

Analysing Students' Conceptions Underlying the Errors in Algebraic Expressions: A Case Study on Cambodian Ninth Grade Students

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Abstract

Purpose- It is crucial for teachers to understand what students already know and what they are thinking, before conducting their lessons, because identification of the cause is the first step of remedy. This study analyses students' conceptions that underlie the errors they make in algebraic expressions under two categories of conceptual knowledge: knowledge of general principles and knowledge of principles underlying these procedures.

Method- This study employs a sequential explanatory mixed method design, comprising a mathematical test, followed by interviews of students. It tested 362 ninth grade students from five lower secondary schools in Kampong Speu province and Phnom Penh city, of whom, 24 were selected for interviews.

Findings- The results revealed that most of the errors occurred because of students' insufficient understanding of algebraic concepts and modelling algebraic expressions. The major misconceptions underlying these errors included: x always represents 1, and $-x$ is a negative number due to the negative sign attached. However, while students had conceptions on solving daily life problems, they struggled to solve them mathematically.

Significance- For understanding students' errors and misconceptions, as well as improving their learning outcomes, it is worth the time, money, or effort spent; of value or importance to design effective teaching strategies. However, rather than just generating awareness of errors made by students, this study also sheds light on how students think and what they can do. Thus, understanding students' conceptions will be crucial for teachers while designing a good lesson plan, and will improve learning outcomes more effectively.

Keywords: Algebraic expression, Conception, Conceptual knowledge, Error, Misconception.