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Vincent, Jill; Bardini, Caroline; Pierce, Robyn; Pearn, Catherine

Misuse of the equals sign: an entrenched practice from early primary years to tertiary mathematics.

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Summary: In this article, the authors begin by considering symbolic literacy in mathematics. Next, they examine the origins of misuse of the equals sign by primary and junior secondary students, where “=” has taken on an operational meaning. They explain that in algebra, students need both the operational and relational meanings of the equals sign. When substituting numbers for pronumerals in an algebraic expression, students are able to rely on their operational understanding to evaluate the expression. Similarly, it is possible for students to solve algebraic equations such as $2x + 3 = 11$ without recourse to the relational meaning, for example, by a guess and check approach. However, if they fail to understand that the expressions on each side of an equation are equal, then they have difficulty, for example, understanding why x can be subtracted from both sides when solving the equation $2x + 3 = x + 11$. Researchers have found that students who understand that the equals sign is a relational symbol of equality are more successful in solving algebraic equations. The remainder of the article examines a sample of the written solutions of first semester undergraduate students demonstrating inappropriate use of the equals sign in a major Australian university’s Calculus 1 course. The article concludes that the notion of expecting symbols to have meaning and a habit of checking the meaning of the symbols used is an aspect of working mathematically that needs to be cultivated at all levels: primary, secondary and tertiary. In particular, ensuring that students understand the relational role of the equals sign is an important step in developing symbol sense. (ERIC)

Classification: H20 H30 E40

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