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PROBLEMATIC TEACHING OF PHYSICAL PHENOMENA

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ANNOTATION
In this article, the model of problem-based learning in the learning process is designed for students' thinking and consists in creating a problem situation in the minds of children with the formulation of tasks in learning; finding ways to solve the task, expressing hypotheses; applying the chosen method, a hypothetical task to perform; consolidating knowledge by making a conclusion on the completed task, applying the conclusion in practice

Keywords: problem model of learning, passive, active, differentiation, synthesis, comparison, directive, analysis and synthesis, comparison, generalization

Problematic teaching of physical phenomena in the upper classes can be organized as follows. Observation of the phenomenon, identification of the characteristic features of the phenomenon, identification of this phenomenon, its connection with other, previously studied phenomena, and explanation of the nature (essence) of the phenomenon. The introduction of new physical magnitudes and constants characterizing the phenomenon under study. Establishment of quantitative laws relating to the phenomenon under consideration. Application of the phenomenon in practice. At all stages of the study of a physical phenomenon, the method of problematic teaching can be applied to one degree or another. But the possibilities of problematic teaching are especially opened in determining the phenomenon (essence). We see this in the example of the study of the phenomenon of self-induction for problematic teaching of the phenomenon of self-induction, a "base" experiment is needed, which clearly shows its main essence. An example of this is the observation of a certain experiment indicating the phenomenon of self-induction when connecting an electrical circuit. From experience, the main feature (essence) of the phenomenon is clearly visible: When connecting a spool chain, the current strength is slowly increased in the spool section of the chain. At first glance, it seems to readers that the observed phenomenon is contrary to Om's law for a part of the chain, since the voltage in the parts of the chain connected parallel to them is the same, and when the resistance for these parts of the chain is also made the same (which can be corrected with a rheastat), the change. 1-a problematic situation has arisen. The discussion of the situation that has arisen passes in the classroom as follows. Teacher: "first of all, let's ask ourselves such a question: What physical reason prevents the growth of current in the spool part of the chain? Readers: because the active resistance of the source electric driving force and the chain does not change**.** The reason for this can only be the induction electric driving force, which appears for a short period of time when connecting the chain and has the opposite gesture to the electric driving force I of the source. Teacher: "let's remember the general conditions under which induction electric driving force appears on the contour." Readers: the main condition for this is a change in the magnetic flux crossing the contour. Teacher: "how does a changing magnetic flux form in our experience?»**.** This question makes readers think a little more.

Because they know that induction is at the expense of a source outside the chain of the alternating field that forms the electric driving force, it can be either a magnet outside, or a current passing through another chain outside. 2-a problematic situation has arisen. The discussion of the situation that has arisen passes in the classroom as follows. Teacher: "remember, what is the formation of any magnetic field? "Readers will answer:" from electric current." Teacher: "what about the current state?». Readers will answer: "the chain must have been because of the current that forms in the chain itself after it is connected," although not with confidence. Teacher: "Good. How is induction electric driving force formed?». Readers: answer: "the current does not immediately reach its value after the chain is connected, so the magnetic flux crossing the reel first increases, and induction in it makes the electric driving force appear." After a little silence: "According to Lance's rule, induction electric driving force has such a gesture that it prevents the current from increasing. That is why the bulb does not burn immediately." The teacher said: "This is true, but you always say:"a magnetic flux crossing a reel." If we remove the spool, then even when connecting the chain, the induction electric driving force appears?». Readers:"we have seen that in the part of the chain without a reel, where there is a rheostat, an induction electric driving force is not formed." Teacher: with a little silence, the correct answer is said after waiting for the class: the magnetic flux changes as long as it crosses the chain contour even in the absence of a reel. Hence, the induction electric driving force must be formed. Teacher: "Why don't we watch the light bulb in the rheostat part of the chain burn slowly?». Readers: "most likely the induction electric driving force in this case is too small or it will affect the spool part of the chain in the very short term." Teacher: "explain why this is so." With the partial help of the teacher, students achieve the accumulation of the correct answer to this question as well. As a result of classes organized on the basis of such technology, students will learn that before finding a solution to some problem, its causes must be identified, and then they must choose the methods and methods necessary for their study and elimination, as well as clearly define their actions.

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