

Spanning set: an analysis of mental constructions of undergraduate students

María Trigueros, Asuman Oktaç, Darly Kú

In this study we use APOS theory to propose a genetic decomposition for the concept of spanning set in Linear Algebra. We give examples of interviews that were conducted with a group of university students who were taking an analytic geometry course and their analysis in relation to our genetic decomposition. We also comment on the nature of difficulties that students experience in constructing this notion. One of the results that are obtained in this research that is in line with previous results reported in the literature is the difficulty in distinguishing a spanning set from a basis. Another aspect is that students have varying levels of difficulty when working with different types of vector spaces. As was expected, the concept of linear combination plays a very important role in the understanding of the notion of spanning.

Keywords: Spanning set, APOS Theory