UNIVERSITY STUDENTS' EXTENSION OF LINEAR MODELS TO NON-LINEAR SITUATIONS

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This communication presents a study of university students' extension of linear models to non-linear situations. By linear models we mean the model $y=a.x+b$, particular representations of direct proportionality and the diagram for the rule of three. This phenomenon has been studied at the primary and secondary levels, and has been called "illusion of linearity" or "linear misconception" (Behr, Hare, Post, & Lesh, 1992; De Bock, Von Doorem, Janssens, & Verschaffel, 2002; De Bock, Von Doorem, Verschaffel, & Janssens, 2001; De Bock, Verschaffel & Janssens, 1998). There exists agreement in describing the "linear misconception" as persistent and resistant to change. Studies about this phenomenon among university students are not frequent, even though its presence and persistence have been observed in diverse types of problems and contexts at that level. That situation led us to carry out an exploratory study to document, describe and analyze the presence of such phenomenon among Argentinean 18-20-year old students, which were studying agronomy in the University of Córdoba, and were attending their first calculus course. Using students' written productions, we analyzed the types of problems that were solved by extension of a linear model, the students' strategies, and the difficulties of interpretation that could be associated with the statement of the problems. The students' errors were not understood as failures, but rather as a construction based on their mathematical conceptions that have epistemological value. We also analyzed the particular teaching environment of the calculus course in order to raise some conjectures to explain the phenomenon from the teaching perspective.

References

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