



## Private Tutoring and Mathematics Education: A Review of the Current Research Landscape and Future Directions

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Private tutoring, especially in mathematics, has grown rapidly in countries like Australia, China, South Korea, and Japan. Defined as fee-paying supplementary lessons, tutoring is often perceived to be effective in enhancing students' academic performance. However, its rapid growth has led to critical concerns regarding its effectiveness and influence on wider society. While tutoring is often praised for enhancing students' academic performance, there is a lack of current research concerning its effectiveness and impact on student's learning. In Australia, the tutoring market is estimated to be worth over billion dollars. Whilst there is no data on students participation rates, estimates suggest nearly 40% of Australian pupils engage in tutoring however access remains uneven across SES groups. Concerns have also been raised about the lack of regulation of the tutoring industry given tutoring's potential to undermine formal education and exacerbate academic competition.

Current research on the effectiveness and impact of tutoring remains inconclusive. While some studies report significant gains associated with tutoring, others indicate minimal or no improvement. It is widely acknowledged that tutoring effectiveness is highly context-dependent, shaped by factors like tutor quality, instructional design, student motivation, and the broader educational environment. Furthermore, ongoing debates persist regarding what constitutes effective tutoring. Whereas many studies focus exclusively on academic achievement, others argue that students' psychological development should also be considered. In many studies, effective tutoring is assessed based on short-term academic gain only. This perspective overlooks broader educational goals in mathematics learning such as reasoning skills, motivation, and confidence. Meanwhile different stakeholders may prioritise distinct criteria in evaluating the effectiveness of tutoring. As such, one size fit all definition is inadequate. Factors like prior knowledge, learning needs, and affective development must also be considered in evaluating tutoring's effectiveness and influence.

In light of above discussion, it is recommended that evaluations of tutoring effectiveness extend beyond academic outcomes to include students' cognitive and affective development and tutoring's societal impact. This approach enables a more holistic understanding of tutoring's influence on student learning, school teaching, and society at large. Furthermore, stronger collaboration among researchers, teachers, and government bodies are essential to identify and address gaps relating to tutoring. Importantly, stakeholders should devote more attention in researching, understanding, and addressing issues associated with tutoring to enhance and sustain students' learning experience.