TITLE:

LEGO Mindstorms: Didactic utilization in mathematics with a focus on fractals

ABSTRACT:

The objective of this thesis is to determine whether the teaching of fractal geometry supported by computer and robotic LEGO Mindstorms NXT has its place in the education of primary and secondary schools pupils in the Czech Republic. The theoretical part focuses on key topics and personalities closely connected to fractal geometry problematics. It provides a brief historical overview of the fractal geometry development, its potential use in teaching mathematics (with reference to Turkish curriculum documents), and a description of LEGO Mindstorms NXT which can well serve as a manual for teachers and pupils. The practical part contains instructions for building a robotic turtle as well as a proposal of teaching block aimed to support pupils' algorithmic and geometric thinking including key competencies. Quantitative comparison of the results taken from Turkish studies and evaluation of the project by the author and pupils are a part of the experiment as well.

KEYWORDS:

LEGO Mindstorms NXT, fractal, programming, Logo, learning by doing, turtle, Papert, L-system, microworlds