

ZMATH 2015b.00488

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The role of symbols in mathematical communication: the case of the limit notation.

Res. Math. Educ. 16, No. 3, 251-268 (2014).

Summary: Symbols play crucial roles in advanced mathematical thinking by providing flexibility and reducing cognitive load but they often have a dual nature since they can signify both processes and objects of mathematics. The limit notation reflects such duality and presents challenges for students. This study uses a discursive approach to explore how one instructor and his students think about the limit notation. The findings indicate that the instructor flexibly differentiated between the process and product aspects of limit when using the limit notation. Yet, the distinction remained implicit for the students, who mainly realised limit as a process when using the limit notation. The results of the study suggest that it is important for teachers to unpack the meanings inherent in symbols to enhance mathematical communication in the classrooms.

Classification: E45 C55 I25

Keywords: duality of symbols; limit notation; teacher-student discourse; undergraduate mathematics education

doi:10.1080/14794802.2014.919872