META-ANALYSIS AND SYSTEMATIC REVIEW OF THE EFFECT OF LANGUAGE PROFICIENCY ON STUDENTS’ MATHEMATICS LEARNING OUTCOMES

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Many researchers have found students’ mathematics learning achievement correlates with various factors. To investigate the specific effects of language proficiency on students’ mathematics learning outcomes, a meta-analysis and systematic review was conducted. Following an exhaustive search for studies meeting specified selection criteria, 41 correlations were extracted from 27 studies published between 1999 and 2015 in eight countries involving 180,527 participants. Students’ educational levels ranged from kindergarten to college. Studies measured participants on different aspects of language and mathematics. The meta-analysis shows an overall positive correlation in the relationship between language proficiency and mathematics outcomes ($r = 0.410; 95\% \text{ CI}, 0.337-0.478$). A moderator analysis was also conducted to explore the effects of various moderating factors on the correlation between language proficiency and mathematics outcomes under various conditions. Moderating effects were generally significant. These findings have significant implications for curriculum design in mathematics education.