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Development of Research Skills of Future Bachelors of Pedagogics in Studying the Basic Academic Disciplines

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Abstract

The Currently, research-based teacher education is intensively developing. Educational and research activities of students are implemented in the framework of academic disciplines and involve the formation of students ' necessary primary research skills. The aim of this work was development of primary research skills of junior students. We have analyzed normative documents and the contents of the academic disciplines in the curriculum for the bachelor of pedagogics with two profiles of training. The systematization and generalization of the experience of the Department of biomedical disciplines of Vyatka State University have been carried out. In accordance with Federal state educational standards of higher education in the bachelor training program, the research competence is a professional teacher's competence. However, the developers of the curriculums choose this competence only for certain academic disciplines, which are studied at the senior courses. There is a kind of two-year "gap" in the development of this competence. Subsequently, many senior students hardly master the methodology of writing term papers. Independent research activities are of both classroom and extracurricular organization. The research results are summarized in the form of essays, reports, presentations or abstracts at the final training conference. Thus, the introduction of research study elements into basic academic discipline develops the research competence of bachelors of Pedagogy.

Keywords: research competence; research activity; student; health-preservation.

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Introduction

At present, the goals and content of education have changed in the Russian education system, which has become personally and practice-oriented (Gorchakova, 2018). In accordance with several studies (Aleksanova G. & Aleksanova S., 2016; Valeeva & Zhelezovskaya, 2016; Stepanova, 2017; Vakulenko, 2017; Gorchakova, 2018; Novichikhina & Denisova, 2018; Yudenkova, Gorskaya, & Gubanihina, 2018) the main requirements of modern employers are the following:

- 1) The graduate must be ready to apply his knowledge in professional activities;
- 2) He must have good diligence and self-starter in the framework of official authority;
- 3) He must be able for teamwork;
- 4) He can adapt to changing conditions quickly;
- 5) He must have non-standard thinking;
- 6) He can analyze new information;
- 7) He can predict the results of his activities;
- 8) He must be able and ready for further training, etc.

Thus, the modern problem in education is to prepare a graduate who would be able to carry out the pedagogical process creatively (Lamanauskas & Augienė, 2015; Slepneva, 2017). The emphasis is on the forms and methods of teaching that encourage creative search thinking, activity, self-reliance and responsibility (Lamanauskas & Augienė, 2015, 2016; Gorchakova, 2018; Yudenkova et al., 2018; Zamkin, Parshina, & Miroshkin, 2018).

In this regard, research activity became an integral part of the educational process; the role of reproductive methods in education reduced and the importance of search-research methods, promoting cognitive activity of students, increased (Vakulenko, 2017; Kadyseva, Ermakova, Kozlovceva, & Gubanova, 2018; Yudenkova et al., 2018). Students should learn to get knowledge on their own and to be non-consumers of "ready" knowledge (Samsonova, 2017).

The student's research activity is a "many-sided socio-pedagogical phenomenon" (Gorchakova, 2018; Loiko, Romanov, Shaposhnikov, Kushnir N. V., & Kushnir A. V., 2017), which includes educational-research and scientific-research activities. Educational-research students' activities (ERSA) are implemented within the academic disciplines studying and involve the forming of primary scientific research skills of students. In this case, classes should have a problem orientation, which is not always implemented in universities (Gorchakova, 2018). The ERSA can be organized in different forms: laboratory and calculation-graphical works, reports preparation, literature abstracting for seminars and practical classes, individual assignments during educational practice and externship, etc. (Aleksanova G. & Aleksanova S., 2016; Kadyseva et al., 2018). Scientific research students' activities (SRSA) are organized in the form of student participation in scientific conferences, seminars, academic Olympiads, competitions, grants, papers on individual or group research projects, etc. (Martyushev, Sinogina, & Sheremetyeva, 2015; Aleksanova G. & Aleksanova S., 2016; Kadyseva et al., 2018; Yudenkova et al., 2018).

Most of the authors (Martyushev et al., 2015; Valeeva & Zhelezovskaya, 2016; Vakulenko, 2017; Vorobev & Murzaeva, 2017; Gorchakova, 2018; Yudenkova et al., 2018) consider it necessary to start research activities since the first years of study at the university, as it allows to develop basic research skills. Problem lectures, research laboratory classes, preparing reports on scientific problems, etc. provoke students' scientific interests; contribute to the development of their own judgments (Gorchakova, 2018; Martyushev et al., 2018; Yudenkova et al., 2018).

The modern students' weak motivation to conduct researches is noted by many authors (Lamanauskas & Augienė, 2015; Aleksanova G. & Aleksanova S., 2016; Garkin, Medvedeva, & Nazarova, 2017; Kochemasova & Ostapenko, 2017; Samsonova, 2017; Semenova & Kazakova, 2017; Sorikhina, 2017; Stromov & Sysoev, 2017; Martyushev et al., 2018). First of all, this is due to the low awareness of first-year students about SRSA's constitution and necessity (Sorikhina, 2017). Secondly, a weak organization of SRSA, lack of management and control of this activity unmotivate students to do science; it would adversely affect the effectiveness of student science in general (Aleksanova G. & Aleksanova S., 2016; Samsonova, 2017; Semenova & Kazakova, 2017). Stromov & Sysoev (2017) believe that the ability to further independent innovative professional activity depends on the SRSA organization and offer a level model of the SRSA organization, which provides for the creation and active work of the student scientific society/council.

Among other reasons negatively affecting the activity of students' involvement in research activities and reducing motivation, a number of authors (Schneider & Dimitryuk, 2017) note the lack of critical thinking as well as the so-called "clip thinking" of modern young people. And since the phenomenon of "clip thinking" has to be taken as a "natural phenomenon of the modern civilization process" (Pendikova, 2016, p. 54), we have to make adjustments to the research activities organization at the university. On the one hand, modern students do not have a complete picture of the world perception, as well as the ability to formulate the purpose and objectives of the work, to highlight the main problem, to summarize data from various sources of literature, to make tables and charts, etc. On the other hand, high speed of information processing, fluency and mobility of thinking, the predominance of visual information processing over semantic, a higher level of generalization of information and identification of meanings (Pendikova, 2016), requires the teacher and supervisor of the formation and implementation of new approaches to the organization of research activities.

To our opinion, it is important not only to teach students the theory and methodology of the discipline, but also to familiarize with the basics of basic scientific methodology, forms and methods of work with scientific literature, methods of registration of the results of research, as well as to develop the skills of pedagogical diagnostics, preparation of presentations, reports, etc. for training bachelors of Pedagogics.

In connection with the above, the aim of our work was the formation and development of primary research skills of students in studying the discipline "Age anatomy, physiology and hygiene".

Methodology

We have analyzed normative documents; in particular, we have carried out a comparative analysis of three generations of the Federal state educational standards of higher education in the relevant area of training bachelors (FSES HPE, 2011; FSES HE, 2015; FSES HE 3++, 2018). The professional standard "Teacher", educational programs of training of bachelors of pedagogical education (with two profiles of training) and the content of the academic discipline "Age anatomy, physiology and hygiene" for bachelors of pedagogical education (with two profiles of training) were analyzed. Also, a questionnaire survey of students was conducted. The experience of teachers in the Department of biomedical disciplines VyatSU was summarized.

The experimental work was carried out at VyatSU. The study was conducted in September-December 2018 and February-March 2019 in the natural conditions of the educational process. 137 students of 1st, 2nd, 3rd and 4 years of the Physical Culture and Sports Faculty of VyatSU Pedagogical

institute were questioned.

The study was conducted in three stages. At the first, preparatory, stage, the present state of the problem under investigation was analyzed in pedagogical theory and practice; normative documents were analyzed; a program of research methodology was developed; the content of the academic disciplines of the training curriculums of Bachelors was determined. At the second stage, forming and development of primary research skills in studying the academic discipline "Age anatomy, physiology and hygiene" and the questionnaire survey of students was carried out. The third and final stage included systematization, comprehension, and generalization of the research results, clarification of theoretical conclusions, processing and documenting of the obtained research results.

Result

The Comparison of Competences in Russian Federal Higher Education Standards

According to FSES HPE and FSES HE, the competence in the field of research activities belong to the group of professional, but in the FSES HE the wordings of competences have changed (Table 1). In particular, in connection with the introduction of Professional Standard Teacher (2013), the competence associated with the formation of bachelors of pedagogy ability to lead the educational and research activities of students (professional competence – PC-12) appeared in the FSES HE (Table 1).

The FSES HE 3++ (2018), unlike the previous ones, does not imply the readiness of the bachelor of Pedagogics to solve the problems of research professional activity. But it points to the need of including research work in educational practice (obtaining primary skills of research work) and externship. In this regard, the research competence is in the universal and general professional blocks of competences (Table 1).

FSES HPE, 2011	FSES HE, 2015	FSES HE 3++, 2018
<p>The Bachelor of Pedagogics is ready to use the systematized theoretical and practical knowledge for definition and the decision of research tasks in the field of education (PC-11).</p> <p>The Bachelor of Pedagogics is able to develop modern pedagogical technologies taking into account features of educational process, problems of education and development of the personality (PC-12).</p> <p>The Bachelor of Pedagogics is capable to use the main methods of scientific research in educational activity (PC-13).</p>	<p>The Bachelor of Pedagogics is ready to use the systematized theoretical and practical knowledge for statement and the solution of research problems in the field of education (PC-11).</p> <p>The Bachelor of Pedagogics is capable to direct educational and research activity of students (PC-12).</p>	<p>The Bachelor of Pedagogics is able to search, critical analysis and synthesis of information, to apply a systematic approach to solving problems (UC-1).</p> <p>The Bachelor of Pedagogics is able to carry out educational activities on the basis of special scientific knowledge (GPC-8).</p>

Table 1. *The wording of the competencies in the field of scientific research activities in accordance with Russian Federal state educational standards of higher education (at undergraduate level)*

FSES HPE – Federal state educational standard of higher professional education; FSES HE – Federal state educational standard of higher education; PC – professional competence, UC – universal competence, GPC – general professional competence

The analysis of bachelors' educational programs (with two profiles of training)

However, the developers of educational programs choose the research competences only for

individual academic disciplines ("professional" disciplines from the methodological and subject-content modules), often – from the group of disciplines chosen by the student, which are studied at the senior courses. In this regard, there is a kind of two-year "gap" in the forming and development of this competence. Therefore later many undergraduates hardly master the technique of writing term papers (identification of the problem, formulation of goals and objectives, analysis of scientific literature, etc.).

Studying the academic discipline “Scientific and methodological activities” helps to fill this “gap”. However, this discipline is not available in some curricula or is offered for studying only during the second year. From the organization of teaching this discipline depends a lot. Both teacher and students must understand the great value of this discipline for subsequent educational and research activities. Often teachers of this discipline shift responsibility on future supervisors of term and qualifying papers. It turns out that the student is unable not only to formulate the aim and objectives of the work, competently make a review of the literature but also just pick up the literature on the research topic.

The results of the questionnaire survey

In this paper, we will analyze the answers to only some crucial questions. According to the survey, many students, especially freshmen (87.5%), participate in no types of research activities (Table 2). The majority of 1st- and 3rd-year students (37.5% and 41.8% respectively) in general are ready to engage in research activities. Despite the fact that undergraduates have already wrote term papers, wrote papers with scientific supervisors and/or work on grants, they consider themselves unready to engage in science (54.5% of the 4th-year surveyed students). Students called high academic load (75% of the surveyed freshmen, about half of the 2nd- and 3rd-year students), low material security and the associated need to earn extra money (52% of 2nd year students), lack of technical equipment of VyatSU (54% of 4th year students) etc. as the reasons that prevent students’ improving the efficiency of their own research activities.

Questions and answer variants	Number (%) of responses			
	1 st -year (n=32)	2 nd -year (n=38)	3 rd -year (n=34)	4 th -year (n=33)
Do you have a desire to engage in SRSA in VyatSU?				
1) I firmly believe that I’m ready	0	1	5	
2) I believe that I’m ready in general.	3	5.8	.9	0
3) I think that currently, I’m not ready	7,5	2	4	1
4) Perhaps, in more senior years I will do researches.	1	6.3	1.8	8.2
5) I'm not ready	2,5	3	2	5
6) I find it difficult to answer.	1	1.6	3.5	4.5
	2,5	2	1	9
	2	1	1.8	.1
	5	1	1	9
	1	0.5	1.8	.1
	2,5	5	5	9
		.3	.9	.1
What kinds of research work have you personally participated?				

Questions and answer variants	Number (%) of responses			
	1 st -year (n=32)	2 nd -year (n=38)	3 rd -year (n=34)	4 th -year (n=33)
1) Competition of research and artistic and creative works of students	0	1	2	9
2) Students scientific-practical conference	0	5.8	3.5	.1
3) Students' Olympiad	1	0	0	1
4) Exhibition of scientific-research and artistic and creative works of students	2.5	1	1	8.2
5) Working on the grant	0	5.8	7.6	1
6) Writing a scientific paper	0	0	0	8.2
7) Not engaged	0	1	0	0
	8	0.5	4	2
	7.5	1	7	7.3
		0.5	3	1
		5	5.3	8.2
		2.6		2
				7.3
In your opinion, when should you start to engage in the scientific activity?				
1) Since the 1 st year	1	3	3	9
2) Since the 2 nd year	2.5	1.6	5.3	.1
3) Since the 3 rd year	2	4	1	5
4) Since the 4 th year	5	2.1	1.8	4.5
5) I find it difficult to answer	3	2	1	9
	7.5	1	7.6	.1
	2	5	1	0
	5	.3	1.8	9
	0	5	2	.1
		.3	3.5	
What prevents students to improve the effectiveness of their own research?*				
1) High academic load	7	5	5	2
2) Low scholarship and the need to earn extra money	5	2.6	2.9	7.3
3) No working conditions at home	0	5	3	0
4) Lack of technical equipment in VyatSU	0	2.6	5.3	9
5) Lack of instruments, materials	0	5	1	.1
6) Inability to visit scientific conferences	0	.3	1.8	5
7) High fees for scientific publications	1	5	0	4.5
8) Lack of a supervisor interested in the topic	2.5	.3	0	9
9) Not enough literature in VyatSU library	0	5	5	.1

Questions and answer variants	Number (%) of responses			
	1 st -year (n=32)	2 nd -year (n=38)	3 rd -year (n=34)	4 th -year (n=33)
10) I find it difficult to answer	0	.3	.9	.9
11) Nothing prevents	1	1	0	.1
	2.5	0.5	5	1
	1	0	.9	8.2
	2.5	1	0	0
	1	0.5	2	0
	2.5	5	3.5	1
		.3	0	8.2
		1		9
		5.8		.1
		1		
		0.5		
In your opinion, what role does SRSA play in future specialists training in VyatSU at present?				
1) The most significant role.	2	1	0	0
2) Quite a significant role.	5	0.5	5	9
3) The role is not enough.	3	3	2.9	0.9
4) Virtually no role.	7.5	6.8	1	0
5) I find it difficult to answer.	1	2	1.8	0
	2.5	1	0	9
	0	0	3	.1
	2	3	5.3	
	5	1.6		
What should the teacher pay attention to in the classroom primarily?*				
1) To provide knowledge and to control their uptake	8	6	6	8
2) To develop students' creativity	7.5	8.4	4.7	1.8
3) To develop scientific thinking	3	3	1	2
4) To foster communication	7.5	1.6	7.6	7.3
5) To educate the ability to conduct a scientific dispute	7	2	1	2
	5	1	7.6	7.3
6) To form the skills of scientific research	1	2	2	6
7) To educate self-reliance in knowledge searching	2.5	1	3.5	3.4
8) I find it difficult to answer	0	2	1	9
	1	1	1.8	.1
	2.5	2	1	2
		1	1.8	7.3

Questions and answer variants	Number (%) of responses			
	1 st -year (n=32)	2 nd -year (n=38)	3 rd -year (n=34)	4 th -year (n=33)
	0	0	2	4
	6.3	7	5	6.4
	.3		0	0
How can the teacher form students' desire to engage in the classroom ERSA?				
1) To give as many abstracts as possible	1	1	5	0
2) To hold special seminars on certain topics	2.5	5.8	.9	0
3) To hold scientific conferences on the studied discipline	3	2	1	9
4) To involve in the work on their own scientific research	7.5	6.3	7.6	.1
5) To prepare scientific co-publications	2	2	4	2
6) I find it difficult to answer	5	6.6	7	7.3
	0	3	1	4
	3	1.6	7.6	5.5
	7.5	2	2	1
	1	6.3	9.4	8.2
	2.5	1	0	
		5.8		
What is not enough for VyatSU students for full-fledged scientific activities?				
1) no interest in science	5	5	4	7
2) there are not enough scientific supervisors willing to work with students	0	7.9	7	2.7
3) lack of skills for science	0	5	0	0
4) there is a lack of awareness of students about the possibilities of SRSA	2	.3	4	3
5) Lack of materials, devices, equipment	5	1	7	6.4
6) the library of VyatSU hasn't enough necessary literature	1	5.8	1	3
7) there is no opportunity to participate in scientific conferences	2.5	3	1.8	6.4
8) low prestige of science in Russian society	0	1.6	5	.9
9) low salaries of scientists	0	.3		0
10) there is no value of scientific activity in the student's family	0	0		0
11) I find it difficult to answer	1		5	9
	2.5	5	.9	.1

Questions and answer variants	Number (%) of responses			
	1 st -year (n=32)	2 nd -year (n=38)	3 rd -year (n=34)	4 th -year (n=33)
	0	.3	5	9
		1	.8	.1
	0	0.3	0	
	5	1		9
0		0.3	1	.1
			1.8	0
		2	3	
		6.3	5.3	
		2		
		6.3		

Table 2. Some results of the questionnaire survey of students of the faculty of physical culture and sports on the organization of research work in Vyatka State University

* Students can choose from 1 to 3 options to answer those questions; ERSA – educational research students’ activities; SRSA – scientific research students’ activities.

The students’ opinions about the time of starting the SRSA differ greatly (Table 2). In particular, many first-year students consider the best time to start SRSA on the 3rd year of studying at the University. Second- and fourth-year students believe that it is necessary to start with the second year of studying. According to third-year students, it is necessary to start doing science from the first year.

Most of our students believe that SRSA assigned a significant role in the training of specialists. However, there is a lack of awareness of students about the possibilities of SRSA (38% of respondents), students have no interest in research, as well as skills for science (more than half of the respondents); all this prevent the full-fledged scientific activities in the VyatSU.

The ERSA’s is undervalued by many students. To students opinion, the main task of the teacher is to supply and control knowledge. About a third of respondents noted the need to develop scientific thinking and to educate the self-reliance in knowledge searching. The method of forming research skills in the classroom is also misunderstood by students. The teacher has to write a scientific paper jointly with the students (the third of respondents with first-, second- and third-years, 45% - 4th-year) or to organize an educational scientific conference (47% of the third-year students) or to involve students in his own scientific research (a third of respondents from second- and fourth-years) for the forming of a desire to engage in research activity.

The forming of primary research skills in studying "Age anatomy, physiology, and hygiene"

To our opinion, the inclusion of research elements in the studying of basic academic disciplines can solve those problems. Thus, the academic discipline "Age anatomy, physiology and hygiene" is mandatory for future bachelors of Pedagogics. It is studied during the first semester in the first year and included in the training module "Health-preservation". The academic discipline "Age Anatomy, Physiology, and Hygiene" serves as a ground for the psychological-pedagogical ("Age Psychology", "Pedagogics" etc.) and medical-biological ("Basic Medical Training and Healthy Life Style", "Health and Safety" etc.) disciplines as well as for some particular educational methods.

Students learn anatomy, morphology, and physiology of a human organism and its age peculiarities, methods of assessing the state of the main human functional systems (nervous, sensory, locomotor, etc.), ways of keeping them healthy and working, hygiene requirements to the teaching process, prevention techniques against the most typical health problems which one could get during the period of education. Skills of providing first aid in cases of injuries and critical conditions, in our opinion, are a sign of the teacher's high qualification. During the laboratory exercises, skills and abilities for first aid in bleeding, wounds and other injuries, in cardiovascular, allergic, psycho-neurological and other urgent conditions are developed. In general, students obtain knowledge and form skills to organize the educational process taking into account age anatomical and physiological characteristics of the body and sanitary and hygienic requirements in studying this discipline.

The independent research activity of students in studying the above discipline is organized both in the classroom and out-of-class. In laboratory classes, students learn to study man's anthropometric and functional parameters, to analyze them, make recommendations for the preservation and promotion of health. They also conduct a hygienic assessment of the timetable, the study room and its equipment, motor activity and daily diet; a conclusion is drawn upon their compliance with sanitary requirements.

Extracurricular activities include, for example, the preparation of a "health passport" and recommendations based on the measured indicators (pulse rate, blood pressure, lung capacity, weight-growth index, the value of breath holding, recovery time after exercise, etc.), the preparation of an "ideal" timetable and diet; conducting a hygienic assessment of the student's home workplace, as well as the school building and adjacent land, and drawing up a conclusion about their compliance with sanitary and hygienic requirements.

The research results are summarized in the form of essays, reports, presentations, abstracts and recommendations at the final lesson, which is held in the form of an educational conference. A prerequisite for the work is the scientific literature review (at least 10-15 sources over the past 5 years).

Conclusion

It is noted that there is a lack of exhaustive research studies about forming and developing students' scientific research competence in the educational process (Lamanauskas & Augienė, 2015). Forming of scientific activity skills is one of the most important features of high-class specialists' training. The effective research activities organization at the University is associated with certain difficulties. To our opinion the reasons for this phenomenon are the following:

- 1) There is a lack of students' interest in conducting scientific research due to low awareness of students about the prospects of scientific activity.
- 2) The inefficient educational work of the student scientific society/council: they do not inform the students about the prospects SRSA in time.
- 3) Curators / Tutors of first-year students do not motivate students to permanent work with the University website, including the information posted there about the SRSA.
- 4) The university administration weakly encourages students to active participation in SRSA.
- 5) Teachers pay no attention to the forming of primary research skills in studying of basic disciplines.

Encouragement, especially material, can be quite a powerful motivation for modern students to participate in researches. This is stated by many researchers, citing examples of different types of material

incentives: allowances for scholarships, lump-sum material payments for achievements in scientific activity, benefits for tuition fees for students studying on a commercial basis (Vostroknutov, 2016). As moral methods of encouragement letters inclusion of their surnames as co-performers in scientific reports (Astaniina, Shestak, & Chmyhova, 2012) are mentioned. A portfolio of scientific achievements creation helps students to receive a financial reward (Vostroknutov, 2016). Much attention should be paid to information, material and technical support of SRSA, including replenishment of library funds, organization of co-publications, reports at scientific conferences, participation in competitions, development, and inventions officially registered as intellectual property of students (Astaniina et al., 2012; Lamanuskas & Augienė, 2015).

Thus, the introduction of elements of research activities in the development of the basic discipline contributes to the development of research competence of bachelors of pedagogy, the formation of critical thinking in the field of health, the ability to choose the best ways to solve problems, based on available resources and constraints.

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