

Problem Solving in Chilean Higher Education: Figurations Prior in Interpretations of Cartesian Graphs

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Abstract : A Cartesian graph, as a mathematical object, becomes a tool for configuration of change. Its best comprehension is done through everyday life problem-solving associated with its representation. Despite this, the current educational framework favors general graphs, without consideration of their argumentation. Students are required to find the mathematical function without associating it to the development of graphical language. This research describes the use made by students of configurations made prior to Cartesian graphs with regards to an everyday life problem related to a time and distance variation phenomenon. The theoretical framework describes the function conditions of study and their modeling. This is a qualitative, descriptive study involving six undergraduate case studies that were carried out during the first term in 2016 at University of Los Lagos. The research problem concerned the graphic modeling of a real person's movement phenomenon, and two levels of analysis were identified. The first level aims to identify local and global graph interpretations; a second level describes the iconicity and referentiality degree of an image. According to the results, students were able to draw no figures before the Cartesian graph, highlighting the need for students to represent the context and the movement of which causes the phenomenon change. From this, they managed Cartesian graphs representing changes in position, therefore, achieved an overall view of the graph. However, the local view only indicates specific events in the problem situation, using graphic and verbal expressions to represent movement. This view does not enable us to identify what happens on the graph when the movement characteristics change based on possible paths in the person's walking speed.

Keywords : cartesian graphs, higher education, movement modeling, problem solving

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