MATHEMATICAL LOGIC IN SECONDARY SCHOOL: A PROPOSAL FOR RAISING REASONING

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This work is a research of Classical Logic inserted in the context of teaching mathematics for students of secondary school. The activities applied were inspired in the use of the program Tarski's World created by the researchers Barwise and Etchemendy (1996), with the intention of proposing tools "[...] that could facilitate the students' ability to visualize the abstract subject in terms of logic, and in this way work more efficiently with them". (Barwise & Etchemendy, 1996, p.2-3). The activities proposed can favor the understanding of the logical operators providing support so that the secondary school student can understand some "rules" used in Mathematics, useful in "demonstration" and "verification" situations, considering the fact that "mathematical knowledge is associated with the problem of validation of the learned content" (Pais, 2001, p.37) and that "the student should be stimulated to do work aimed at their initiation into 'scientific investigation'" (ibid, p.35), including subjectivity allying with an appreciation of logical and argumentative reasoning. Our objective should be to establish to the degree possible, secondary school students who develop mastery and skills in the use of the rules of classical logic. The methodology used in this research was didactic engineering characterized by as an experimental schema based on 'didactic realizations' in the class room, that is, on the conception, realization, observation, and analysis of teaching sequences. The subjects of classical logic and the activities was planned to discuss were distributed in sessions in the following: Recognition, Negation and Conjunction, Disjunction, Implications and Bi-conditional, Quantifiers with sentence analysis, construction of the world and challenge of the worlds. Situations that were developed with the goal of showing a conflict between a "day-to-day" logic and a classical logic also received attention and satisfactory results. The negation of the conjunction, disjunction, and implication, and the inclusive interpretation of the disjunction generated a strong conflict between common sense and classical logic. We conclude that the activities offered situations in which it was possible for secondary school students to develop certain understandings and abilities regarding the use of the rules of classical logic.

References

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