical support of students on the basis of identifying the type of subjective connection the individual and the environment (in Russian). *In Conference materials book: Pedagogy and psychology in the integrated space of science and practice*. Tobolsk, Russia: Tyumen State University.

Diesterweg, 1956 – *Diesterweg, A.* (1956). *Selected pedagogical works* (in Russian). Moscow, Russia: Ministry of education.

Emelyanova, 2008 – *Emelyanova, I.* (2008). *The Upbringing Function in the Classical University: history, theory, current practice* (in Russian). Tyumen, Russia: Tyumen State University.

Federal law – Federal law of the Russian Federation. 29 December, 2012. № 273-FZ «On education in the Russian Federation» *(in Russian). Rossiyskaya gazeta (official publication). 31 December 2012*. Retrieved from http://www.consultant.ru/document/cons_doc_LAW_140174/

Guruzhapov, Margolis, 2014 – *Guruzhapov, V., Margolis, A.* (2014). Designing Models of Practice-oriented Undergraduate Training Program in Psychological and Pedagogical Education (Primary school teacher) Based on Networking of Educational Institutions, Implementing Higher Education and Primary Education Programs. *Psychological science and education psyedu.ru*, 3, 143-159. Retrieved from http://psyjournals.ru/files/71596/pno_3_2014_gurujapov.pdf

Hannele Niemi – Hannele Niemi, and Anne Nevgi. "Research Studies and Active Learning Promoting Professional Competences in Finnish Teacher Education." *Teaching and Teacher Education*, no. Volume 43 (October 2014): 131–42.

Hosein, Anesa – Hosein, Anesa, and Namrata Rao. "Students' Reflective Essays as Insights into Student Centred-Pedagogies within the Undergraduate Research Methods Curriculum." *Teaching in Higher Education* 22, no. 1 (January 2, 2017): 109–25. doi:10.1080/13562517.2016.1221804.

Jim Gleeson, 2017 – Jim Gleeson, Ciaran Sugrue, and Joanne O'Flaherty. "Research Capacity and Initial Teacher Education Reform: Irish Experiences, International Perspectives." *Teaching and Teacher Education*, February 2017.

Khan et al., 2012 – *Khan, Shahinshah Babar, and Saeed-ul-Hasan Chishti* (2012). "Effects of Staff Training and Development on Professional Abilities of University Teachers in Distance Learning Systems." *Quarterly Review of Distance Education* 13, no. 2: 87–94.

Korthagen, 2004 – *Korthagen, F.* (2004). In Search of the Essence of a Good Teacher: Towards a more holistic approach in teacher education. *Teaching and teacher education*, 20(1), 77-97.

Lamanauskas, 2016 – *Lamanauskas, Vincentas, and Dalia Augiene* (2016). "Scientific Research Activity of Students Pre-Service Teachers of Sciences at University: Significance, Readiness, Effectiveness And Career Aspects." *Journal of Baltic Science Education* 15, no. 6: 746–58.

Lomov, 1984 – *Lomov, B.* (1984). *Methodological and theoretical problems of psychology*. Moscow, Russia: Nauka.

Mary Jane Morana – Mary Jane Morana, Chiara Boveb, Robyn Brookshirea, Piera Bragab, and Susanna Mantovanib. "Learning from Each Other: The Design and Implementation of a Cross-Cultural Research and Professional Development Model in Italian and U.S. Toddler Classrooms." *Teaching and Teacher Education*, April 2017.

Munthe, 2015 – Munthe, Elaine, and Magne Rogne. "Research Based Teacher Education." *Teaching and Teacher Education*, February 2015.

Norton, 2009 – *Norton, L.* (2009). *Action Research in Teaching and Learning: A practical guide to conducting pedagogical research in universities*. Abingdon, UK: Routledge.

Olehnovica, 2015 – Olehnovica, Eridiana, Ingrida Bolgzda, and Mārīte Kravale-Pauliņa. "Individual Potential of Doctoral Students: Structure of Research Competences and Self-Assessment." *Procedia - Social and Behavioral Sciences*, February 12, 2015.

Postholm, 2016 – Postholm, May Britt. "Collaboration between Teacher Educators and Schools to Enhance Development." *European Journal of Teacher Education* 39, no. 4 (August 7, 2016): 452–70. doi:10.1080/02619768.2016.1225717.

Sabine Hoidn, 2016 – Sabine Hoidn, and Sibylle Olbert-Bock. "Learning and Teaching Research Methods in Management Education: Development of a Curriculum to Combine Theory and Practice – a Swiss Case." *International Journal of Educational Management*, 2016.

Wim Lambrechts, 2016 – Wim Lambrechts, and Peter Van Petegem. "The Interrelations between Competences for Sustainable Development and Research Competences." *International Journal of Sustainability in Higher Education* 17, no. 6 (October 26, 2016): 776–95. doi:10.1108/IJSHE-03-2015-0060.

Zabrodin, Gayazova, 2013 – *Zabrodin, Y., Gayazova, L.* (2013). The professional standard of a teacher: the problems of socio-professional discussion. *Psychological science and education psyedu.ru*, 3, 29-37. Retrieved from http://psyedu.ru/files/articles/psyedu_ru_2013_3_3379.pdf

Zagvyazinsky, Atakhanov, 2006 – Zagvyazinsky, V., Atakhanov, R. (2006). *Methodology and methods of psychological-pedagogical research* (in Russian). Moscow, Russia: Academy.

Zagvyazinsky, 1995 – *Zagvyazinsky, V.* (1995). *Methodology and methods of socio-pedagogical research*. (in Russian). Moscow, Russia: ASOPIR.

Zetina Perez, 2017 – *Zetina Perez, Carlos David, Magana Medina, Deneb Eli, and Avendano Rodriguez, Karla Cristina*. "Teaching research competence: a challenge in educational management." *ATENAS*, March 2017.