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The Model for balancing Learning Workload

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Abstract

It is advised and accepted that teachers carefully plan their lessons thus it is also crucial that there should be guidelines and recommendations on how students should plan their time to study and how much time is necessary to perform certain learning activities. This time management should be taken into account when planning students' workload and for balancing it.
During the research mental representations and approaches were reviewed and their role in the reasoning, as well as within the context of discerning the meaning and similarity. Examples are given for types of statistics and summaries that can help in evaluating the effectiveness and appropriateness of learning materials. The impact of a student's learning workload on learning results was overviewed and a learning workload model was developed taking into account specific criteria. The developed learning workload balancing model can also be implemented in e-learning to improve student workload management in interactive materials and online training.

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1. Introduction

Nowadays students' workload is changing due to the changes in educational traditions. Traditional teaching methodology that has been known for centuries and where knowledge acquisition is based on information memorization, gradually is changing its approach to the development of skills and acquisition of knowledge by searching for the necessary information and the selection of information that is reliable, valid, and suitable for problem solving. For this reason, the education requirements nowadays have increased from acquiring literacy and

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mathematical skills to acquiring skills for critical thinking, ability to speak confidently and clearly, as well as the skills for dealing with complex scientific and mathematical problems[1]. Thus, the role of critical thinking and the existence of common sense, which is the sole characteristic for humans, has become an important aspect in education. Thus, nowadays we can identify learning tasks as follows:

- identify the gaps in knowledge;
- find the necessary information;
- create new knowledge from the selected, verified information.

The aim of the research was to create a learning workload balancing model taking into account various criteria essential for effective learning in a way that students meet the learning objectives and do not to lose their motivation to learn. In order to reach this aim several tasks were brought forward:

- to overview the representations of mental models and their approaches with respect to their role in the cognitive process;
- to investigate the ways and means for evaluating whether the content of learning materials is effective and optimal for achieving learning outcomes;
- to evaluate the effects of learning workloads to learning outcomes;
- to create recommendations for balancing a learning workload.

2. Thinking and Reasoning in the Learning Context

Human perception of the world is based on the mental models or representations of perceived reality. Mental models are the individual's own established portraits of the outside world in the creation of which the experience and existing knowledge participate forming a subjective understanding of reality or constructing new knowledge. Then people use them to react to the external world, respond, cooperate or form their own ideas.

In the cognitive science and literary sources about psychology it is widely believed that people create representations of external reality and then use these representation internally, i.e, they use "mental models" of external reality that allow communicate with the outside world.[2, 3, 4]

Therefore, it can be concluded that distinguishing the similarities and meaning during the learning process is a mechanism by which the understanding is formed, and it is particularly significant in the context of the 21st century when students have to be able to think critically and orientate themselves in the circumstances of information plenitude.

The leading mental models' researchers – Kenneth Craik and Johnson-Laird – considered and it is widely assumed that mental models are "working models" and, consequently, they are dynamic. For the dynamic model representations or forms of expression are considered to be these: reasoning, causal linking, learning.[4] Analogical thinking plays an important role in the reasoning process in which people remember and find similarities and use these for finding solution for other problems in other situations. Similarity or analogy is sought in various fields, such as nature, art, medicine, science or history, transferring concepts from one context or field to another. Thus, for the development of analogical thinking, which can contribute to problem solving and higher level thinking, it is required to develop the tasks by means of which the students can practice and improve their ability:

- to find similarities,
- to find differences,
- to classify – identify the category and sub category signs of the rules defining the category or subcategory.

The idea that the ability to think and judge is natural, like breathing, and there is no need to improve it, is wrong. Reasoning must be learned and trained in order to be able to successfully integrate into the reality and efficiently participate in the learning process. It is a systematic process, if the reasoning is under discussion, as opposed to, for example, daydreaming[5]. It is important that students understand the common principles and relationships between concepts, and not just see the different and common features of the specific phenomena. As knowledge grows wider