

## Evidence for Learning Summary

There was not strong evidence that QuickSmart Numeracy (QuickSmart), as experienced in this trial, had an additional impact on maths achievement. Overall and for Primary students<sup>1</sup>, on average, there was one month's additional gain in maths but this was not statistically significant and needs to be treated with caution.<sup>2</sup> There was some evidence of greater learning gains for students when more QuickSmart sessions were received, but the finding was not statistically significant as the number of students who received more sessions was too small. Schools experienced difficulties achieving the full program of 90 sessions over 30 weeks, so this trial was not able to determine whether QuickSmart is effective when it is delivered as prescribed.

Implementation of QuickSmart appears to be more feasible in Primary schools and there was strong evidence of impact on maths self-concept and interest, but these were not translated into self-efficacy. The same benefits were not found for Secondary students.

### Program summary

QuickSmart is a supplemental maths program delivered in 90 sessions over 30 weeks to develop students' automaticity and fluency in basic maths operations (addition, subtraction, multiplication and division).

### Program Developer

SiMERR National Research Centre, University of New England

### Independent Evaluator

Teachers and Teaching Research Centre, University of Newcastle

### Type of Trial

Effectiveness

### Students

288 (Years 4 & 8)

### Schools

23

### Program Grant

\$500,000

### Evaluation Grant

\$186,000

### Costs

\$ \$ \$ \$ \$ \*

### Security

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### Months Impact

+1

\*When staffing release costs to attend training are included, the cost rating for QuickSmart is Moderate.





<sup>1</sup> The terms 'primary' and 'secondary' will be capitalised when referring to schools or Year levels, and lowercase when referring to outcomes, in order to avoid confusion.

<sup>2</sup> Evidence for Learning has developed a plain English commentary on statistical significance to support readers in interpreting statistical results in our reports.

## The program and schools involved


QuickSmart was developed by SiMERR National Research Centre, University of New England. Teacher Assistants (TAs) receive three two-day QuickSmart training days in the first year and four optional training days in the second and third years.

There were 23 schools (12 Primary and 11 Secondary) from the Diocese of Sydney in this trial. The ICSEA<sup>3</sup> of the majority of schools were marginally above the ICSEA national value of 1000 with Primary schools ICSEA mean at 1054 and Secondary schools at 1028. Students were identified in the bottom 30% of their national cohort in mathematics in the 2016 NAPLAN scores.

 Mode Supplemental program	 Delivered to students by Teacher Assistants	 Cost per student \$151*	 Intervention length 90 sessions over 30 weeks
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\*Excludes staff release costs to attend QuickSmart training and in delivering the program.

## Research results

Maths achievement	Effect size [95% CI]	Estimated months progress*	E4L security rating**	Number of students (Intervention, Control)	P value	E4L cost rating***
Combined Primary and Secondary	0.05 [-0.19, 0.30]	+1		287 (145, 142)	0.59	\$\$\$\$\$
Primary	0.08 [-0.28, 0.44]	+1	N/A	133 (67, 66)	0.48	\$\$\$\$\$
Secondary	0.01 [-0.33, 0.35]	0	N/A	154 (79, 76)	0.95	\$\$\$\$\$

\* Refer to Appendix A, used to translate effect size into estimated months progress.

\*\* Refer to Appendix B, for E4L independent assessment of the security rating.

\*\*\* When staffing costs are included, the cost rating for QuickSmart is Moderate.

<sup>3</sup> The Index of Community Socio-Educational Advantage (ICSEA) provides an indication of the socio-educational backgrounds of students and is set at an average of 1000. The lower the ICSEA value, the lower the level of educational advantage of students who go to this school.

## Evaluation conclusions

1. In this trial, QuickSmart did not have an additional impact on maths achievement compared to regular classroom instruction and support. There was a small positive gain, equivalent to one month's additional learning, however this trial was not commissioned to detect this level of difference<sup>4</sup> meaning the difference was not statistically significant.
2. When models were adjusted for intervention exposure, there was a small increase in the effect on student achievement (indicating that exposure levels have some effect on outcomes), however this effect was not statistically significant.
3. Sub-group analysis displayed a small but not statistically significant positive effect for Primary students. The gain was equivalent to one month's additional learning. There was no additional effect for Secondary students.
4. Schools faced challenges achieving the prescribed program exposure of 90 sessions within 30 weeks. Primary students, on average, received 73% (or 66 sessions) of QuickSmart's prescribed 90 sessions over 30 weeks, while Secondary students received 49% (or 44 sessions). Only 35% of Primary students and 4% of Secondary students received more than 75% (or 67 sessions) of the prescribed QuickSmart sessions.
5. Sound implementation of QuickSmart appeared more feasible within Primary schools than Secondary schools. Both settings struggled with transitions into and out of the classroom, and concern about the subject matter students were missing out on as a result of QuickSmart was expressed across Primary and Secondary settings.
6. Primary teachers were positive about QuickSmart and reported that it appeared to help students gain more confidence participating in their maths classrooms. QuickSmart had a statistically significant positive impact on Primary students' maths self-concept (effect size  $g = 0.30$ ) and interest in maths (effect size  $g = 0.47$ ), however there was no evidence of impact on self-efficacy (effect size  $g = 0.09$ ). There were no statistically significant intervention effects on Secondary students' cognitive and affective outcomes.

## Main findings and impact

This trial did not produce significant evidence that participation in the QuickSmart program had a positive effect on the average mathematics achievement beyond participating in regular classroom-based mathematics instruction.

In this trial, intervention group and control group received the same amount of time in which to demonstrate improvements, and there was no continuation of QuickSmart sessions beyond the single school year. Because of this important design feature for controlled trials (equal time among groups), and the trial processes of recruitment and testing, not all schools recruited had access to the 30-week intervention period required to undertake the complete intervention volume of 90 sessions. Of the 23 schools involved, 12 (52%) had access to 30-weeks of intervention time, eight (35%) had 28 – 29 weeks, two (9%) had 26 – 27 weeks, and one (4%) had only 23-weeks of intervention time. When comparing the average exposure to the program for this trial against exposure reported from 2013 – 2016 by SiMERR (Pegg et al., 2013, 2014, 2015, 2016), trial average exposure was marginally greater among the Year 4 cohort (Trial = 73%; SiMERR = 66%), and marginally lower among the Year 8 cohort (Trial = 49%; SiMERR = 55%).

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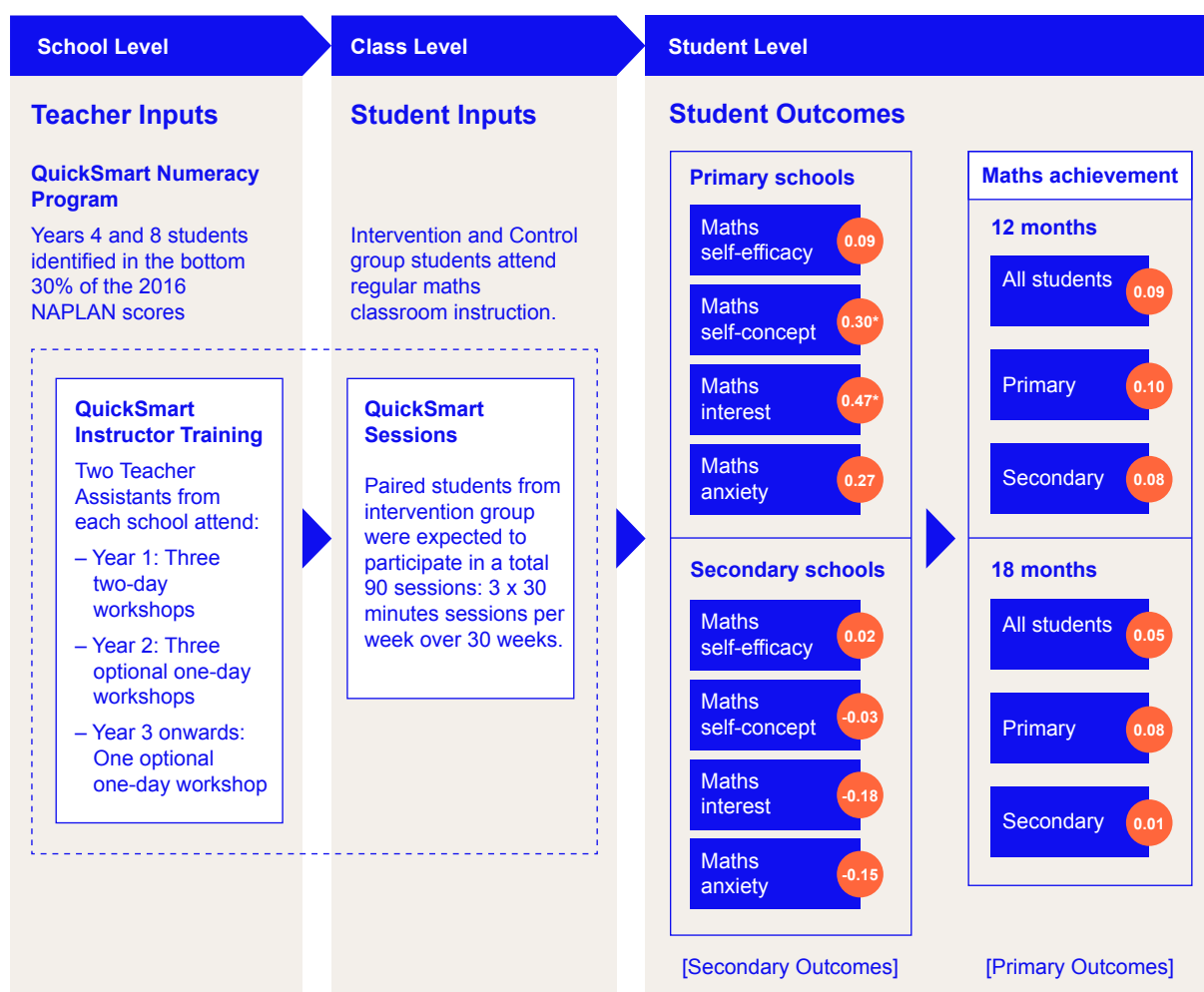
<sup>4</sup> This trial was powered to achieve a Minimum Detectable Effect Size (MDES) of 0.24 at randomisation, which meets the high padlock rating criteria for MDES of <0.3.

When models were adjusted for intervention exposure, there was a small increase in the effect on student achievement, and there were also signs of stronger effects in the Primary school context (equivalent to one month of additional learning progress)<sup>5</sup>, than observed among the Secondary schools. Whilst neither of these findings were statistically significant, they do indicate that exposure levels appear to have some effect on outcomes.

QuickSmart displayed positive effects on the cognitive and affective measures of mathematics self-concept and mathematics interest among the Primary cohort. The process evaluation highlighted that instructors, teachers and students valued the intervention, reporting a positive effect on students' confidence in mathematics, and adding support for the quantitative outcomes.

Schools reported disruption for students as they transitioned between the classroom and QuickSmart instruction as well as reduced learning time in other subject areas due to QuickSmart sessions. Primary schools in our evaluation appeared better able to implement the QuickSmart intervention, with students able to participate in a greater volume of QuickSmart sessions on average than the Secondary cohort. QuickSmart Instructors in Primary schools were, on average more qualified and had more years of QuickSmart experience, perhaps leading to increased efficiency within Primary schools. Stronger implementation support for schools and coordination with classroom teachers may assist with the smooth and effective delivery of QuickSmart and help achieve the greatest possible return on investment.

The QuickSmart evaluation logic model with impact evaluation effect size results is below.



<sup>5</sup> Months progress is converted from the effect size using Evidence for Learning's conversion table (see Appendix A).

## How much does it cost?

QuickSmart costs \$10,500 (excl. GST) per school in the first year, which includes training, access to online resource and telephone support, equipment and resources, and a three-year license to the OZCAAS program required for delivery and assessment. The cost per student is estimated at \$151 per year, based on 25 students per year undertaking the intervention over three years. When costs for TA cover are included for QuickSmart training, the cost rating is \$1,007 per student. This evaluation is supported by the Sydney Catholic Schools, and the 23 schools involved were allocated funding of \$8,600 to support the implementation of the QuickSmart program and were not required to pay the standard start-up fees.



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