

INTERNATIONAL ASSESSMENT SYSTEMS AND THE PURPOSE OF THE PISA SYSTEM IN PHYSICS

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Abstract:

This article discusses the importance, place and role of PISA in the teaching of physical sciences within the framework of international assessment programs.

Keywords: PISA, assessment, physics, teaching, method, result.

Introduction

The development of educational motivation of schoolchildren is one of the most important tasks throughout the history of pedagogy. After all, it is the development of internal motivation that is the basis of any effective activity, including educational activities [3]. The search for effective ways to improve the educational process, allowing to interest students, find an approach to everyone, take into account their individual educational needs and, therefore, increase activity in the educational process, is undoubtedly relevant in the conditions of modern education.

MATERIALS AND METHODS

For the main definition of individualization, we took the concept formulated by A.A. Terov [2]: “Individualization of the educational process is a way of providing each student with the right and opportunity to form their own educational goals and objectives, their own educational trajectory, giving meaning to the educational action due to the possibility of choosing the type of action, introducing personal meanings, ordering to their learning, vision of their educational and educational prospects.”

Analysis of the goals and principles of individualization allows for a conscious choice of technology for its implementation. In our opinion, gamification could be such a technology.

RESULTS AND DISCUSSION

Game mechanics that are used in gamification mainly affect the way of interaction with the material, with the teacher and with classmates. At the same time, in the theory of gamification



there are practically no techniques that would influence the form of presentation and selection of material to individualize the very content of the subject, taking into account the interests of each student. As an effective mechanics, we suggest considering PISA tasks.

The content of such tasks makes it possible to take into account the areas of interest of differently motivated students. In order to apply the new mechanics, it is first necessary to conduct a survey of students to identify their interests and educational needs, as well as the presence of certain skills. As a result of surveys, conversations and observations, the teacher forms a base of student preferences.

When selecting and constructing PISA-type tasks (tasks developed by Russian methodologists and teachers according to the structure proposed by PISA), the teacher selects a context that is interesting for schoolchildren, which can be different in the subject area, the level of scale of the situation, and is also aimed at developing different types of knowledge and skills, due to which differentiation will be carried out in the lesson.

To introduce gamification using new game mechanics, we have developed a model of the educational process (link in QR code), which is characterized by the following conditions:

- taking into account the educational needs and individual characteristics of each student;
- the ability for students to choose the “player’s path” (individual route) – a variety of content of educational material and forms of activity;
- application of effective “game” mechanics (methods and techniques of educational activities).

Compliance with the above conditions will make it possible to individualize the educational process and, thus, develop the educational motivation of each student.

Having understood what interests and motives determine the student’s activities in the lesson, the teacher selects appropriate game mechanics (including PISA tasks) that are filled with subject content.

The implementation of the educational process according to the proposed model is accompanied by monitoring and correction: at each stage it is necessary to check whether all elements serve to achieve the goal, whether the system contains the choice that students make based on their interests, whether all mechanics fit the needs of students.

CONCLUSION

Despite the short time frame of the experiment, positive results were obtained in the development of schoolchildren’s learning motivation (they were identified during the students’ reflection at the end of lessons, through observations of schoolchildren’s activities and the nature of the questions they asked). It can be concluded that gamification, supplemented with PISA tasks, allows you to individualize the physics learning process.

In the future, it is planned to create a universal step-by-step plan for the implementation of new mechanics, that is, instructions for teachers on creating PISA tasks and methods for using them in order to individualize and develop the educational motivation of schoolchildren in the gamified process of teaching physics. We also consider it advisable to involve teachers in collecting such tasks into a single database on a platform convenient for this.



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