

Chapter 7

A Psycho–Pedagogical Model for Evaluating Effectiveness of Students' Learning on the Basis of Electronic Visual Rows

Svetlana Kostromina

St. Petersburg State University, Russia

Daria Gnedykh

St. Petersburg State University, Russia

Galina Molodtsova

St. Petersburg State University, Russia

ABSTRACT

The purpose of this chapter is to propose a model that would enable teachers to assess comprehensively the effectiveness of learners' information acquisition in e-learning environment. The main value of the proposed model is its focus on combination of pedagogical conditions and psychological factors of learning to increase the level of information acquisition. In order to study students' acquisition of learning information in dependence upon the form of presentation as well as identification of learners' psychological characteristics, that help the acquisition of material presented in three visual forms (text, charts, comics) the experiment was carried out. On the grounds of the obtained results, the authors suggest guidelines for application of the model in practice.

INTRODUCTION

One of the main aims of using information technologies (IT) in learning is improvement of the quality of education and its outcomes through raising the effectiveness of learning information acquisition. The modern system of education places much reliance on the use of electronic tools in the educational process, believing that future learner's achievements are linked to the capacity of utilization of electronic

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information resources. The ways of working with learning material that form metaskills, which involve developing the ability to extract and structure knowledge (not only to memorize and store them) relying on information systems, are laid down into the curriculum.

Nowadays, the human interaction with IT in education consists of two stages: at the first stage a teacher creates electronic tools for classes, and at the second stage students get involved in interaction with these tools (Guri-Rosenblit, 2005; Steen, 2008; Frolov, 2011). Both stages involve active use of electronic visualizations to facilitate the process of perception (Multimodal Learning Through Media, 2008). However, despite the long experience in using tools of information visualization in e-learning, blended learning, distance and online learning, their impact on learning efficiency is still controversial. It was established that students' emotional tension and fatigability when reading e-book texts increased in comparison with reading texts of paper books (Kuchma et al., 2012); the rapidity of students' acquisition of information in distance education decreased in contrast to studying the same learning material in the classroom (Balashova, 2011). Thus, the active implementation of electronic tools in the educational process has not led to substantial increase in the training effectiveness. The reasons for this can be explained by the fact that psychological approaches and pedagogical models for using the information technology in education are frequently applied independently of each other.

Therefore, the success in teaching and learning can be achieved by using a complex psycho-pedagogical model considering the combination of learners' psychological characteristics and pedagogical conditions of interaction with IT in education.

In this chapter the authors propose a model that would enable teachers:

- To approach consciously to the choice of the form of electronic visualization of learning material to improve the efficiency of its acquisition by learners;
- To assess comprehensively the effectiveness of the learners' information acquisition in e-learning environment.

This model is the result of the study of established correspondence between the educational environment and psychological factors influencing on the effectiveness of acquisition of learning information by the learners in their interaction with IT.

The chapter provides theoretical and empirical justification of the model, as well as recommendations for its application in practice.

BACKGROUND

The information acquisition is a central part of the learning process (Rubinstein, 2005). There are different approaches to understanding of the information acquisition. McNamara and O'Reilly (electronic resource) define it as a complex process of absorbing and storing new information in memory, which success depends on future reproduction (use). According to O'leary (electronic resource), the process of knowledge acquisition is the basis not only for use but also for production of new knowledge. Lawrence, Lefkowitz and Lesser (1988) draw attention to the fact that the knowledge acquisition requires understanding of how new information fits the information that is already contained in the knowledge base.

According to Russian authors (Nurminsky & Gladysheva, 1991) the process of acquisition includes the following stages: perception of an object (selecting of an object and determining its essential prop-

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