

LETTER AS OBJECT MISCONCEPTION IN JUNIOR SECONDARY SCHOOL ALGEBRA

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The *letter as object* misconception in algebra has been reported in the literature for about 30 years; for example, Rosnik (1981) and Clement (1982). MacGregor & Stacey (1997) and Chick (2009) noted the use of “fruit salad algebra” (that is, the letter a stands for the object apple and b for bananas) in several Australian textbooks. MacGregor and Stacey found that the students at one school were adversely affected by the use of a textbook which taught that letters can be used as abbreviated words and labels. Despite known problems, this discredited teaching strategy persists.

In this study we analyse students’ responses to a particular online assessment within the *smart test system*. This assessment system (www.smartvic.com/smart/index.htm) is designed to provide teachers with diagnostic information about their students’ understanding, as well as the presence of any misconceptions, so that they can prepare teaching to address student needs. The data for this study came from 850 Australian students from early secondary school, Years 7 to 9. These students completed three items which were designed to detect the *letter as object* misconception.

Not surprisingly, performance improved from Year 7 to Year 9 on each of the three test items. However, on average, only 43% of Year 9 students were correct on each item. We conclude that between 50% and 70% of Year 7 students bring the *letter as object* misconception to their learning of algebra and that about half of Year 8 and one quarter of Year 9 students in this sample have this misconception. The smart test system was designed to make the results of mathematics education research readily available to teachers. We expect that the information provided to teachers about their own students will increase teachers’ pedagogical content knowledge in the particular topic, so that they can provide teaching to remove such known misconceptions.

References

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