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ANALYSIS OF THE SCIENCE LEARNING OBJECTS OF THE GREEK DIGITAL LEARNING OBJECT REPOSITORY FROM A LEARNING ACTIVITIES PERSPECTIVE

Efthymia Saltidou[i],
Michael Skoumios
University of the Aegean,
Rhodes, Greece

Abstract:
In recent years, learning objects have been playing a crucial role in the teaching process. However, research focused on the analysis of science learning objects is particularly limited. The present study aims to analyze the science learning objects of the Greek Digital Learning Object Repository that are intended for primary school from a learning activities perspective. A total of 178 learning objects were analyzed. The analysis of learning objects from the perspective of the learning activities (cognitive and metacognitive) they activate in the students was carried out in line with the analysis framework of Overman, Vermunt, Meijer, Bulte and Brekelmans (2013). The analysis of learning objects showed that they are dominated by low level cognitive learning activities, while the learning objects that activate high level cognitive learning activities are limited. Finally, no learning objects activating metacognitive learning activities in the students were detected.

Keywords: question analysis, learning objects, science teaching, learning activities

1. Introduction

This study belongs to the wider field of research that is focused on the analysis of science instructional material. In particular, the present study centres on the analysis of science learning objects.

[i] Correspondence: email efisaltidou92@gmail.com

The science learning process is largely shaped by the instructional material, which directly affects students' learning as the students interact with it. It also indirectly affects students' learning through its effects on the teachers and their teaching choices (Reyes, Reys, Lapan and Holliday, 2003). The activities included in the instructional material could encourage the students to focus on the content they offer and could significantly contribute to the learning process (Kahveci, 2010; Overman et al., 2013). They affect but also guide the students to choose, codify and process information (Davila and Talanquer, 2010). They can also contribute to building new knowledge and developing students' skills (Giordan and Vecchi, 1996). Apart from their content, the cognitive level of the activities is an important factor that can affect the process of linking the new information acquired by the students with the knowledge they already possess (Davila and Talanquer, 2010). As a result, research intending to analyze science instructional material from the perspective of learning activities (cognitive and metacognitive) should be carried out.

Although the importance of the instructional material in science education has been recognized, the research that is focused on its analysis from a learning activities perspective is limited. The studies that have been published are mainly focused on the questions of school textbooks (Davila and Talanquer, 2010; Overman et al., 2013; Pizzini, Shepardson and Abell, 1992). However, due to the great progress in digital technologies in recent years, the use of digital learning objects has gained ground. Considerable amounts of money have been invested, aiming at the development of learning objects and the creation of learning object repositories that can manage collections of learning objects (Friesen, 2004). Nevertheless, there are no research papers analyzing science learning objects from a learning activities perspective, which shows the need to conduct this research. This study is particularly important because it provides information to the teachers and the designers of learning objects about the kinds of questions and the learning activities these questions activate in the students.

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