

Methodological Support Improvement as Condition for Students' Competences Development



Sirotyk S. D., Vaganova O. I., Smirnova, Z.V, Kaznacheeva S.N., Prokhorov M. P., Chelnokova E.N., Mironov A. G.

Abstract: *Methodical support is an integral part of educational process. Under the conditions of reforming Russian educational system, its updating becomes an objective necessity. Teachers' methodological activity as a whole acquires new features and needs improvement which is of particular interest to researchers, thus actualizing the need to consider this issue. In this article the authors reveal the essence of teachers' methodological activities considering importance of this process both for teachers and for students. Since methodological activity in educational framework acquires new meaning, additional development in this area is required to form methodological support at a high level. Therefore, the purpose of the article is to improve methodological support to perfect students' competencies development. The authors proposed updated methodological support in the courses of general professional cycle. To test effectiveness of the proposed development the authors conducted a study. Improvement of methodological support in the framework of updated educational process contributed to improvement of students' competencies development. The obtained results confirmed effectiveness of updated methodological support in the courses of general professional cycle.*

Keywords : *methodological activity, methodological provision, students, competences, methodological recommendations.*

I. INTRODUCTION

Methodological activity is the activity of a teacher in the development and improvement of methodology for teaching a course,

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* Correspondence Author

Сиротюк С. Д.*, Federal State Budget Educational Institution of Higher Education «Togliatti State University» Email: sirotyk_sd@mail.ru

Vaganova O. I. Minin Nizhny Novgorod State Pedagogical University, Nizhny Novgorod, Russian Federation, Email: vaganova_o@rambler.ru

Smirnova, Z.V. Minin Nizhny Novgorod State Pedagogical University, Nizhny Novgorod, Russian Federation, Email: z.v.smirnova@mininuniver.ru

Kaznacheeva S.N. Minin Nizhny Novgorod State Pedagogical University, Nizhny Novgorod, Russian Federation Email: cnkaznacheeva@gmail.com

Prokhorov M. P Minin Nizhny Novgorod State Pedagogical University, Nizhny Novgorod, Russian Federation Email: prohorova_mp@mininuniver.ru

Chelnokova E.N. Minin Nizhny Novgorod State Pedagogical University, Nizhny Novgorod, Russian Federation Email: chelnokova_ea@mininuniver.ru

Mironov A. G. Krasnoyarsk State Agrarian University Email: lexamir13@mail.ru

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that is, it is a set of skills with clearly defined specificity in the structure of professional pedagogical activity (Kutepov et al, 2017). The objectives of methodological activity are the development of the most rational methods and methods of teaching and educating students; increasing the level of general pedagogical and methodological teachers' personal style and organizational forms that affect formation of personality and implementation of educational process (Ilyashenko et al, 2018). Goals express the content and subject-semantic orientation (Smirnova et al, 2017). They denote target characteristics of educational concepts and technologies that the teacher uses in practice (Ilyashenko et al, 2018). Individual methodical style is expressed in characteristics of teacher's activities, which manifest themselves in the context of any teacher's content, motives and characteristics (Smirnova et al, 2018) as well as organizational forms, methods and means (Ilyashenko et al, 2018). This component is expressed in the ability to find optimal combination of forms, methods and means in different learning environments (Manikandan et al, 2018). Methodical activities contribute to the development of each teacher and entire teaching staff skills (Barber et al, 2013). All methodological activities can be divided into two components: educational and methodical work; scientific and methodological activities (Smirnova et al, 2018) as well as educational and methodological activities (Tsyplakova et al, 2016). Its goal is to study and develop pedagogical experience, teaching staff professional development, mentoring support for young professionals, improving the effectiveness of used methods and means of teaching (Abramova et al, 2018) and scientific and methodological activities (Vaganova et al, 2018). It includes study, analysis, development of advanced pedagogical experience and innovative technologies, their introduction into educational practice of an average professional educational institution (in process of experimental activity), publication of printed works for internal and external use, organization of scientific and practical conferences and seminars for teaching staff and students (Vaganova et al., 2019). The following functions of methodical activity are distinguished (Aygul et al, 2018). The epistemological function displays description and explanation of pedagogical phenomena and processes (Vaganova et al, 2017): namely, the study of certain learning technologies and understanding pedagogical potential for existing methods of solving problems (Ajeenkya et al, 2014). The design function is to plan ahead and design learning content,

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prepare learning activities (Bicheva, 2017) and also determining the most effective methodological techniques for solving educational and cognitive tasks (Lubov et al, 2019). Reflexive one is expressed in the analysis of one's activity, that is, in assessment of one's own characteristics, in ability to see one's own strengths and weaknesses (Braine et al, 2013). Regulatory function contributes to compliance with educational standards requirements, curricula and conditions for implementation into educational process (Markova et al, 2018). In the process of studying vocational training methods, future teachers acquire only basic methodological skills (Pavlov et al, 2016). The whole system of methodological activity is formed and improved in the process of teachers' practical activity (Perova et al, 2017). The development of learning activities occurs through methodological skills development (Vaganova et al, 2017). The higher the level of pedagogical methodical activity is, the higher the level of students readiness for professional activity is, the better his competences development is (Natalie et al, 2019).

II. METHODOLOGY

In 2017, the authors analyzed methodological support in courses of general professional cycle of the major "Construction and maintenance of buildings and structures", after which in 2018 it was decided that it was necessary to update it in order to improve students' competencies development (Lubov et al, 2018). Methodological recommendations for students' practical work at Nizhny Novgorod Construction College have become part of the updated methodological support. To identify the impact of the updates, the authors conducted a study. Student achievements in the courses of general professional cycle in 2017 and in 2018 were under analysis. It was recorded that in 2018 percentage of positive assessments increased significantly.

2.1. The result of the study to update methodological support

In order to carry out their job responsibilities at a high level in future, future builders should master the basics of their professional field of activity. First of all, they need to master the development of architectural and construction drawing skills. Therefore, in the article we provide updated guidelines for the course "Engineering Graphics" at Nizhny Novgorod Construction College. The guidelines contain recommendations and tasks for practical work implementation. We have proposed instructions for several practical tasks. Each instruction contains name, purpose of work, task for work, and also the order of its implementation. Table 1 presents all the topics in which guidelines development was made.

Table 1. List of practical tasks with the number of hours to complete the work

No	Job title	Number of hours to complete the work
1	Drawing fonts	2
2	Conjugation and Dimensioning	2
3	Building a comprehensive drawing of models in a visual image	2
4	Construction of the third projection of the part according to two given projections and their axonometric projection	2
5	The construction of three images on two given and the implementation of simple cuts. Building an isometric view of the part	4

	with a quarter cut.	
6	Construction of three types of parts for two given with the execution of a stepped section.	4
7	Drawing of the section of the basement of a residential house	4
8	Floor Plan	8

Next, we present detailed guidelines for some practical assignments. Title of work: Drawing fonts. Objective: Acquisition of skills in writing letters and numbers in a drawing font in accordance with the requirements of GOST 2.304-81; Task: On an A4 sheet of paper, make a drawing font. All letters and numbers must be handwritten. The task is performed in one version. Methodological instructions: a font is an outline of alphabet letters, numbers and signs. Requirements for the font: must be clearly executed, clear and easy to read, all signs and letters must be neat (Ilyashenko et al, 2018). For high-quality execution of the inscriptions it is necessary: to build an auxiliary grid (Figure 1); maintain individual elements of the font sequence: if there are rounds in a letter, then first draw them, and then smoothly connect the rounds with straight lines; maintain a uniform spacing between letters and equal spaces between words. Most often in engineering graphics fonts are used with the following sizes: 10; 7; five; 3.5 millimeters. When writing a drawing font, you should be guided by the following rules: The height of letters, numbers and symbols in a drawing should be at least 3.5 millimeters. Perform letters and numbers in parts (Bulaeva et al, 2018). The movement of the hand when drawing rectilinear elements of letters will be executed from top to bottom or from left to right, and rounded - by moving down and to the left or down and to the right. Similar elements of various letters, numbers and signs must be performed in the same way in order to develop automatic skills. It is necessary to withstand the initially defined slope of the font using the grid (Smirnova et al, 2017). There must be strict adherence to the design of each letter and ratio of height and width of the letter. It is necessary to maintain the distance between the letters so that visually they look the same. It is important to make a high-quality drawing in order to make it easy to read, so that it appears clear and precise. Be sure to draw letters and numbers carefully.

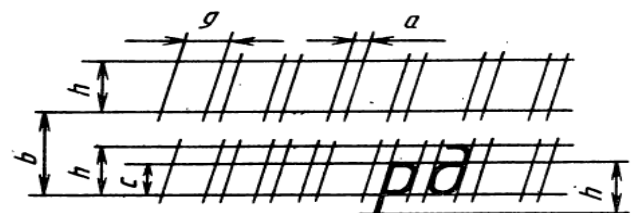


Figure 1. Auxiliary grid

The following practical work is "Conjugation of two straight arcs of a circle of a given radius, arcs with arcs and arcs with a straight line". Objective: to study methods of constructing mates, acquire skills in performing geometric constructions, continue to consolidate skills in working with drawing tools and drawing design; familiarize yourself with the rules for building a smooth transition from one line to another; learn to develop spatial imagination, logical thinking. Task: Perform the task "Conjugation" on an A4 sheet.

The teacher gives the options of tasks. Guidelines: The drawing is carried out in the following sequence: Prepare the format of A4 paper, draw the outer and inner frames of the drawing and allocate space for the main inscription and additional columns. Image scale should be 1: 1. We carry out axial and center lines. The distance between them is taken according to part dimensions, it is also necessary to take into account the distribution of the image in the drawing field. We draw arcs of circles, circles and straight lines whose positions are determined by given dimensions and it does not require additional constructions (Arkhipova, et al 2018). Perform geometric constructions and mates. Preliminary constructions should be made with thin lines with a solid pencil (T or 2T). We apply external and dimension lines, we write dimensional numbers in the fifth font. It is necessary to check whether the drawing is correctly made before drawing a pencil with a TM or M. First, we draw an arc of circles and circles and then we draw a straight line. Outline the inner frame of the drawing. Dimensioning: in construction drawings, dimensions are applied in accordance with GOST 2.307-68 * and taking into account the requirements of GOST 21.101-97. Dimensions are applied in the form of a closed circuit without indicating measurement units. Dimensional lines in construction drawings are limited by serifs - short strokes 2-4 millimeters long, which are held with a slope to the right at an angle of 45° to the dimension line. Dimensional lines stand for 1-3 mm extremal extension lines. The dimension number is placed above the dimension line at a distance of 1 millimeter. The extension line stands for dimensional at 1-5 millimeters. The distance from the outline of the drawing to the first dimension line should be at least 10 millimeters. The distance between parallel dimension lines should be at least 7 millimeters, and from the dimension line to the level of the coordination axis - 4 millimeters. When specifying diameter, radius of a circle or angle, the dimension line in construction drawings is limited by arrows (Figure 2).



Figure 2. Dimensioning

Recommendations developed by us for each assignment detail the procedure and take into account many issues that may arise in work course. They are the basis for the development of student autonomy and as a result of its creative component development which will help increase his competitiveness in labor market in future. In addition, we posted general guidelines on how students perform practical work in e-course of the subject under consideration. Access to them for students was open around the clock and they could test their knowledge at any time and fill in the gaps by contacting the resource. In order to identify the updated methodological support effectiveness, we conducted a study. We analyzed the test records of students enrolled in the major "Construction and maintenance of buildings and structures" in 2017 and in 2018. The results are shown in chart 1.

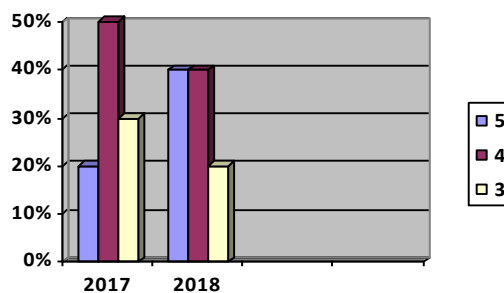


Chart 1. The results of students' grades analysis in the course of general professional cycle in 2017 and in 2018.

In 2017, 20% of students had rating of '5' – "excellent"; 50% of students had rating of '4' – "good"; 30% of students had rating of '3' – "satisfactory". The results of test analysis of records in 2018 were significantly higher: excellent grades for 40% of students, good grades also for 40% of students and satisfactory grades have only 20% of students. After updating methodological support, we were able to record increase in the level of competencies development.

As we can see, in the second group the percentage of satisfactory grades is significantly lower than in the first group. From this it should be concluded that recommendations we have introduced have positive effect.

III. RESULTS

After analyzing methodological support in 2017, we decided on the need to improve it in 2018. It was proposed to update methodological support in the courses of general professional cycle of the major "Construction and maintenance of buildings and structures". Since it is extremely important for students to master the basics of professional activity, we focused on students' competence "Development of architectural and construction drawings" development in the article. Therefore, the article reflects the guidelines for practical work in the course "Engineering Graphics".

After analyzing the statements for 2017-2018, we determined that the percentage of high grades increased significantly in 2018. The percentage of excellent grades rose from 20% to 40%. Students have improved their performance since the updated methodological support was introduced. We can say that this update affects students' competencies development. That is, methodological support is an essential condition for competencies development.

IV. SUBCHAPTER

The study showed that methodological support is one of the conditions for increasing the level of students' training and more efficient development of necessary competencies.

V. CONCLUSIONS

The goal of this work to improve methodological support and students' competencies development was achieved. The use of updated teaching materials in educational process should be developed.

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Thus, we will improve the process of technical school students' professional competencies development.

VI. SUBCHAPTER

Since the results of the updates turned out to be positive, we can talk about the need to continue to improve methodological support in educational process at Nizhny Novgorod Construction College.

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AUTHORS PROFILE

Sirotyk Svetlana Dmitrievna, Candidate of Pedagogical Sciences, Department of Undergraduate (Economic and Management Programs) Federal State Budget Educational Institution of Higher Education «Togliatti State University»
Russia, 445020, Samara region, Tolyatti, st. Belarusian, house 14
E-mail: sirotyk_sd@mail.ru
<https://orcid.org/0000-0003-4256-4982>

Vaganova Olga Igorevna, Candidate of Pedagogical Sciences, Associate Professor of the Department of Vocational Education and Management of Educational Institutions, Minin Nizhny Novgorod State Pedagogical University, Nizhny Novgorod, Russian Federation. Research Interests: Designing the content of vocational training. The implementation of modern educational technologies in the educational process.



Education: Volga State Engineering and Pedagogical Institute, specialty "Vocational training", 2000.

Professional development: Project management and fundraising in research and innovation and innovative activities of the university Moscow, Russian State Social University 2012 ..

Advanced training: The use of information and communication technologies in professional activities (Internet technology module for interactive interaction in e-learning), Nizhny Novgorod, 2015 Theme of the dissertation research: Methods for estimating the amount of educational material to be memorized in the course of mathematics in secondary schools.

Smirnova Zhanna Venediktovna, candidate of pedagogical sciences, associate professor of the department of service technologies and technological education, Minin Nizhny Novgorod State Pedagogical University, Nizhny Novgorod, Russian Federation.

Scientific interests: development of the content of vocational training. The introduction of modern educational technologies in the educational process.

Education: Nizhny Novgorod State Pedagogical University, 2007

Professional development: project management and fundraising in the scientific and innovative and innovative activities of the university. Moscow, Russian State Social University 2012 ,

Further training: the use of information and communication technologies in professional activities (Internet technology module for interactive interaction in e-learning), Nizhny Novgorod, 2018 Thesis: The preparation of a master of professional education in the structure of an engineering and pedagogical university

Kaznacheeva Svetlana Nikolaevna, candidate of pedagogical sciences, associate professor of the Department of Innovative Management Technologies of the Minin Nizhny Novgorod State Pedagogical University, Nizhny Novgorod, Russian Federation

Research interests: development of cognitive activity, personnel management, marketing

Education: Nizhny Novgorod Commercial Institute; Commerce; 1998 year
Professional development: Development of cognitive activity of university students
Further training: advanced training in the program "Project Management in the Educational Activities of the University", NGPU named after K. Minin, 2014, advanced training in the program "Psychology and Pedagogy of Higher Education". NGPU named after K. Minin, 2015. advanced training program "Pedagogy and Psychology of Potential Opportunities for Persons with Disabilities and Higher Disabilities at the University", NGPU named after K. Minin, 2018 advanced training on the program "Innovative Management Technologies" , NGPU named after K. Minin, 2018.

Prokhorova Maria Petrovna, Candidate of Pedagogical Sciences, Associate Professor, Department of Innovative Management Technologies, Nizhny Novgorod State Pedagogical University named after Kozma Minin.

Research interests: Innovative processes in vocational education Innovative training of teachers Management of innovative activities in vocational education Education: VGIPU, Vocational Training (Economics and Management), 2006 Professional Development: Training Professional Education Teachers for Innovation Activities at the University

Further training: 2008 - additional professional education, program "Business Administration of Innovation Projects", GOU DPO Nizhny Novgorod Research and Information Center

2012 - advanced training, the program "Information Technologies in the Management of the Quality of Education", FSBEI HPE NGPU im. K. Minina.

Chelnokova Elena Nikolaevna, Candidate of Pedagogical Sciences, Associate Professor, Department of Innovative Management Technologies, Minin Nizhny Novgorod State Pedagogical University, Nizhny Novgorod, Russian Federation. Scientific interests: tutoring Education: BSPI (Biysk State Pedagogical Institute), Faculty of Philology, 1986. Professional development: Communications in management, Professional ethics and etiquette, an introduction to professional management activities Marketing services. Further training: Program "The use of ICT in professional activities". NGPU, 2016 Additional professional program "Innovative Management Technologies". NGPU them. K. Minina, 2018. Additional professional program "Pedagogy and Psychology of Potential Opportunities for Persons with Disabilities and Disabilities at the University". NGPU them. K. Minina, 2018.

Mironov Aleksei Gennadievich (Krasnoyarsk, Russia), Mironov A.G. Associate Professor of the Department of Psychology, Education and Human Ecology, candidate of Agricultural Sciences, docent

Krasnoyarsk state agrarian university e-mail: lexamir13@mail.ru
SPIN-code: 9873-0365, AuthorID: 236213 ORCID ID 0000-0003-4076-493X