ACADEMICIA

ISSN: 2249-7137 Vol. 11, Issue 5, May 2021 Impact Factor: SJIF 2021 = 7.492

ACADEMICIA
An International Multidisciplinary Research Journal
(Double Blind Refereed & Peer Reviewed Journal)

DOI: 10.5958/2249-7137.2021.01545.7

WAYS OF FORMATION OF THE PROFESSIONAL SKILLS OF UNDERGRADUATE MATHEMATICIANS

Abdimumin Abdiraxmanov*

* Senior Teacher,
Candidate of Pedagogical Sciences,
Karshi State University, UZBEKISTAN
Email id: aabdirahmonov@inbox.ru

ABSTRACT

In addition to the educational goals of teaching mathematics, its developmental and pedagogical goals are realized through problem-solving in practical classes. Problems, the formation of knowledge, skills and competencies of bachelor-mathematicians are used as the main tool in teaching mathematics. It should be noted that the issues aimed at the formation of rules and algorithms in students play an important role in the formation of skills and abilities of applied mathematics. In the process of solving such problems, students develop skills and abilities to calculate, to change the exact form of algebraic and transcendental expressions, to solve equations and inequalities and their systems.

KEYWORDS: *Practical Lessons, Educational, Developing, Educative, Knowledge, Skill, Qualification, Rule, Algorithm, Algebraic, Transcendental, Exact Substitution, Equation, Inequality, Mathematical Activity, Learning, Methodical Skill.*

INTRODUCTION

In addition to the educational goals of teaching mathematics, its developmental and pedagogical goals are realized through problem-solving in practical classes. Accordingly, the issues are used as the main tool in the teaching of mathematics to form the knowledge, skills and competencies of the bachelor-mathematicians. Problem-solving teaching process directly affects students' knowledge as a factor of education; may be focused on the formation of skills and abilities or the exercise of control by the teacher or student on the level of formation of knowledge, skills and abilities. The first of these tasks falls into the category of instructional issues, the second into the category of control issues.

THE MAIN FINDINGS AND RESULTS

Teaching issues are mainly related to the formation of elements of theoretical knowledge and related skills, and when we say theoretical knowledge, we emphasize the concepts and their definitions, theorems and proofs, rules and algorithms that are formed in the process of reading mathematics. Supervising issues are mainly recommended in independent and supervisory work, and these issues involve the application of acquired theoretical knowledge according to the content. The topics proposed in independent and supervised work are usually designed to apply students'knowledge in situations that are familiar to them, and mainly cover a small portion of the study topics.

It should be noted that the issues aimed at the formation of rules and algorithms in students play an important role in the formation of skills and abilities of applied mathematics. In the process of solving such problems, students develop skills and abilities to calculate, to change the exact form of algebraic and transcendental expressions, to solve equations and inequalities and their systems. It is known that in order to form skills and abilities, it is necessary to perform exercises that repeat exactly the rule or algorithm being studied. This creates the need for a system of issues that provides a full mastery of the subject under study. So, we believe that creating a system of problems to master this or that rule or algorithm and learning on this basis is the main way to form skills and abilities in students.

We know that the features of the system of problems aimed at mastering the rules and algorithms are as follows:

- to give questions substantiating the need to study the rule (algorithm);

- the presentation of issues that activate the knowledge required to substantiate the rule and represent the skills required to implement the rule;

-assignment of problems for the performance of certain mathematical operations that are part of the rules;

- the presentation of issues intended to apply the rule in different contexts.

Relevant activities are directly related to the methods of solving certain types of problems, including:

1. Mathematical activities are manifested in the activities of the interval method, etc., which are used to solve inequalities in the application of the coordinate method in the direct or indirect proof of mathematical sentences. Mathematical activities can be defined in the process of carrying out these activities, as well as depending on the content of the issues raised.

2. Learning activities - modeling the basic relationships of mathematical problems, identifying methods for studying certain types of mathematical problems, etc.

If undergraduate mathematicians begin to engage in independent learning, that is, if they are able to select meaningful tools to set educational problems and select teaching aids to solve educational problems, self-assessment, and student assessment activities, then they educational research activities will be formed.

Thus, in the process of learning mathematics, the formation of teaching and learning skills of bachelor mathematicians is carried out in the process of mastering long-lasting mathematical knowledge based on the synthesis of mathematical and educational activities.

Hence, the method of solving certain types of mathematical problems is the interrelationship of learning and mathematical activities. As a result, undergraduate mathematicians gain methodological skills. However, methodological skills can also include general learning activities such as analysis and synthesis, generalization and identification, comparison and classification.

Accordingly, methodological skills can be divided into the following three stages:

1. The first stage in the formation of a methodological skill leads to an understanding of the objectives of a particular methodological or learning activity, an understanding of the content of the action, and often a search for methods that can be performed as defined in a sample instruction or algorithm.

2. In some cases, it is necessary to transfer some of the formed methodological skills to a whole complex, i.e. to mathematical objects and enlarged blocks of subjects (mathematical methods, topics, types of mathematical problems, etc.). This is often done on the basis of an understanding of the purpose and through the use of general recommendations as well as general heuristics.

3. The above-mentioned methodological skill is realized not only in the understanding of the purpose, but also in the complete definition of methods, means and justifications of activity. A characteristic feature of this degree is that the various tools and methodological skills used are implemented in accordance with specific pedagogical situations. In order to develop these skills, it is necessary to provide both theoretical and practical training for undergraduate mathematicians.

As noted above, we have prioritized problem-solving and examples in hands-on activities as a key tool for shaping the knowledge, skills, and abilities of undergraduate mathematicians, because by solving problems and examples, we not only achieve the educational goals of teaching mathematics, but also the developmental and pedagogical goals. Only in such a methodical way can we form the specialties, skills and abilities of future mathematics teachers, i.e. bachelors of mathematics, and perhaps also develop professional skills and abilities as a result of applying the proposed method.

The structure of the current educational process in higher education has great potential for improving the professional training of future bachelors. These options include:

- Involve students in independent work on educational and methodical literature, writing abstracts, lectures on various topics;

- Conducting regular scientific-practical seminars, conferences of students and ensuring their lectures;

- Achieving effective pedagogical practices of students in schools, lyceums, colleges;

- Involve students in conducting mass mathematical activities (mathematical evenings, poetry readings of sharp minds, clubs, etc.) with students in schools, lyceums, colleges;

- Involve students in the successful defense of course and graduation theses and ensure that the content of these works is practiced in schools, lyceums, colleges.

Another opportunity to improve the preparation of undergraduate mathematicians for life in schools, lyceums and colleges is a special seminar, which is provided in the curriculum. In these workshops, we taught students how to solve text algebraic problems. So, the purpose of the special seminar is to improve the preparation of future bachelor mathematicians to teach school, high school and college students to solve text problems. Because in the existing courses in higher education institutions "Methods of teaching mathematics", "Workshop on solving problems in mathematics" very little attention is paid to this topic.

ISSUE 4

The existing combine harvesters on the collective farm can work together and harvest in one day. According to the plan, one combine worked in the first hour, two in the second hour, three in the third hour, and so on. Only a few hours before the end of the harvest did all the combine harvesters work together. If all but five of the combine harvesters had been operating from the beginning of the harvest, the operating time under the plan would have been reduced to 6 hours. How many combine harvesters were there on the collective farm?

SOLUTION

Let there be *n* combines on the collective farm, each of which can harvest 1/*x* part of the crop in one hour. In that case, all combine harvesters can work together for one day and harvest the whole crop. Therefore, we create equation $\frac{24n}{x} = 1$ (1)

In practice, in the first hour, one combine harvester harvested 1/*x* part of the crop, in the second hour, two combine harvesters harvested 2/*x* part of the crop, and so on. In *n* hours n harvesters produced *n/x* part of the crop. Then for a few hours (assuming, m hours) all the combines worked and harvested the remaining *nm/x* of the crop in that m hour. Therefore, we construct

$$\frac{1}{x} + \frac{2}{x} + \cdots + \frac{n}{x} + \frac{nm}{x} = 1 \qquad (2)$$

EQUATIONS

The combine harvesters harvested a total of $(n+m)$ hours of work. If $(n-5)$combine harvesters were working, then they would have harvested in $(n+m-6)$hours. Therefore, we construct 11

$$\frac{(n-5)(n+m-6)}{x} = 1 \qquad (3)$$

EQUATIONS

Hence, we have a system of three unknowns of the following three equations.

$$\begin{cases} 24n = x, \\ \frac{1}{x} + \frac{2}{x} + \cdots + \frac{n}{x} + \frac{nm}{x} = 1, \\ (n-5)\,(n+m-6) = x. \end{cases} \qquad (4)$$

(4) The system of equations is called the mathematical model of the given text problem. To solve this system, we use the formula to find the sum of the terms of the arithmetic progression to its second equation and make it

$$\begin{cases} 24n = x, \\ \frac{(n+1)n}{2} + nm = x, \\ (n-5)(n+m-6) = x. \end{cases} \qquad (5)$$

Given that we lose x from this system and it is $n \neq 0$, we create these

$$\begin{cases} m + \frac{n+1}{2} = 24 \\ (n-5)(n+m-6) = 24n \end{cases} \qquad (6)$$

SYSTEMS

(6) As a result of losing m from the system, we come to the quadratic equation with respect to $n$in $n^2 - 18n - 175 = 0$. Solving this equation, we find the roots $n_1 = 25$ and $n_2 = -7$. Since the number of harvesters from the collective farm is n, it should be $n \in N$. Accordingly, only $n = 25$ satisfy the condition of the case.

In the process of solving the above problems, it became clear that the process of solving any non-standard problem is carried out through the sequential application of the following two basic operations:

1. Replacing a non-standard problem with a problem that is equivalent to it, but has a standard appearance (if necessary, make changes to the form or change the description of the text while preserving the content of the problem);

2. Divide a non-standard problem into several standard problems.

Depending on the complexity of the issue, one or both of these operations can be performed simultaneously.

In general, the process of solving textual problems has its own characteristics, which we consider to include:

1. Determine whether a given problem belongs to a standard or non-standard type by analyzing it.

2. Search for a solution to the problem and make a plan (plans) based on general rules (formulas, identities) or general cases (definitions, theorems).

ISSN: 2249-7137 Vol. 11, Issue 5, May 2021 Impact Factor: SJIF 2021 = 7.492

3. Implement the solution of the problem by applying the developed plan to the conditions of the given problem. If during the implementation of the plan any stage requires the implementation of an additional plan for its implementation, then the same operations are performed for this step (determine the type, create a solution plan, and implement the solution).

CONCLUSION

Based on this, it can be said that in order to avoid difficulties in the problem-solving process, first of all, bachelor mathematicians must be well-versed in mathematics, that is, have mastered all the general rules and general assertions studied in the mathematics course. Second, they need to know how to open and implement the general rules, formulas, identities, definitions, and sequential use procedures of the theorems included in the solution plan. Second, they need to know how to open and implement the general rules, formulas, identities, definitions, and sequential use procedures of the theorems included in the solution plan.

In both cases, this should be done in the process of studying students in higher education, that is, in the process of lectures, practical classes, laboratory classes and independent study. The degree to which they are mastered determines the degree to which the professional skills and abilities of undergraduate mathematicians are formed.

REFERENCES

1. Alixonov S. (1992) *Methods of teaching mathematics*. -Tashkent: Teacher. – p. 200. (Alikhonov S. Mathematics teaching methodology. -Tashkent: Teacher. -1992. -200 бет.)

2. Achilov M. (1979) *Moral formation of the future teacher*. - Toshkent: Teacher. – p. 328.

3. Ahadova M. (1983) *Famous Central Asian scientists and their mathematical works (VIII-XV centuries).* – Tashkent: Teacher. – p. 216.

4. Bevz G.P. (1974) *On the methodological training of future mathematics teachers*. Mathematicsatschool. – Moscow. Number 3. – pp. 62-63.

5. Vakhovsky E.B., Rybkin A.A. (1971) *Tasks in elementary mathematics*. Edit. 2nd. – Moscow: Science. – p. 360.

6. Korolev F.F. (1979) A systematic approach and the possibilities of its application in pedagogical research. Sovietpedagogy, - Moscow: № 9. – pp. 103-115.

7. KolyaginYu.M., LukankinG.L., LmakrushinB. etal. Methodology; teaching mathematics in high school: Private methods: Textbook for physics and mathematics. – Moscow: Enlightenment. – p. 479.

8. Talyzina N.F. (1975) *Management of the processes of assimilation of knowledge*. – Moscow: Moscow State University named after M.V. Lomonosov. – p. 343.

9. Tolaganov T., Normatov A. (1989) *Practicum on solving problems in mathematics.* – Tashkent: Teacher. – p. 256.

10. Tolaganov T.R. (1990) *Professional orientation of the mathematical training of future* *teachers*. Abstract doctoral. Diss. – Tashkent: - p. 38.

11. Shchukina G.I. (1979) *Activation and learning activity of students in the educational process*. – Moscow: Enlightenment. – p. 160.