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# Cognitive Approach of Two Technology Based Learning Environments of Modelisation and Simulation Intend to a Scientific Education<sup>1</sup>

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## Abstract

*Computer equipment and technology based environment intended for education and training using new communication and information technologies (ICTs) contribute to the modification of the contexts of teaching and learning. We present a study concerning the learning of physics (mechanics) while using the 'PHYSICS BY IMAGE' AND 'MODELSCREATOR' technology based learning environments.*

## "1. Introduction"

After two decades of work centered primarily on the design of technology based learning environments, we proved entered a phase where it proves necessary to lead detailed studies of pupils cognitive activities when confronted with these environments [1]. The objective is to encircle what pupils learn by using the technology based learning environments.

## "2. The compared software"

'Physics by image' (Sciencesoft, 1998) is a technology based learning environment of simulation currently marketed in various countries. It makes it possible to approach the theoretical part of physics and into practice to put it with an experimental approach (simulations, video). ModelsCreator is a technology based learning environment, currently in a prototype state [1] designed to familiarize pupils with the steps of modelling.

## "3. Conclusion and prospects"

The comparison between the conduits of the pupils and the two types of technology based learning environments underlines the need for a comparison between the aspects of reality, their conceptualisation and the symbolic notations of those [2]. The learning of physics rests in fact on this type of comparison. The use of the technology based learning environments can facilitate these comparisons, provided that it intervenes jointly with the concrete realization of experiments especially for pupils of lower secondary school who do not control yet the tools for formalization. It proves that the representation of entities, properties and relations in a figurative form (case of ModelsCreator) enables the pupils to use the technology based learning environment in a more meaningful way compared to the world of actions, objects and events. This enables them to be detached from the actions and the perceived events for centering on the relations between analytical characteristics of the situations.

## "4. Bibliographie"

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- [2] G. Lemeignan et A. Weil-Barais, *Construire des concepts en physique; l'enseignement de la mécanique*, Paris, Hachette, 1993.

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