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The Eye Tracking Technique and the Study of Some Abstract Mathematical Concepts at the University

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Abstract : This article presents the results of mixed approach research, where the ocular movements of students are examined while they solve questionnaires related to some abstract mathematical concepts. The objective of this research is to determine possible correlations between the parameters of ocular activity and the level of difficulty of the tasks. The difficulty level categories were established based on two types of criteria: a subjective one, through an evaluation, carried out by the subjects, and a behavioral one, related to obtaining the correct solution. Correlations of these criteria with ocular activity parameters, which were considered indicators of mental effort, were identified. The analysis of the data obtained allowed us to observe discrepancies in the categorization of difficulty levels based on subjective and behavioral criteria. There was a negative correlation of the eye movement parameters with the students' opinions on the level of difficulty of the questions, while a strong positive and significant correlation was noted between most of the parameters of ocular activity and the level of difficulty, determined by the percentage of correct answers. The results obtained by the analysis of the data suggest that eye movement parameters can be taken as indicators of the difficulty level of the tasks related to the study of some abstract mathematical concepts at the university.

Keywords : abstract mathematical concepts, cognitive neuroscience, eye-tracking, university education
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