INTRODUCTION

In this paper we present the firsts results of a research based on the 4C/ID-model (Four Components – Instructional Design Model), suitable for complex learning, developed by van Merriënboer and colleagues in the 90s (van Merriënboer, 1997), that corresponds to an extended version of the article "Applying the 4C-ID Model to the Design of a Digital Educational Resource for Teaching Electric Circuits: Effects on Student Achievement" presented at the IDEE 2014 workshop (Melo & Miranda, 2014). Despite of the existence of other instructional design models, the 4C/ID-model acquire a high formulism level evidencing as a suitable model to teach complex skills, as it is most of the learning that takes place at school and professional training. Moreover, this model is very susceptible to the development of digital educational resources and multimedia learning environments that are increasingly used in education and vocational training. We will consider the design of a digital resource for teaching and learning electric circuits based on this model and the main results achieved with its application to students in the 9th year of schooling, following an experimental research design.

The main objective of this study is to compare the effects of two instruction approaches in reproduction and transfer tasks, perceived cognitive load and instructional efficiency. Science aims to achieve several goals, including replicating results and innovating. The innovative dimension of this article is the application of the 4C-ID model to the basic levels of education, since until now it has been used in university and professional training.