

UNDERGRADUATE MATHEMATICS STUDENTS' UNDERSTANDING OF THE CONCEPT OF FUNCTION

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Abstract

Concern has been expressed that many commencing undergraduate mathematics students have mastered skills without conceptual understanding. A pilot study carried out at a leading Australian university indicates that a significant number of students, with high tertiary entrance ranks, have very limited understanding of the concept of function, despite the emphasis it receives in the secondary mathematics curriculum. Whilst most students were familiar with families of functions, many were unable to give an appropriate definition or recognize whether a given graph or rule represents a function; and could not make correct connections between function graphs and tables of values.

Keywords: Algebra, Functions, Secondary School Mathematics, Undergraduate Mathematics

Abstrak

Keprihatinan telah diungkapkan bahwa mulai banyak mahasiswa sarjana matematika telah menguasai keterampilan tanpa pemahaman konseptual. Sebuah penelitian yang dilakukan pada sebuah universitas terkemuka di Australia menunjukkan bahwa sejumlah besar mahasiswa, dengan peringkat masuk yang tergolong tinggi, memiliki pemahaman yang sangat terbatas terhadap konsep fungsi, meskipun penekanannya pada materi yang diterima mereka dalam kurikulum matematika sekolah menengah. Sementara sebagian besar mahasiswa yang akrab dengan keluarga fungsi, banyak yang tidak dapat memberikan definisi yang tepat atau mengenali apakah grafik yang diberikan atau aturan merupakan suatu fungsi; dan tidak bisa membuat hubungan yang benar antara fungsi grafik dan tabel nilai.

Kata Kunci: Aljabar, Fungsi, Matematika Sekolah Menengah, Mahasiswa Matematika

The notion of a *function* has been seen as a unifying concept both within mathematics and also between mathematics and the real world. It is widely agreed that a strong understanding of the concept of function is vital for students studying calculus. In later years of secondary schooling, much of the mathematics curriculum is devoted to the study of calculus. It is the function that is the fundamental object in calculus, and not just any function, but a continuous function, so to really understand calculus, students need a sound understanding of functions. Research (see below) has shown that an understanding of function develops over an extended period of time and that in the past many undergraduate students demonstrated poorly developed notions of function. Much of this research was conducted in the early 1990's; since then two decades have passed but has the situation changed? The research reported in this paper explores the conceptual understanding of functions held by current students from a leading Australian university.