# DEVELOP THE MATHEMATICAL SKILLS OF STUDENTS WITH TABLES

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## ABSTRACT

This article examines the use of tables and diagrams in the development of mathematical skills among students of higher educational institutions. The scientific significance of the development of mathematical abilities is also revealed using the methods of tables.

**Keywords:** mathematics, methodology, table, drawing, mathematical ability, psychology, activity, skill, training.

## INTRODUCTION

Despite the fact that in modern educational practice, the identification and support of gifted students is one of the priority areas of state educational policy. In theoretical terms, science lacks a clear and uniform interpretation of the concept of giftedness. How many-sided are the manifestations of giftedness in different people in different fields and spheres, so different are the ways and positions of researchers in their study.

If we look at history, the great scientists of each period have conducted a series of experiments in their field of research and achieved results. The aim was to convey the deeper aspects of science to the next generation in clear and simple language. No matter how much research has been done in mathematics and what results have been achieved, it is also an art for educators to perceive it as a science and pass it on to students. At the same time, the science of the methods of teaching mathematics did not go unnoticed by world scientists. They served to facilitate some of the knowledge that the teacher teaches the student, and to make it more understandable for the student. A striking example of this is the news about various teaching methods in strengthening the knowledge of young people, disclosing their talents, both in school and in higher education. In these processes, the problems of determining the mathematical abilities of students and their development are among the urgent tasks. Here we are talking about a number of works by specialists in this field. They mainly deal with the problems of developing students' mathematical abilities [2, p. 78]. Special mention should be made of the scientific work of Russian scientists V.A.Krutetskiy and E.S.Kanin on the development of mathematical abilities, their structure and methodology.

## RESULTS AND DISCUSSION

In the book by V. A. Krutetskiy "The Psychology of the Mathematical Abilities of Schoolchildren" the components of the mathematical abilities of schoolchildren are scientifically investigated, and the components of the mathematical abilities in their 9 networks are listed. [2, p. 4]

E.A. Kostina, on the other hand, has developed a method for applying the proposed structures of mathematical abilities to university students [3, p. 67]. However, these studies do not provide examples of the development of components of mathematical abilities and methods of teaching them to students. Because by increasing the student's mathematical curiosity, they develop mathematical abilities in which the methodology of teaching mathematics plays a key role.

VD Shadrikov believes that abilities are characteristics of the productivity of functional systems that implement a particular mental process (perception, memory, thinking, etc.) [5, p. 28].

V.M. Bekhterev wrote that along with upbringing, one or another degree of giftedness is necessary for any creativity. The term "giftedness" appeared in psychology at the beginning of the 20th century. thanks to the American G. Whipple, who designated them as students with supernormal abilities [1].

In this article, I mainly advocate for the teacher to convey the topic to the student in the most understandable and simple way, and based on my own experience, I support the use of tables and charts in teaching students.

Article by E.S. Kanin's "The student's mathematical capabilities and development IX" shows that in the development of mathematical abilities, his appearance and structure play an important role. This article mainly contains complex examples and explains the reader's ability to assimilate mathematical information and be attentive. [3, p. 153].

Let's start looking for the best method for solving mathematical problems among the traditional existing methods. With the help of meaningful analysis, we have identified among the many methods found the most commonly known and often used. This method is discussed in Table 1.

We take the topic "Linear Differential Equations" as an example, using clear and understandable diagrams and tables, using the visual and imaginative skills of students so that they have clear skills on the topic throughout the course.

The order of teaching students linear differential equations. Mostly tables are used, so it can also be called a "table method". Before drawing the table, let's note the following concepts.

Let's divide the table into 3 main parts:
Part 1. Called "Explaining": concepts and topics that students need to know before this topic is given. For example, general concepts about linear differential equations and topics related to this topic.
Part 2. "Main part": general concepts on the topic are given. Its name, general view, solution methods and examples are explained. For example, the topic: "To give a general idea of a linear equation"
Part 3. This is called "next". The relationship to the following topics is shown. For example, the general concept is given "Equations reduced to a linear differential equation, Bernoulli's equation". It explains to students why today's topic needs to be studied and shows the relationship between the next topic and today's topic. This section was called "Next" because of its connection with the next topic.

Now let's create a table. This table can also be done directly on the board, on paper, or on a computer.

*Table 1.*

<table>
<tr><th colspan="2">Part 1 "Explanation"</th></tr>
<tr><td colspan="2">Briefly describe the differential equations in which the variables are separated and separated.<br>1. General view:</td></tr>
<tr><td>1.1 Differential equations with separated variables<br>$f(x)dx + g(y)dy = 0$</td><td>1.2. Differential equations with variables $f(x)f(y)dx + g(x)g(y)dy = 0$</td></tr>
<tr><td colspan="2">2. Methods of solution</td></tr>
<tr><td>The integral is obtained directly<br>$\int f(x)dx + \int g(y)dy = 0$</td><td>The variables are reduced to a differential equation. To do this, both sides of the equation are divided by the multiplication f (y) · g (x), and the variables are reduced to the following differential equation.<br>$\frac{f(x)}{g(x)}dx + \frac{g(y)}{f(y)}dy = 0$<br>We now solve this equation by direct integration.<br>$\int \frac{f(x)}{g(x)}dx + \int \frac{g(y)}{f(y)}dy = 0$</td></tr>
<tr><th colspan="2">Part 2. "Main part"</th></tr>
<tr><td colspan="2">Provide a general idea of linear differential equations<br>1. General view<br>y ^ '+ P (x) y = Q (x)<br>2. Definition and explanation of why it is called linear. A differential equation that is linear with respect to an unknown function and its product is called a linear differential equation.<br>3. Solutions.
<table>
<tr><th>Bernoulli method</th><th>Lograngе method</th></tr>
<tr><td>$y = uv$<br>$setting\ is\ decided\ by\ entering$</td><td>$c = c(x)$<br>$We\ take\ a\ constant\ number\ c\ as\ a\ function$</td></tr>
</table>
4. Show examples. $y' + 2xy = 2xe^{-x^2}$<br>Bernoulli method: Introduce the notation y = uv<br>$y' = u'v + uv'$<br>We put the following equation in place.<br>$u'v + u(v' + 2xv) = 2xe^{-x^2}$<br>$v' + 2xv = 0$<br>$u'v = 2xe^{-x^2}$<br>then: $v = ce^{-x^2}$ и $u = \frac{x^2+c_1}{c}$ .<br>$We\ find\ the\ general\ solution\ to\ the\ equation\ by\ taking\ y = uv.$<br>$y = e^{-x^2}(x^2 + c_1)$<br>We now explain two methods to students by solving this example in the Lograngе method and getting the same result.<br>$y' + 2xy = 2xe^{-x^2}$<br>$y' + 2xy = 0$<br>When solving this equation, we consider the constant number c as a function.<br>$y = ce^{-x^2}$</td></tr>
</table>

$$c = c(x)$$
$$y = c(x)e^{-x^2}$$
$y' = c'(x)e^{-x^2} - 2xc(x)e^{-x^2} = e^{-x^2}[c'(x) - 2xc(x)]$
leading to this equation, we find c (x).
$$e^{-x^2}[c'(x) - 2xc(x)] + 2xc(x)e^{-x^2} = 2xe^{-x^2}$$
shorten and simplify. $c'(x) = 2x$
$$c(x) = x^2 + c_1$$
The result of its example is as follows:
$$y = e^{-x^2}(x^2 + c_1)$$

5. Get and compare the results. Show students that the result is the same for both methods.

**Part 3 "Next" part**

Where we will use this theme in the future, relevant aspects are outlined
1. Briefly explain the topic of differential equations leading to a straight line.
2. General view:
$$y' + P(x)y = Q(x)y^n, \qquad n \neq 0,1.$$
3. They talk about the solution method: we divide both sides of the previously given equation by $y^n$
$$\frac{y'}{y^n} + \frac{P(x)}{y^{n-1}} = Q(x)$$
$z = \frac{1}{y^{n-1}}$ the record is entered and reduced to the following linear equation.
$$z' - (n-1)Pz = -(n-1)Q$$
this is a linear equation and we link it to today's topic

Mathematicians try to represent the problems under study as accurately as possible from a geometric point of view. Therefore, explanations using tables and diagrams enable students to quickly understand examples and problems.

This example mainly shows that these topics are related to each other and one can use the other. This, in turn, answers the students' questions; Why are we studying this topic and why is the previous topic important?

In this problem, you can, of course, guess at another solution. The difference in the presented approach is that when following the technology of solving problems, the student does not need to “guess”. It is necessary to work out the application of technology in practice, and the result is guaranteed.

## CONCLUSION

Using a variety of coloring techniques in the learning process teaches students a culture of free expression and debate, expressing their mathematical ability. It also provides a deep knowledge of this topic, expands the student's mental activity and helps to improve the effectiveness of the lessons. The use of such technologies is also useful in increasing students' interest in mathematics.

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