



The Ways of Overcoming Cognitive Limits and New Opportunity for Future Education

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Uncontrolled information growth characterizes modern civilization. As a result, a necessary information for effective action can be neither obtained, understood nor used. This limit can also become a serious obstacle for the development of civilization, including limitations such as mineral resources, pure water, and fresh air. Therefore, we can argue that humanity has been approaching its own cognitive limits through technological and social development, widespread use of information and telecommunications systems and computers. As such, modern culture understands cognitive limits as limiting conditions. The aim of this paper is to analyze new approaches in education connected with the overcoming cognitive limits. The specific aims are to investigate these approaches using interdisciplinary context and self-organization for overcoming cognitive limits. At first, we want to discuss whether it is possible to overcome the cognitive limit using the educational system, and how it is to be done.

We can highlight that, today our education learns about the past, so instead we must teach with the focus on the future. We will provide examples showing alternative paths to resolve the problem. Now we have some strategies for overcoming cognitive limits.

The first one has to do with teaching a number of medical techniques specifically. One example we provide is about an experienced physician who achieved considerable success in treating disease. The problem is that for a number of illnesses, according to the opinion of leaders and standard text books in the area, one should take into account 300 to 1000 signs and parameters of the test results. At the same time a person can act with certainty when 5-7 of those key parameters are present (parameters of the order in terms of synergetic).

Utilization of this approach has made it possible to bring down mortality rates from a number of dangerous diseases by more than three times. We named that strategy "firestarter".

The methods of diagnostic games and computer technologies are very helpful for this purpose. However, in a number of cases there is no such specialist, and the knowledge for an individual or a team has to be developed in the process of learning. In this case simulations or team-based computer games are helpful. Here a simulation makes it possible to demonstrate to the team what happens as a consequence of the decisions it makes. This experience was expanded to training for decision-making.

Another area where this approach can be used is the training of government officials. It is much easier to make mistakes and correct them while ruling virtual cities and countries than make errors in the actual running of the country. We named this strategy "coming down to earth".

And lastly, we will briefly discuss new approaches in education in connection with their interdisciplinary context and self-organization. On one hand a lot of problems and risks of contemporary civilization would benefit from the interdisciplinary approach, and demand corresponding specialists for solving them. Basing on mathematical modeling of the decision-making process in various fields it becomes clear which parameters play the most important role. Selecting order parameters allows us to design new technologies in education. As a result, our experience has shown that many tasks, problems and

difficulties have hidden general systemic issues associated with the need to radically reconsider the content and style of education with the extensive use of interdisciplinary approaches.