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The Influence of Virtual Reality Images on a Person's Thinking and Training

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Since the first usage of the term «virtual reality» by Jaron Lanier in 1989 this concept has had a lot of meanings. In our research the essence of virtual reality refers to three basic characteristics: 1) creation of three-dimensional object images by programming; 2) environmental interactivity; 3) network data processing which is carried out in the real time mode.

In the course of carried-out experiments it was important to define the influence of prompts to a problem (created in the real virtual environment) on implementation of a person's thinking. A visual sensor prompt was suggested to the subjects in the course of thinking where via the helmet of virtual reality the problem components were projected. The Helmet BP Z 800 3D Visor was used in the task. It was established that the three-dimensional image of problem components (or «super-images») influences directly the character of thinking process carried out by a person. After giving a hint the subjects extended considerably the zone of solution search, they experienced new non-standard ideas about possible connections in problem conditions and requirements, the amount of collaterals in the thinking process grew dramatically (75 % of subjects). On the average the amount of collaterals in the thinking process increased 1,5 - 2 times, however, there was a micro-group where this number was 3-4 times higher. The more actions (turns, etc.) are made by the subjects, the more semantic links in thinking are activated by that. Virtual «super-images» activate not only thinking process, but also influence the finding of the correct solution of lateral problems.

Recently there have been created some teaching programs in the real virtual environment in biology for high schools pupils. All objects on the topic «Fiber Synthesis» and so on are created in 3D. The multiplatform tool for the development of three-dimensional applications «Unity» was used for animation. Pupils could zoom the objects during occuring action, stop the scene, received sound comments on those biological processes which were occuring on the screen, etc. They were completely absorbed in processes which were inside the cell during fiber synthesis and could influence them. The view of such software takes 8-15 minutes. This teaching program has dramatically affected the cognitive motivation and interest increase among pupils. The basic results are the following: teaching programs in VR improve answers in tests on corresponding topics among pupils with poor results on 40-50 %, among bright and talented pupils the result is 2 and more times higher.

On the whole the carried out experiments testify that teaching programs in the real virtual environment are effective means of thinking formation and of person's teaching, promote the cognitive motivation formation and person's optimal psychic conditions.