

## Investigation of Secondary Students' Process of Constructing Multiplication in Experiences According to RBC+C Model\*

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### Abstract

Mathematics is a science of abstraction and various models were needed to abstract these concepts. One of these models is the RBC+C model developed by Hershkowitz, Schwarz and Dreyfus in 2001. Based on this model, in which the cognitive actions of recognition, use, structuring and reinforcement are used, the process of creating the multiplication process in exponential numbers of secondary school students was examined. The sample of the study consists of thirty-two sixth grade students and twenty-nine seventh grade students studying in a public school in the Nilüfer district of Bursa province in the 2022-2023 academic year. Stratified purposive sampling was used because the participants were at different grade levels and to observe the difference in the creation processes. Six questions were determined for the study, and the validity and reliability of the questions were ensured by expert opinion. The study is a qualitative research and document analysis was used in the analysis of the data. As a result of the findings, it was seen that most of the students performed the actions of recognition and use, but they could not perform the action of creating. Since most students tried to find the correct number in the result, they could not form the desired concepts. In addition, it was observed that most of the students had misconceptions in exponential numbers, so they had difficulty in forming the concept. In addition, it was determined that sixth grade students made fewer operational errors than seventh grade students. It is thought that students' desire to reach the right result depends on result-oriented evaluations rather than the process in the education system. In addition, although constructivist approaches are accepted in the education system, the application of plain language still causes negativities for students to discover. In order to prevent this situation, models that give importance to configuration such as the RBC+C model can be preferred. In exams that measure success, process-oriented evaluations can be made instead of results.

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