

TASKS AIMED AT FORMING AND DEVELOPING THE REFLEXIVE COMPONENT OF CREATIVE COMPETENCE IN CREATIVITY BASED SPECIAL TASKS

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Abstract. *This article analyzes the tasks aimed at the formation and development of the reflexive component of creative competence in creativity based special tasks.*

Keywords: *creativity, creative ability, creative personality, creative potential, creative competence, creativity-based tasks.*

Introduction. The tasks of this group are aimed at objective self-assessment by students of the degree of formation of their creative competencies, as well as the application of the acquired knowledge in their professional activities.

In our opinion, the reflexive stage is mandatory in the implementation of any activity. Thus, all tasks of the CBMT described above are more or less aimed at forming the creative competence of future teachers. At the same time, the following questions to the tasks are important:

- What creative features of the person helped to solve the task? Which one do you think should be promoted?
- Which elements of creative activity did you implement during the task?
- What did you learn about creativity-based mathematical tasks (CBMT)?
- What difficulties did you face while performing the task? How can they be described?
- What solution do you offer to the pedagogical situation? and so on.

It should be noted that reflection can be done in oral and written form. T.V.Dmitrieva and N. E. Sedova distinguishes the following forms of written reflection in teaching mathematics: "abstracting, reviewing, explaining, reflexive work on mistakes, structuring educational material, making references, testing and self-testing, etc" [2].

Also, various reflexive technologies can be used to implement reflex: "reflexive circle", "reflexive goal", "key word", "wish chain", etc.

It should be noted that the use of creativity-based tasks described above as a means of forming the creative competence of future primary school teachers should correspond to certain stages of work on the task [1].

Since we are talking about mathematical tasks, these steps are correlated with the stages of work on mathematical problems (including non-standard ones) emphasized by D. Poya, L.M. Friedman, as well as with the stages of work on competence-based tasks. At the same time, creativity-based mathematical work with the content of the stages has certain specificity:

1. Preliminary analysis of the task. Future elementary school teachers will familiarize with the situation of CBMT, determine the relevance of implementing CBMT, carry out goal setting, put a mathematical question to the problem, and also determine whether traditional or creative methods are required to solve the task.

2. Search for the problem. Students identify contradictions in the process of the task, identify new problems in the proposed conditions, and thereby determine what includes the non-

standard nature of the task. The teacher can give advice that organizes the updating of the necessary mathematical knowledge with the help of additional questions.

3. Creating a mathematical model. Solving a mathematical task. At this stage, future elementary school teachers perform the following elements of creative activity: creating ideas, searching for a solution to a problem in a non-standard situation "in the form of science", transferring existing knowledge to a new situation, creating a creative educational product, etc.

4. Analysis of the obtained results. Pupils interpret the results of solving a mathematical task, find that it satisfies the CBMT condition, and formulate an answer. The teacher monitors the correctness of the students' answers and, in case of an incorrect answer, recommends returning to the previous stages of CBMT implementation.

5. Final discussion. At this stage, reflection is organized: the degree of involvement of each student in the process of working in CBMT, the originality of the proposed ideas, the transfer of existing mathematical knowledge to a radically new situation, and others are evaluated. Within the framework of the group discussion, the importance of the future teacher's creative competence is determined.

Note that the completeness of the implementation of these steps depends on the type of CBMT. For example, work on tasks aimed at forming the cognitive and motivational component of the creative competence of future elementary school teachers can be limited only with the first and second stages. Tasks aimed at forming the activity component of this authority provide for the implementation of all the described stages.

We will view an example of organizing work at CBST within the framework of training future primary school teachers on the topic "Elements of Mathematical Statistics" (the subject of "Higher Mathematics"). This topic is the final topic of the course, so students are already familiar with creative ways to solve mathematical problems and have experience in implementing most elements of creative activities.

The following competence is aimed at the development of the component of the activity of creative competence of future elementary school teachers and allows solving the following problem: formation of students' skills in applying the existing mathematical knowledge in the section "elements of mathematical statistics" to process primary experimental data in non-standard conditions.

Expected results are: development of students' ability to transfer mathematical knowledge (subject of "elements of mathematical statistics") to new (professional) situations; development of the activity component of the creative competence of future elementary school teachers, as well as to encourage students to perform creative mathematical activities in the scope of future professional activities.

Task Description:

In the performance rating of students of the academic group, the following points were recorded (negative points were given to students with academic debts): -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5.

a) Is it possible to replace one number with two other integers so that the measure of dispersion of student scores with respect to the expected rating and average rating is unchanged?

b) Suggest a topic for statistical research in your academic group. Process the primary statistical data. Is it possible to permute any data without changing the measures of central tendency and relative expected value of the characteristic dispersion?

Show. The implementation of clause b) includes the students' independent work during the week (until the next lesson).

Organization of execution of CBST.

Step 1. During the initial analysis of the task, students should determine that there is no direct instruction about what mathematical knowledge to apply. Thus, the task is not traditional. To complete the task, students must first formulate a question in the language of mathematics. For example: "is it possible to replace one number with two other integers so that the average value and desperation of the rating do not change?". If the students find it difficult to ask a "mathematical" question, the student asks additional questions: "What measures of the distribution of a series of statistical data do you know? What measure characterizes the average value of the series?". It should be noted that students can propose another goal for this task: "developing skills to implement elements of creative activity in solving non-standard tasks on the topic of "elements of mathematical statistics".

At this stage of work at CBST, we consider that it is necessary to draw students' attention to the fact that creative mathematical activity allows them to answer non-standard questions about experimental data and their properties.

Step 2. During the group discussion, the need to replace one number with two other numbers is determined so that the arithmetic average and the average square of the rating do not change. This allows us to reformulate the problem and use the transition state method, a creative method of mathematical problem solving.

Step 3. In order to complete the clause a), students are divided into groups (no more than 5 people in each group). In each of them, a student is selected who evaluates the work of group members without participating in it.

Then each group starts making ideas (brainstorming is organized), the purpose of which is to create a mathematical model and solve a mathematical problem.

Future elementary school teachers can be offered the following solution: «the average arithmetic of this set is 0, so the average arithmetic of the new set should also be 0. There are 11 numbers in this set and the sum of the squares is 110, so the average square is 10, there are 12 numbers in the new set, so the sum of the squares of the numbers in the new set should be 120, which increases by 10. Then $a = b + c$ and $a^2 + 10 = b^2 + c^2$. So, $b^2 + c^2 - 10 = (b + c)^2 = b^2 + c^2 + 2bc$ here $bc = -5$. So, one of the numbers is equal to 5 or -5, and the other is equal to -1 or 1, respectively. In the first situation $a = 4$, in the second situation $a = -4$ ».

It should be noted that students can propose other options for constructing a mathematical model for solving the considered CBST, and the possibility of obtaining the correct answer by the selection method is not excluded.

Step 4. Groups present their mathematical models and solutions to structured mathematical problems and interpret the results obtained: -4 can be replaced by 1 and -5 or 4 by -1 and 5 in order to preserve the measure of the spread of the rating and the average rating of the students.

Step 5. The final discussion will be held by the students after the presentation of the results of the statistical research of the academic group. Reflection is organized using the "full phrase" technology. Each of the students is offered several phrases:

- I will describe the current work at CBST as follows. . .
- I consider it useful (useless) to perform such tasks because...
- I was interested (not interested) in working on CBST because . . .

- I evaluate my activity in solving CBST as follows. . .

- While working on CBST, I implemented the following elements of creative activity. . .

The evaluation of the presented CBST is carried out according to the following scale: the student did not actively participate in the group work while completing the clause a) and did not start to complete the clause b) 2 points; as part of the group work, the student did not create ideas, but participated in their implementation, clause b) was not fulfilled 3 points; the student actively participated in the group work in the implementation of clause a), clause b) is fulfilled, but the idea of statistical research in this clause is similar to clause a) 4 points; student actively participated in the groupwork, created original ideas during "brainstorming", proposed an original idea of statistical research while completing clause b) and an original mathematical model different from the one created in clause a) 5 points.

In our opinion, work on this task helps to develop not only an activity component of the creative competence of future elementary school teachers, but also a motivational (lack of non-standard and direct instructions encourages students to perform creative activities) and the reflexive components (methods of discussion are proposed by students to solve the problem, their originality is evaluated, it realizes the reflex of the creative activity carried out).

We believe that the regular use of the described set of creative based tasks ensures the formation and development of separate components of creative competence and the entire competence of future elementary school teachers.

Thus, in this article, based on a comprehensive approach, the main groups of goals for the formation of the creative competence of the future elementary school teacher are formed. The concept of "Creative based special tasks (CBST)" was introduced. The principles of CBST development are emphasized, taking into account the implementation of CBST classification. Examples of CBSTs at various stages of formation of creative competence of future elementary school teachers are presented and their purposeful use is described.

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