Titel

Learning Limits of Functions, university students' development during a basic course in mathematics.

Sammanfattning

The present thesis includes four articles and an introduction to them and the theories that frame them. The articles describe a study about students' learning limits of functions at a university and the results from it. The main question is: How do students deal with the concept of a limit of a function at the basic university level in Sweden? In an attempt to answer this big and wide question, a set of narrower questions are considered: What are the results of students' creations of mental representations of limits of functions? Do the representations change during the time of the study? What changes if anything? Do high achievers' representations differ from low achievers' representations of limits of functions? How do students solve problems with limits? How do they explain their solutions? What effects can attitudes to mathematics and actions in the classroom have on the learning of limits of functions?

Different methods were used in order to seek answers to the questions. They were questionnaires at different times during the course, field observations and interviews. The study was divided in two parts with a pilot study with 148 students and a main study with 112 students.

The limit concept is an important part of the foundations of mathematical analysis and if the students do not understand clearly what it is about, they can get problems when they are dealing with concepts as continuity and derivatives.

No such study on limits has previously been done in Sweden so it is compared mostly to foreign results. It is important that people who work with mathematics education at university level are aware of the situation the students are in.