

Abstract

Student teachers specializing in mathematics attend lectures, exercises, and seminars in German during their bachelor's degree program. However, scientific texts they work with are in English in many cases. Since in mathematics many terms from the common language are used and defined in a subject-specific way, it then seems appropriate to consult common language dictionaries as translation aids. However, these often cover the mathematical readings of a lexeme only inadequately. Electronic dictionaries on mathematics, which have been didactically evaluated, are not available at the moment (in 2023). From dictionary usage research there are many results on foreign language learning, but hardly any on specialized language learning.

In the present work, therefore, a prototype for an electronic specialized learning dictionary for mathematics, exemplified by graph theory as a subject, is developed and evaluated. The development relies on computational linguistic procedures for term and definition extraction from a corpus on graph theory created in the project. The use of the procedures on the graph-theoretical corpus also shows limitations to the established methods when applied to mathematical texts.

The evaluation of the implemented prototype is task-based using Wikipedia as a comparison resource since Wikipedia is otherwise often used by students as a tool. The tasks cover the following aspects: reception of terminology in the L1, reception of terminology in the L2, production of terminology with conceptual stimulus, production of terminology with graphic stimulus. The survey is conducted for two cohorts ($N = 182$ for Wikipedia and $N = 113$ for the dictionary prototype) in a mixed-methods design. For quantitative analysis, the *t*-test and different correlation measures are used while free comments of the participants are examined through a qualitative content analysis.

The results show in particular which requirements an electronic dictionary on graph theory has to fulfill concerning article structure and access structure in order to be a relevant alternative to Wikipedia for students.