

You Can Do Maths: Introductory Maths For Tertiary Students

Language, Mathematics and English language learners

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Introduction

Mathematics is sometimes referred to as a 'universal language', implying anybody with mathematical understanding can solve mathematical problems regardless of the language they speak. While arithmetical notations may be mutually understood across some languages—although certainly not all—most mathematical tasks that learners encounter in school are not 'language free'. Moreover, the language required to make sense of those tasks is not the same as the language encountered in other parts of a learner's school day. The mathematics classroom generates its own complex mix of everyday language and discipline specific language and mastery of this is key to success in the mathematics classroom. The shift between everyday and specialist mathematical language is regarded as key to the development of mathematical understandings. This is evident in most mathematics curricula, which focus on everyday language in the junior grades and specialist language in senior grades (ACARA, 2012; Barwell, 2012).

Whilst all learners find the shifts in language use in the mathematics classroom challenging, it is particularly problematic for learners who speak *English as an additional language or dialect* (EAL/D) as they are learning the English language at the same time as they are learning mathematics through that language. Given the growing numbers of EAL/D learners in US, UK and Australian classrooms understanding the language challenges that mathematical problem solving presents to EAL/D learners is a skill all mathematics teachers must develop.

This challenge for English language learners is acknowledged in the latest curricula in the USA Common Core Standards and the Australian Curriculum, but ways to manage these challenges are not proffered. The preamble to the Common Core Standards for Maths warns,

It is also beyond the scope of the Standards to define the full range of supports appropriate for English language learners and for students with special needs. At the same time, all students must have the opportunity to learn and meet the same high standards if they are to access the knowledge and skills necessary in their post-school lives (Common Core Standards State Initiative, 2012).

Similarly the new *Australian Curriculum: Mathematics* begins with the following statement:

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