INTEGRATIVE MODEL OF IMPROVING THE CONTENT OF CLASSES IN OPTICS

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ABSTRACT

The article describes an integrative model for improving the content of lectures in practical and laboratory classes in the Optics section of a general physics course and provides a quasimetric analysis of methods for developing and monitoring students' knowledge, skills and qualifications based on this model.

Keywords: A subject, motivation, educational, experiment, qualimetry, non-traditional training, integrative model, non-standard tests, debriefing, debate, quality tasks.

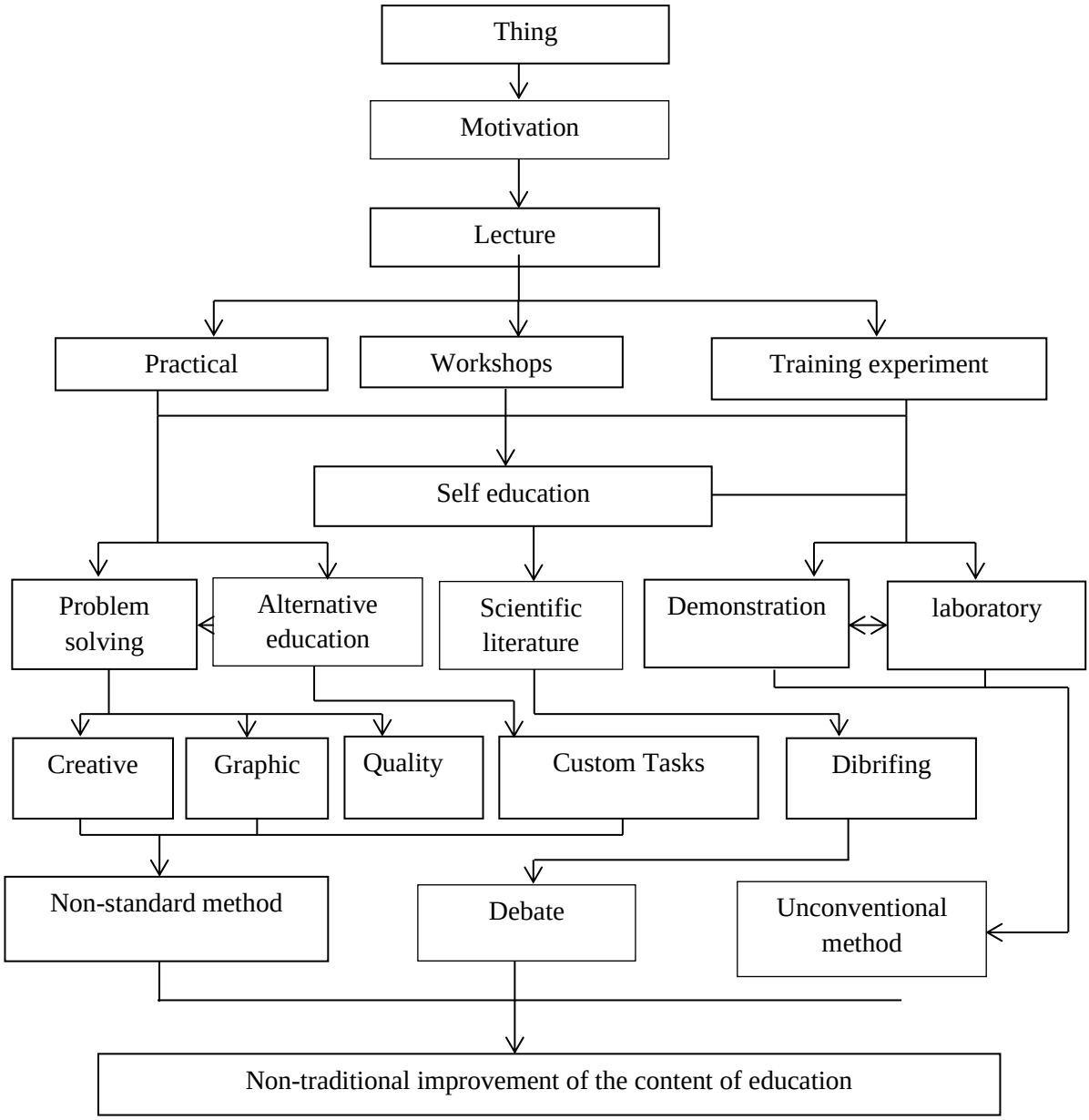
INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

As you know, our country pays special attention to the modernization of the education system, the transition in higher education system that meets the requirements of world standards. To this end, all higher education institutions are equipped with laboratory devices from Germany, Russia and other developed countries. Despite these efforts and successes in the application of modern information technologies, there are many unresolved problems in the implementation of non-traditional teaching methods using the latest technologies. For example, until now, the methodology of teaching in higher education was considered as a secondary task and as a result, methodological pedagogical research in higher education was carried out less in comparison with the General educational system. In fact, the improvement of the educational process on the basis of innovative technologies by non-traditional methods plays an important role in the formation of an interactive educational environment.

Non-traditional learning, being the subjective side of the student's thinking, is determined by initiatives, advantages and their achievements. Conducting classes based only on the interest of the student sometimes may not give the expected results, because these interests often have a chaotic nature in the form of disputes, discussions and independent assessments.

When teaching the optics section of General physics with the improvement of classes by non-traditional methods, the teacher should pay special attention to the definition of the essence of the lesson, generalization, popularization and innovation. As is known, in pedagogical higher educational institutions, classes in optics according to the accounting plan and the standard program are held in the form of lectures, practical, laboratory classes [1] with the inclusion of independent education.

This paper presents the results of pedagogical research on the development of an interactive model of educational activities of the subject, including all types of classes. The scheme of the proposed model is shown in figure 1.



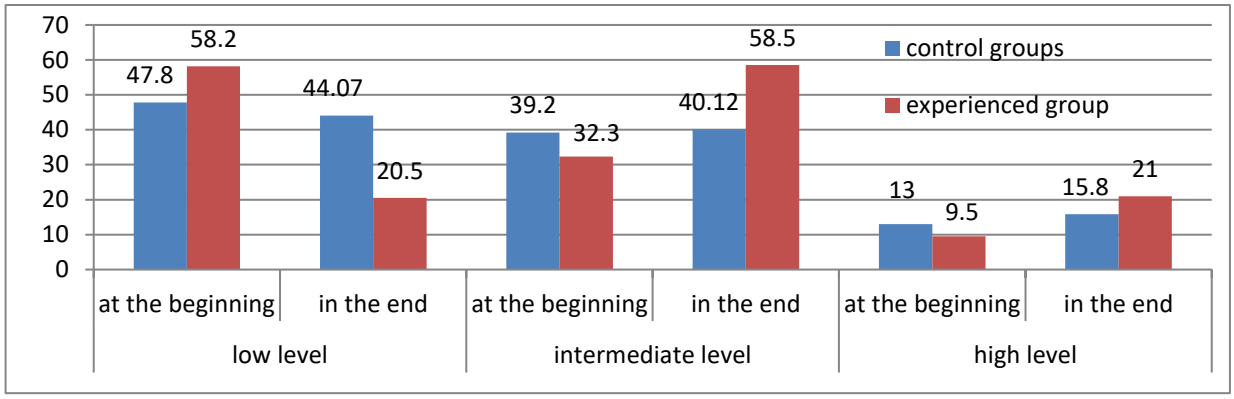
Rice.1. Interactive model of non-traditional improvement of education content

In this model, training sessions on the subject are considered integratively, i.e. as a process of complex training, including lectures, seminars, practical, laboratory classes in combination with independent study of non-traditional and non-standard tasks.

Based on this model, it can be seen that the organization of training sessions and qualimetric control [2] of the results of educational technologies in the learning process depends on the relationship" subject-subject " between the main participants, i.e. between the teacher and the student. With the help of the integrative model, it is possible to develop methods of non-traditional teaching by assessment, control of students ' knowledge, skills and qualifications. At the same time, it is necessary to have a clear presentation by the teacher of the basic requirements for the knowledge and skills of students.

To assess the effectiveness of classes conducted according to the integrative model, trial experiments were conducted in control and experimental groups and the results of the experiment were analyzed.

The results of the experiment to determine the formation of knowledge of students of the compared groups are shown in the diagram in Fig.2.



Rice.2. Qualitative diagram of the level of knowledge of students of experimental and control groups on optics

As can be seen from the diagram: 1) At the beginning of the experiment in the control groups, 13% of students received high marks, and at the end 15.81%. In the experimental groups, the performance indicators increased from 9.5% at the beginning to 21% at the end of the experiment.

2) The Number of students with average grades in the control groups at the initial stage was 39.2%, and at the end of 40.12%. In the experimental groups, there is an increase in the results of academic performance from 32.3% at the beginning of the experience to 58.5% at the end of the experience

3) The Number of students with poor performance in the control groups decreased from 47.8% to 44.07%, and in the experimental groups, these indicators decreased from 58.2% to 20. 5%.

The analysis of the results of trial methodical experiments show that the knowledge and skills of students significantly increase when learning with the use of an integrative model. It should also be noted that the organization of classes in optics on the integrative model on the basis of non-standard tasks, debriefing and debate leads to increased activity of students and thereby improve the quality and effectiveness of training. The proposed model can also be successfully used for teaching other branches of physics.

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