

DEVELOPING KINDERGARTEN CHILDREN'S LEARNING SKILLS

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The theoretical background of the present study is based on meaningful learning and concept mapping. The theory of meaningful learning was developed by *Ausubel* (1968). He calls attention to the role of prior knowledge as well as the recall, construction and organization of information. Based on Ausubel's learning theory, Novak created the technique of concept mapping in the 1990s. Concept maps make possible the visual representation of information.

The main objective of the present research was to foster children's meaningful learning through concept mapping and to analyse the effects concept mapping on the performance of children who showed low levels of achievement in a pre-test. Our research was implemented in the framework of the Project Method as developed by Kilpatrick. The concept-map activities were integrated into project-based sessions. Project-based learning is a constructivist method which supports knowledge acquisition, analysis, reflection and children's active learning.

The present paper examines the effects of our concept-mapping based learning programme on preschool children's development. The data were collected in two phases with an experimental group and a control group in both. The first phase of data collection took place in 2011 ($N_{\text{exp}}=27$, $N_{\text{contr}}=27$) and the second phase ($N_{\text{exp}}=24$, $N_{\text{contr}}=43$) in 2014. The experimental groups participated in the concept mapping based developmental sessions over a period of six months. The effectiveness of the programme was assessed using two tests from the DIFER measurement tool system (Diagnostic System for Assessing Development). The DIFER test battery is a diagnostic tool for 4-8 year-old children in Hungary. The two tests are the Comprehension of Relations and Experiential Reasoning.

In the first phase of the research, the experimental group achieved significantly lower scores than the control group at the pre-programme experiential reasoning test ($M_{\text{exp}}=31$, $M_{\text{contr}}=49$) and this difference disappeared by the end of the programme ($M_{\text{exp}}=58$, $M_{\text{contr}}=57$). As regards the comprehension of relations, the experimental group started with a significant disadvantage once again ($M_{\text{exp}}=53$, $M_{\text{contr}}=62$). At the end of the programme, however, we did not register significant differences between the two groups ($M_{\text{exp}}=67$, $M_{\text{contr}}=68$). We also measured the size of the effect of the concept-map learning programme and found it to be substantial, especially for experiential reasoning ($d=.86$; comprehension of relations: $d=.16$). Most importantly, what we found at the end of the first phase is that the number of under-achieving children in the experimental group was decreasing. In the second phase of the project, the control group started with an advantage on the experiential reasoning test ($M_{\text{exp}}=30$, $M_{\text{contr}}=40$) as well as in the comprehension of relations ($M_{\text{exp}}=51$, $M_{\text{contr}}=58$). The post-programme test will be administered at the beginning of April. We expect to replicate the very positive outcome of the first phase.

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