Methodological Aspects of the Content of Professional Training of Students

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Abstract:

This article discusses various methods of professional orientation in teaching specific subjects, professional orientation printing in higher education, the functions of professional orientation printing, methodological aspects of professional orientation (the use of various methods,methods and forms and software of education), as well as the principles that help to implement professional orientation: science, the direction of the organization, fundamentalism.

Keywords: professional orientation, printing, methodology, constructive, formative, developing technology, methodological aspect, method, method and form and software.

Currently, on a global scale, attention is increasingly focused on the development of science. Since all sorts of innovations and discoveries arise on the basis of science and technology. In this regard, there is a need to improve the methodological foundations of teaching in order to further increase students' interest in mathematics and develop the application of their professional mathematical practice.

Radical changes in the political, socio-economic spheres are taking place in our republic. These changes also affect the natural process of vocational education, which is carried out in accordance with the needs of society for highly qualified, educated, capable personnel. Currently, the development of mathematical abilities of the new younger generation is one of the most pressing issues. Because it will be easier for him to master other sciences if his mathematical thinking and worldview are broad.

To this end, our state pays wide attention to the development of mathematics. As a confirmation of this, it should be noted that our President paid special attention to mathematics during his visit to research institutes on the capital's Olimlar Street on January 31 this year. At the meeting, the task was set to stimulate interest in mathematics among young people, to select talented children, the need to properly organize work on their coverage in specialized schools, and then in higher educational institutions, to create popular textbooks and textbooks on this subject written in simple and understandable language for students, based on the formation of mathematical consciousness, if necessary, starting from kindergarten, to form interest in the profession.

Mathematics is the basis of all exact sciences. A child who is well versed in this science will grow up smart, broad-minded, will work successfully in any field - our President said.

The researchers examined various ways of implementing professional orientation in teaching exact sciences, such as: the use of non-traditional forms of education such as methods of mathematical modeling, improvement of modern materials, solving practical issues, laboratory work and research activities. The choice of methods and directions for the implementation of professional orientation follows from the essence of specific specialties.

The research work of N.A.Dergunova is devoted to the mathematical training of students of

sociology. Fundamental, special and professional training of students of sociology determined the direction of the mathematics course and, in general, developed a methodology of a differentiated approach to eliminate difficulties encountered by students of sociological content, humanitarian orientation, any differentiated tasks for any professional training. The methodology of career guidance training in geometry, coordinates, vectors, initial mathematical analysis and integers is considered [2].

Also, the theoretical materials describe methods for solving issues of professional orientation related to the educational and research activities of students and the implementation of the task system [1].

In our opinion, the disadvantage of this work is that the author in the theoretical part does not stop at a specific specialty of a technical university. At the same time, as a result of our analyses of practical issues in higher education, research works devoted to the readiness of higher mathematics from the probability theory section to the specialty, based on software, were not carried out. Some dissertations cover all sections of mathematics and physics, but there is not enough data on specific sections, for example, in the section on the practical application of probability theory. Because this section is used not only in mathematics, but is also the main tool in solving vital issues.

In our opinion, from the point of view of substantiating the teaching methodology, it would be correct to consider professional orientation as a didactic principle.

For the first time, the principle of professional orientation in higher education was introduced by R.A.Nizamov, but M.I.Makhmutov gave it a full definition. He saw the realization of this principle in clarifying the content of education and in using special methods, techniques and forms of education. Many researchers believe that professional orientation is a didactic principle of education, because it meets the requirements for didactic principles proposed by I.Ya.Lerner [7]:

a) instrumentality, suitability of pedagogical conditions for planning the description and direction of education;

b) universality, belonging to education or its element, without it there can be no integrity in education;

c) independence, impossibility of replacement and coverage by other principles;

d) necessity, lack of consideration in other principles and the impossibility of the existence of the educational process without it.

This principle is considered one of the basic principles of the system component and didactics of higher education[4]. The main functions of professional orientation are:

consistency, integrativity, differentiation, humanism, motivation, sociality, economic, diagnosis and education[3].

The principle of professional orientation should perform methodological, constructive, formative and developing functions.

The purpose of the principle of professional orientation in teaching mathematics is the formation of a mathematical aspect in the preparation of a graduate of a technical specialty for professional activity in the workplace. This concept may include the development of the thinking process, the formation of methods of mental activity related to the profession, the provision of mathematical apparatus necessary for the study of competitive sciences, as well as methodological preparation for independent continuous study of vocational training and exact sciences [4].

When presenting the section of probability theory, you can specify the factual, theoretical and practical levels of materials orienting to the profession. At the factual level, the material is refined by

illustrative examples and tasks obtained from special or general technical disciplines. At the theoretical level, the possibilities of applying the acquired knowledge in the future specialty are considered in detail. The purpose of the practical level is the formation of practical knowledge, skills and qualifications that can be applied in practice (R.U.Akhmerova).

Based on the above-mentioned judgments, we will clarify the definition of professional orientation by teaching exact sciences to technique and technology of service. The professional orientation of students of technical universities in the field of "Technique and technology of service" by teaching exact sciences is the most important didactic principle, which consists in analyzing the application of knowledge gained in the field of probability theory to technique and technology of service to form and develop the level of preparation for the practical application of sections of probability theory in professional activity, future technique and technology of service, which concentrated the introduction of pedagogical methods and techniques in an orderly form, which is aimed at clarifying the content and programs of education.

Based on the results of the above analysis, as well as the opinions and comments of the authors, knowing that the implementation of career guidance is a meaningful, methodological and spiritual-motivational aspect, we filled these aspects with our own views.

Semantic aspect means the following:

drawing attention to the practical importance of the necessary knowledge corresponding to the specialties of engineering and service technology;

the allocation of educational material expressing the mathematical apparatus of the specialties in the content of the educational material;

professional materials included in the presentation of factual, theoretical and practical levels.

The methodological aspect implies the use of various methods, techniques and forms, as well as software aimed at strengthening career guidance.

For example, the use of various mathematical modeling software in solving practical problems, the organization of independent work with the help of textbooks created on the basis of electronic resources, the use of standard and non-standard tests, an active form of lectures, etc.

The spiritually motivational aspect refers to the development of interest in the profession in the process of teaching subjects that a student should master in the future, as a result of increased motivation in the professional orientation of the individual.

In research papers, based on the activity approach, all spheres of activity are shown, and not that motivation is the engine of activity [5,6,7].

In our opinion, the principle of professional orientation is the basis and system-forming training in maintenance techniques and technologies. Other principles of teaching at a technical university are united around this principle and form an integrity that ensures the formation of the main goal of teaching subjects - the formation of training in mathematical sciences in the professional activities of future technologists. As for the observance of a number of didactic principles, we believe that teaching higher mathematics is one of the conditions for the implementation of career guidance.

The didactic principles that help to carry out professional orientation in the specialty Technique and technology of service, higher technical educational institution, are as follows:

scientific content of education;

methodological orientation of education;

strengthening the fundamentals of teaching exact sciences.

Taking into account the psychological characteristics of students, the coordination of the probability theory section with the learning process implies the following:

the consistency of the structure of the educational and scientific content of probability theory and the spiritual perception of the material;

the principle of "from simple to complex";

the relationship of certainty with abstractness;

promotion of the deductive-inductive method in the presentation of educational material;

activity in education (characterizes the level of student participation in increasing academic activity and practical activity);

independence characterizes the participation of students in the educational process;

implementation of intersubject interrelation.

Below we will list the issues of practical importance in professional orientation in the specialties Technique and technology of service of higher technical educational institutions.

Task 1. The fabric pattern is made in the form of squares and small circles inscribed in them. Find the probability of a randomly inserted needle hitting a small circle.

Decision. The surface of the circle: $S_d = \pi \cdot r^2$. Square surface: $S_{rv} = (2 \cdot r)^2 = 4 \cdot r^2$. The probability

of hitting the circle is: $P = \dfrac{\pi \cdot r^2}{4 \cdot r^2} = \dfrac{\pi}{4}$.

For example, the following question. Select a point on the geographical map at random. Find the probability of hitting a voluntarily selected point on the territory of Uzbekistan?

To answer this question positively, firstly: the result of the experiment should be infinite; secondly: the probability of entering the territory of Uzbekistan should depend on the scale of the map; thirdly: it is necessary to know how many parts of the map occupy the area of Uzbekistan. As a result, the ratio of fields will give a positive answer to the question posed.
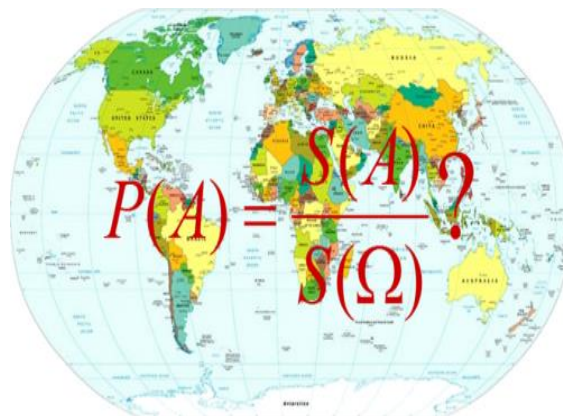
Task 2. The two alarms work independently. If the probability of triggering the first alarm in an accident is 0.9, and the probability of triggering the second alarm in an accident is 0.95, then find out the probability of triggering at least one alarm in an accident.

Decision: *method 1*: A_1 − operation of the first alarm, A_2 - operation of the second alarm. By the

condition A_1 and A_2 are unrelated (free) events. $\underline{A_1}$ - failure of the first alarm, $\underline{A_2}$ - operation of the second alarm. Hence, $P(A_1)=0,9$, $P(A_2)=0,95$ of these $P(\overline{A_1})=1-P(A_1)=1-0,9=0,1$ and $P(\overline{A_2})=1-P(A_2)=1-0,95=0,05$. Now, if A_1 - is the case of triggering at least one alarm $P(A)=P(A_1)P(\overline{A_2})+P(\overline{A_1})P(A_2)+P(A_1)P(A_2)=0,9\cdot0,05+0,1\cdot0,95+0,9\cdot0,95=0,995$.

Method 2: The above phenomena A and $\underline{A}$ are opposite, that is, $P(A)+P(\overline{A})=1$, here $\underline{A}$ is the failure of two signaling devices simultaneously, $\overline{A}=\overline{A_1}\,\overline{A_2}$ and $P(\overline{A})=P(\overline{A_1})\cdot P(\overline{A_2})$ So $P(A)=1-P(\overline{A})=1-P(\overline{A_1})P(\overline{A_2})=1-0,1\cdot0,05=0,995$.

Solving the above issues in teaching higher mathematics in various ways using the principle of professional orientation forms students' skills such as creativity, creative search and creative approach. This ensures that in the future a specialist who has received the desired profession will be able to make an independent decision and apply the knowledge gained in production.

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