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THE INFLUENCE OF 4MAT MODEL ON ACADEMIC ACHIEVEMENT AND RETENTION OF LEARNING IN TRANSFORMATION GEOMETRY

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Abstract
This study investigates the influence of 4MAT model in the teaching of "Transformation Geometry" – a subject included in secondary school seventh grade mathematics curriculum – on students' academic achievement and retention of learning. 4MAT model, which is one of the contemporary educational approaches, is based on perceiving and processing knowledge. 4MAT model was designed by considering all of four learning styles in such a way that all learners could find a timeframe suitable for them. It defends developing student-centered learning environments based on the learning styles of students and making students discover knowledge by themselves. It enables students to use both hemispheres of their brains effectively (McCarthy, 1990). The pretest-posttest control group quasi-experimental design was used in the study. The study took 3 weeks. This teaching period was determined by considering the time recommended in the textbook and the time allocated for activities in other studies on 4MAT model. In this period, experimental group students were taught by lesson plans and activities based on 4MAT model. Control group students were taught by the 7^{th} grade textbook of the Ministry of National Education in the same period. The research sample consisted of 61 seventh grade students living in a northern province of Turkey. The Transformation Geometry Knowledge Test developed by the researcher was used as data collection tool. This test was used in this study as a pre-test at the beginning of the teaching process, as a post-test at the end of the teaching process and as a retention test one month after the teaching process. The present study concluded that there was a significant difference in favor of the experimental group between the experimental group students and the control group students in terms of academic achievement and retention of learning in the learning of transformation geometry subject. It was seen that 4MAT model was more effective in the teaching of transformation geometry in comparison to textbook-based teaching.

Keywords: Mathematics education, 4MAT model, brain hemisphere, learning style, transformation geometry.