INTERACTIVE METHODS OF TRAINING: CONFERENCE OF IRSTU "APPLIED RESEARCHES IN FIELD OF PHYSICS"

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Nowadays all universities of Russia are in process of realizing educational programmes according to federal state educational standards of the third generation (FSES-3) that place requirements towards formation of certain competences among students, and for this purpose interactive forms of training are being introduced.

Physics department of IrSTU undertakes work on introducing new educational technologies into training process. Ways of realization include: lecture courses, laboratory practical works, seminars, conferences, etc. The method of project is basically used within lecture course. We have developed and tested organizational-pedagogic model of professionally-significant projects in physics for junior courses of bachelor degree.

The work on a project is the defining part of it, as in the process interactive forms of education are realized completely. A student obtains experience of constructive activity, thus enabling himself to display his potential abilities in develop creative potential.

Usually, after work on project is finished, we hold a thematic conference, within which reports are presented and the results are discussed. Such conferences are held with support of regional department of Russian academy of natural science.

"It is necessary to improve scientific developments, correct directions of science and technic, develop applied researches" – president V.V. Putin addresses to federal council. Nowadays "applied researches" are treated with a great attention. Federal target programme (FTP).

Scientific and scientific-pedagogic staff of innovative Russia in 2014–2020 demonstrate a state's interest in development of such researches and possibility of creating new scientific directions. Fundamental and applied researches are the two factors of realizing science as a profession.

Within the project of December 2014 department of physics held round table "Applied researches in field of physics". At this conference (round table) students of years 1 and 2 presented their scientific reports.

"The main problem of the conference is to deliver the idea of physics' part within engineering education to young students. Our students carry out not only theoretical researches in field of physics, but also applied studies. They learn to implement this knowledge in creation of new materials, technologies, and tools. Physics should be linked to real life and real production", – comments the first prorector of IrSTU, head of department of physics, Nikolai Konovalov.

Annually up to 200 IrSTU students participate in the conference – energetic students, builders, machinery engineers, miners, etc. Scientific reports are presented by not only Russian students, but also foreigners.

For example, during the present conference Vietnamese students presented their opinion on problems of water environment pollution and suggested to implement nanotechnologies in the circle of water cleaning in Vietnam. Mongolian students spoke of their attitude towards problems of Baikal ecology.

"Physics in my profession. Optical effects in gemstones" was the name of scientific report by student of year 2 from university of subsoil usage Svetlana Berdnikova. "My future specialty is related to technology of artistic procession of stones and metals. Therefore, I decided to study optical effects in gemstones closely, so I am able to implement this knowledge in production of jewelery. It is impossible to produce this type of goods without knowledge in physics. Understanding of physical effects of gemstones allows one to produce a more beautiful objects of jewelery, make them spectacular, underline their advantages", – says S. Berdnikova.

First-year student of institute of metallurgy and chemical technology Handa Shoidokova comes from Zabaikal region. "I began participating in various scientific conferences in school. I am interested in science and discovering something new. I started preparing my report on the 1st of September, exactly when I entered university. The topic I chose is very close to me: "Energy-preserving characteristics of yurt". My nationality if Buryat. Yurt is a native dwelling of shepherds and nomads, and, regardless of the fact that the construction of yurt is three thousand years old, reality of its implementation is still actual". – says K. Shoidokova. It turns out that felt, used in construction of yurt, possesses the lowest heat transition, thus preserving warms for a longer period. Here is why the Buryat, the Evenki, the Chukchi never froze in their yurts during severe colds. "Besides, yurt is a house, constructed according to the golden ratio, its roof forms a pyramidal cone. From the position of mathematics it is an ideal construction. From the position of medicine living in such dwelling is beneficial for health of its inhabitants", – concludes her report K. Shoidokova.

According to the information, received from the first prorector of IrSTU N. Konovalov, the most interesting and perspective works by students will be recommended as topics for graduation diploma projects.

As a result of holding such events, students form a skill of behaving before an audience correctly, present material clearly, speak freely, fit their reports to the time they are provided with.

In the end of work on a project the main problem is solved: new knowledge is acquired, interest

towards mastering physics is formed, as well as the necessary competences [1, 2].

We should underline that it is necessary to use modern interactive forms of training from the junior courses, as during this period scientific foundation is formed and competences, required for self-development and formation of personality.

References

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INDEPENDENT WORK AT HIGHER EDUCATION INSITUTIONS

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The article deals with a form of learning in higher education institutions – independent work, its goals and objectives, substantiates the necessity of improving its forms and control.

The contemporary system of higher education raises many challenges, the most important of which is to improve the quality of training specialists. The graduate should be creative and fluent not only in his or her specialty, but also be fully conversant in allied domains and willing to continuous professional development, initiativity, social communicativeness and mobility.

It is impossible to solve this problem without increasing the role of independent work of students in the learning process, increasing the responsibility of the teacher for the development of skills of independent work in students and growing their creative activity. The student must not only master the skills and experience of using the knowledge gained from the teacher, but also be able to conduct an independent search for the information he or she needs professionally.

Introduction an increased proportion of independent work in educational process actively promotes modernization of educational process.

According to A.A. Mirolyubov, independent work is a variety of individual or collective activity of students during in-class and extracurricular classes and at home without the direct involvement of a teacher, but according to his or her instructions. Students' independent work is based on the principles of independence, didactic and creative orientation, goal-oriented planning, person-centered and activity approach.

The main objectives of students' independent work are:

- systematization and consolidation of book knowledge and practical skills;
- deepen and broaden the knowledge acquired;
- development of cognitive abilities and activity of students;
- development of research skills;
- formation of abilities to self-development, self-improvement, self-realization.

In the educational process of higher educational institutions, the independent work of a student can be implemented in the following forms:

- in-class independent work (carried out during academic studies under the guidance of a teacher and in accordance with his or her assignments);
- extracurricular independent work (carried out by a student in accordance with the teacher's assignments, but without his or her direct involvement);
- research work (participation in scientific research, experimental work).

In-class independent work may be varied: during practical studies and recitations, various types of independent work help make learning more interesting. To control retention of material by, the teacher can use quick tests (multiple-choice items), which are carried out within 5-10 minutes.

"Simulation exercises" is being used now as one of the various forms of students' independent for practical training. The theme of the exercises is usually related to specific practical themes and is of applied nature. It can include tasks of situational modeling on topical issues.

The purpose of a simulation exercise is creating opportunities to develop different versions of the situation and make decisions under simulated conditions.

Carrying out a laboratory-based practical, as one of the learning activities, contains a lot of opportunities for application of active learning approaches and organization of students' independent work.

Extracurricular work may include: reading of recommended sources, their written abstracting, problem solving, written answers to questions proposed, doing of computer practicum, tests, preparation for speaking at seminars, student conferences, writing tests, course papers, and theses.

The Internet resources allow creating a system of independent work, which stimulates cognitive activity of students, facilitates their successful assimilation of the program of academic disciplines (T.S. Volchetskaya). In this case, it is possible to use the following information technologies:

- search for information on the Internet (using a database, using information retrieval and reference systems, automated library systems, electronic journals);