



## **Knowledge of the Cognitive Structure of Students through Pathfinder Associative Networks Technique in the Context of PmatE**

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### **Abstract**

CIBERDIDACT Research Group, at the University of Extremadura (Spain) has been working in the knowledge of the student's cognitive structure in the mathematics .

Virtual environments, through which it holds and conveys the teaching, learning and assessment of mathematics education at different levels, are now a topic of interest that needs to be researched.

Within the Project Mathematics and Teaching, the University of Aveiro (Portugal), keeps developing a virtual environment based on the web, called PmatE (<http://www.pmate.ua.pt>). This is a resource formed by a "factory math tests" based on exercises or modular problems and a learning management system that monitors and records the activities and students' outcomes.

This research aimed to verify the educational possibilities of the learning environment PmatE, applied to conceptual teaching and learning of the four arithmetic operations, with students from year 4 of primary education.

PmatE environment was submitted to an evaluation in context, involving the participation of teachers and students in educational situations of resource use. This evaluation studied students and teachers' cognitive structures on the conceptual knowledge of arithmetic, by the technique of "Pathfinder Associative Networks", which supported the analysis and representation of cognitive networks, based on the "Theory of Nuclear Concepts, conceptual framework of this work.

Important conclusions were reached that reinforce the need for teachers to have useful tools to evaluate students' knowledge and effective forms to evaluate the quality of digital educational resources.