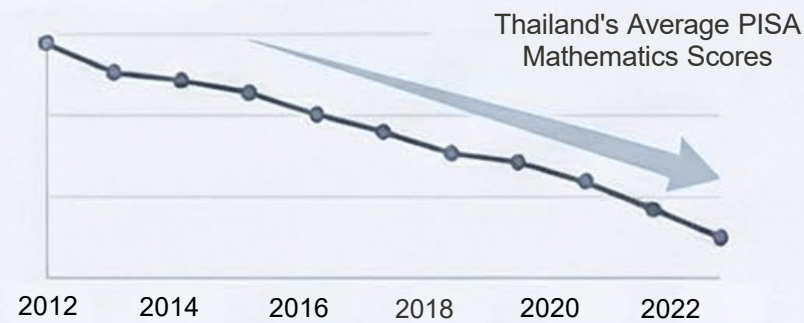


A Synthesis of Teaching Methods Affecting Mathematics Achievement: Meta-Analysis and Network Meta-Analysis

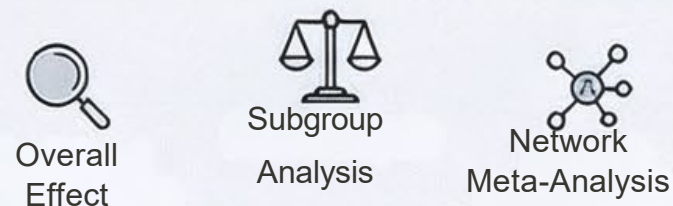
Overview of the Research Methodology

The Issue: A Significant 30-Point Drop in PISA Mathematics Performance

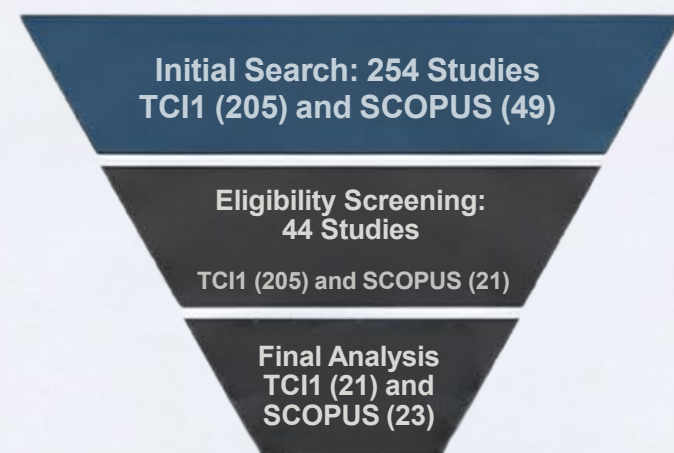


Thailand's average PISA mathematics scores have shown a continuous decline from 2012 to 2022, highlighting a search for more effective teaching methods.

Meta-Analysis Approach

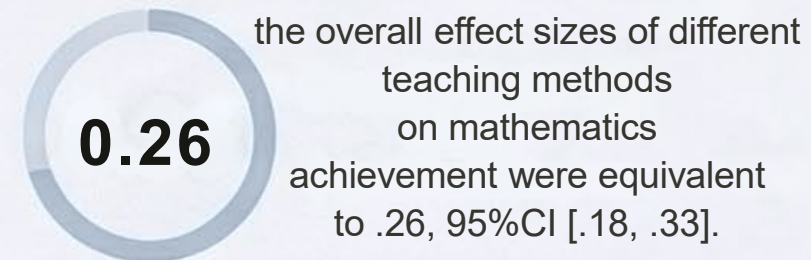


Results of Study Selection Based on PRISMA Guidelines

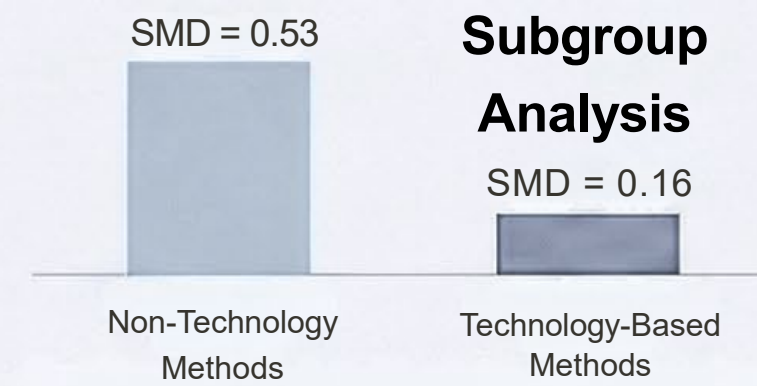


Egger's regression test showed that 44 studies (117 tests) met the inclusion criteria, of which 36 studies (94 tests) were suitable for analysis.

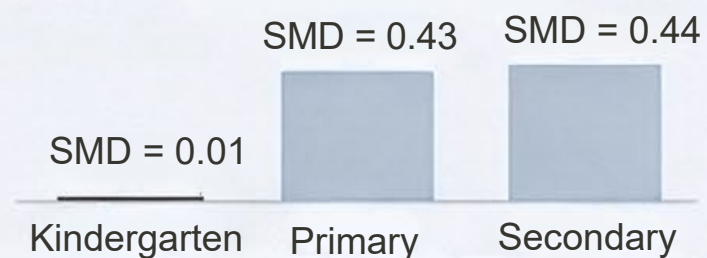
Key Factors Influencing Math Achievement



Teaching methods that did not use a technology base had a significantly larger effect size.



Student Education Level

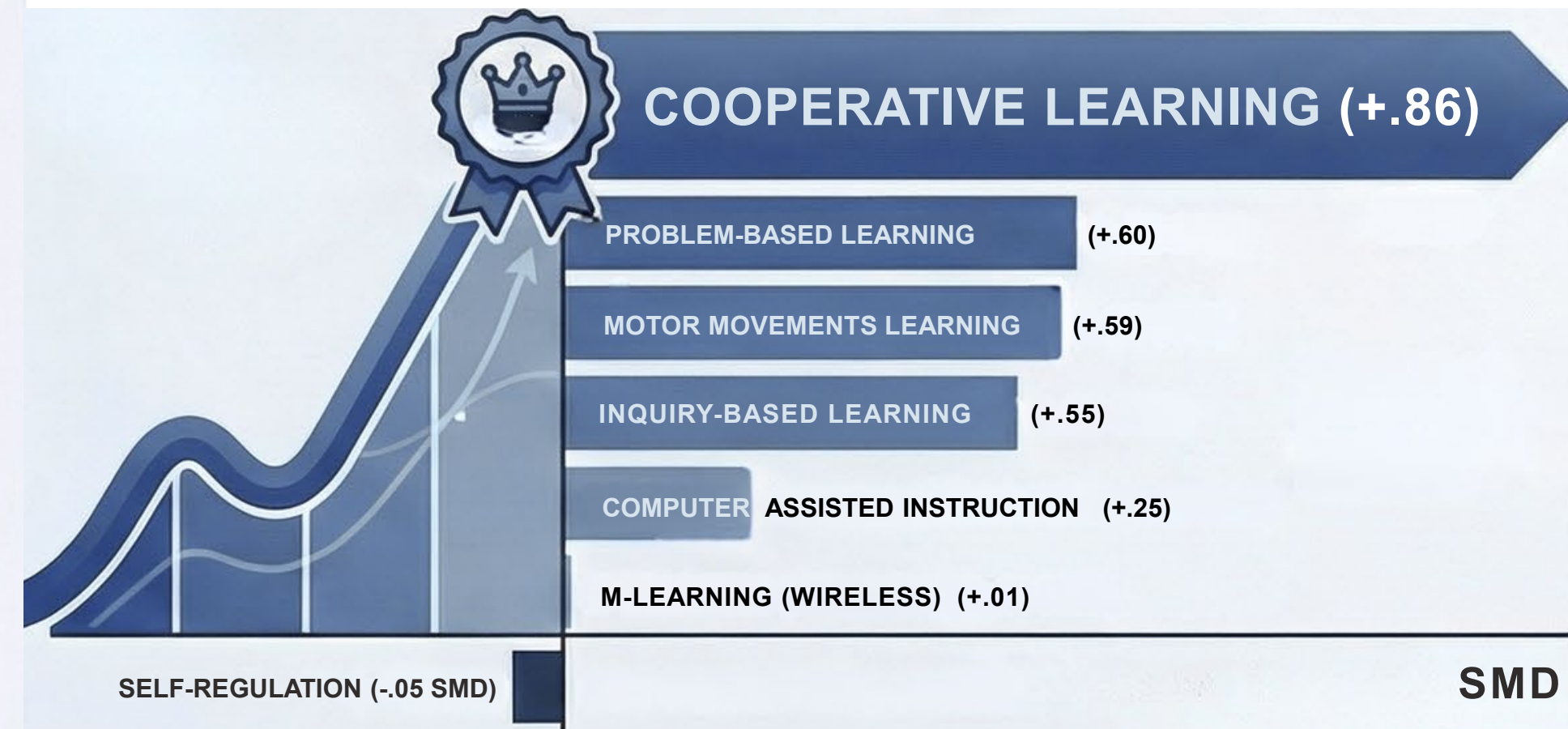


The impact of teaching methods was significantly lower for kindergarten students.

Intervention length showed no significant impact, with no statistically significant difference between short-term (<30 hrs) and long-term (>20 hrs) interventions.

Effect size comparisons of math instructional methods vs. traditional teaching (forest plot)

Compared to traditional teaching, Cooperative Learning demonstrated the largest positive effect on math achievement.



the comparison of effect sizes between the difference teaching methods though the network meta-analysis revealed that the difference in effect size between co-operative learning and traditional proved the most significant which was .86, 95%CI [.70, 1.03]