Modelling Children’s Mathematical Gift By Neural Networks and Logistic Regression


**Abstract.** The purpose of the paper was to extract important features of children’s mathematical gift by using neural networks and logistic regression, in order to create a model that will assist teachers in elementary schools to recognize mathematically gifted children in an early stage, therefore enabling further development and realization of that gift. The initial model was created on the basis of a theoretical background and heuristical knowledge on giftedness in mathematics, including five components: (1) mathematical competencies, (2) cognitive components of gift, (3) personal components that contribute gift development, (4) environmental factors, (5) efficiency of active learning and exercising methods, as well as grades and out-of-school activities of pupils in the fourth year of elementary school. The three neural network classification algorithms were tested in order to extract the important variables for detecting mathematically gifted children. The best neural network model was selected on the basis of a 10-fold cross-validation procedure. The model was also investigated by the logistic regression. Important predictors detected by two methods were compared and analyzed. The results show that both methods extract similar set of variables as the most important, including grades in mathematics, mathematical competencies of a child regarding numbers and calculating, but also grades in literature, and environmental factors.