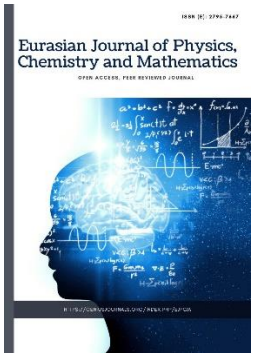

The Problem Of Educational Motivation And The Formation Of A Creative Style Of Teaching Higher Mathematics In Technical Universities

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ABSTRACT

This article provides information on the use of creative methods in teaching students.

Keywords: *education, creative methods, higher mathematics, individual trajectory, creative task.*

Currently, in the process of teaching natural scientific disciplines, the question becomes relevant: What should be the role positions of the teacher and student so that education and training meet the needs of the long-term development of each individual and society as a whole.

In order to teach everyone differently, thereby efficiently and effectively, it is important for the teacher to give each student the opportunity to be educated in his own way and build his own individual trajectory. This path for the student is a continuous discovery of new things. Let's look at this using an example of a creative task.

Task 1. In mathematical analysis, the integral of a function is the extended concept of a sum. The process of finding the integral is called integration. This process is used to find quantities such as area, volume, when solving economic problems, etc.

A. Make a mathematical model of this physical problem: Gas is enclosed in a cylinder with a movable piston. Calculate the work done by the gas when the height of the part of the cylinder containing the gas increases from a

value equal to n_1 to a value equal to n_2 (gas temperature t is constant).

B. What conclusion can you draw about the results of integration?

D. Where can you use your research findings in real life?

C. Think about what other processes from your professional activity can express the physical and mechanical meaning of a certain integral?

E. Present the results of the study in the form of a report.

When completing such tasks, the student must show creative thinking.

Creativity in education reflects the deep-seated quality of the student being taught in his desire to focus on creativity. Mathematical creativity in this process, if we are talking about the presentation of "understandable mathematics," differs in that any creative approach to solving problem-oriented problems must be mathematically reasoned and justified; then a creative educational environment not only motivates students to learn, but helps create conditions for development creative abilities of students. Based on the above, it should be concluded that when preparing students it is important.

1. The presentation of the course of lectures must be carried out from the standpoint of modern applied mathematics, demonstrating the main directions of application of mathematics in the future profession and accompanying them with a sufficient number of examples of practical application.

The examples used should be professional in nature and understandable to students.

In the process of presenting theoretical material, great emphasis must be placed on the applied nature.

2. In practical classes, it is necessary to use sets of specially designed and selected professionally oriented tasks. Problems of this type are the main means of implementing the applied orientation of teaching higher mathematics.

3. Independent work of students of economics and technical specialties must be organized using professionally oriented materials, including theoretical practical, test and control material, methodological recommendations for solving professional and applied problems.

The article presents mathematical problems of professionally oriented content, using the basic properties of integrals.

In economic problems, integration is used to find:

- Product volume
- Cost functions
- Profits
- Consumption, etc.

Let's consider problems on production volume. Let the function $z = f(t)$ describe changes in the productivity of some enterprise over time. Let's find the volume of products Q produced during the time interval $[t_1; t_2]$. Taking into account the definition of the definite integral, we obtain

$$Q = \int_{t_1}^{t_2} f(x)dt$$

That is if $f(t)$ is labor productivity at time t, then $\int_{t_1}^{t_2} f(x)dt$ is the volume of production for the interval $[t_1; t_2]$.

Task 2. Calculate the volume of products produced by the weaver:

- For the entire working day
- For the fourth hour
- For the last hour of work, if the working day is 7 hours, and productivity is given by the formula
  $$f(t) = -3t^2 + 20t.$$
- Conduct an economic analysis of the problem.

Solution

Let's find the total output of the weaver for the entire working day:

$$Q = \int_0^7 (-3t^2 + 20t)dt = \left(-\frac{3t^3}{3} + \frac{20t^2}{2}\right)\Big|_0^7 = (-t^3 + 10t^2)\Big|_0^7 = (-343 + 490) = 147\ (y.e.).$$

For the fourth hour of work

$$Q = \int_3^4 (-3t^2 + 20t)dt = -3\int_3^4 t^2 dt + 20\int_3^4 tdt = \left(-\frac{3t^3}{3} + \frac{20t^2}{2}\right)\Big|_3^4$$
$$= (-t^3 + 10t^2)\Big|_3^4 = (96 - 63) = 33\ (y.e.).$$

We also determine the output for the last hour of work

$$Q = \int_6^7 (-3t^2 + 20t)dt = (-t^3 + 10t^2)\Big|_6^7 = 147 - 144 = 3\ (y.e.).$$

By the end of the shift, productivity drops.

Task 3. The production of cars is given by the formula $z = (42000t + 60)$, $t = 10$ years, where «t» is the number of years.

Solution

The volume of cars produced over 10 years will be equal to

$$Q = \int_0^{10} (42000t + 60)dt.$$

Therefore, the depreciation amount is 210060 since

$$Q = \int_0^{10} 0{,}1(42000t + 60)dt = 0{,}1\left(\int_0^1 42000tdt + \int_0^{10} 60dt\right) = 0{,}1\left(\frac{42000t^2}{2}\Big|_0^{10} + 60t\Big|_0^{10}\right)$$
$$= 0{,}1\left[21000t^2\Big|_0^{10} + 60t\Big|_0^{10}\right] = 0{,}1[2100000 + 600] = 210060\ p.$$

As we see in answer to the question: why is higher mathematics needed?

Easy to answer:

Without application, she would have lost subsidies from applied sciences and would not have become the queen of sciences.

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