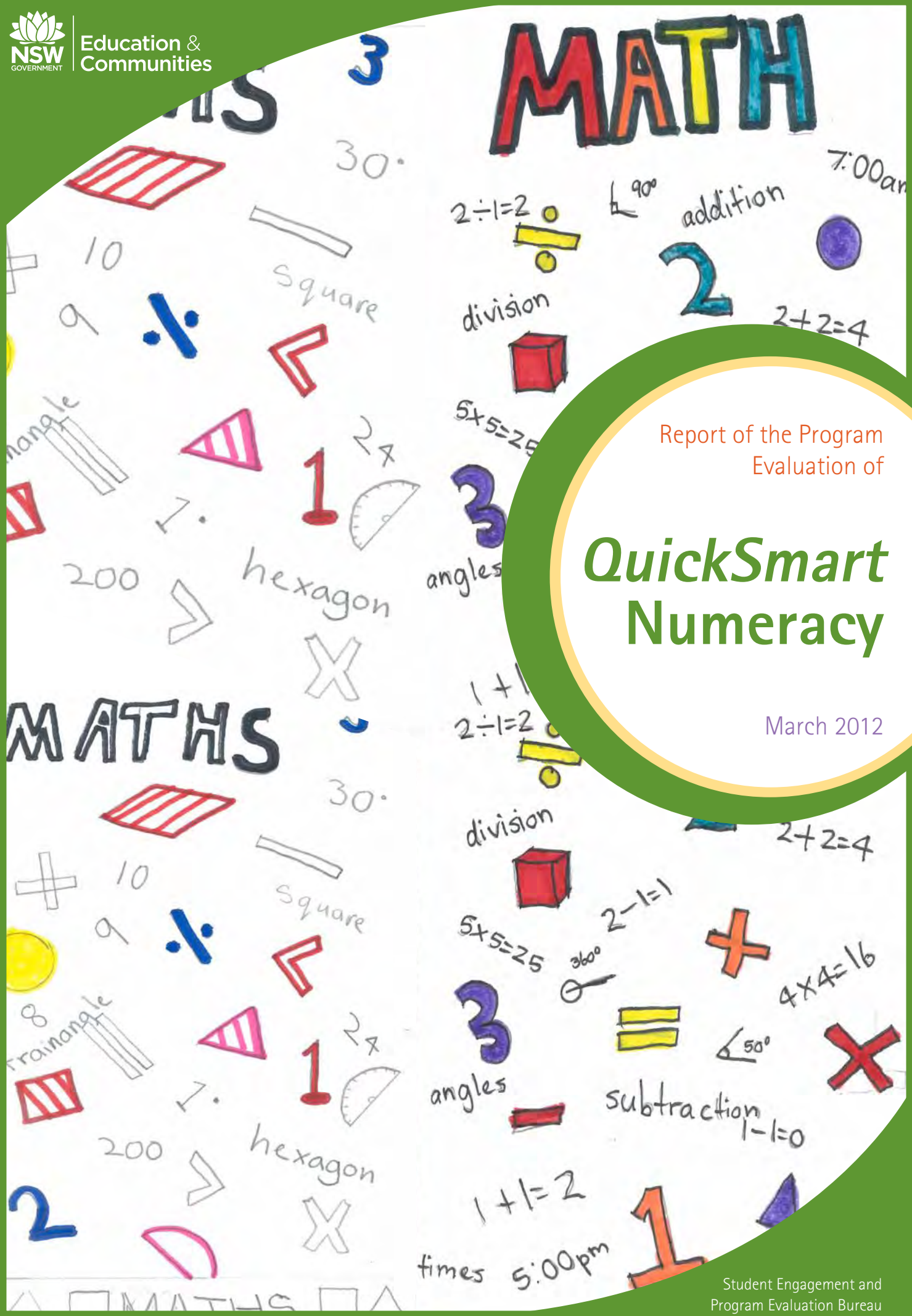




Report of the Program
Evaluation of

QuickSmart Numeracy

March 2012

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- | | |
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Executive summary

Program evaluation: *QuickSmart* Numeracy

NSW Department of Education and Communities¹ commissioned the Student Engagement and Program Evaluation Bureau to conduct an evaluation of *QuickSmart* Numeracy, one of several initiatives being funded under the National Partnership on Literacy and Numeracy (NPLN).

The Terms of Reference for the program evaluation of *QuickSmart* Numeracy required that the evaluation:

- assess the effectiveness of the program
- assess the extent to which the program achieves its goals in an efficient manner and where applicable, addresses the mandatory reform elements of the National Partnership on Literacy and Numeracy, which are:
 - effective and evidence-based teaching of literacy and numeracy
 - strong school leadership and whole-school engagement with literacy and numeracy
 - monitoring student and school literacy and numeracy performance to identify where support is needed
- assess the extent to which the program has improved the educational outcomes of Aboriginal students
- investigate the most effective ways for schools to be supported to participate in the evaluation and for the reforms to be incorporated into school practice.

Fourteen NPLN schools have chosen to implement *QuickSmart* Numeracy as their intervention targeting individual students who are experiencing difficulty with mathematics. Many of these schools have a high proportion of Aboriginal students.

QuickSmart Numeracy

The *QuickSmart* suite of programs has been developed by the University of New England to address both literacy and numeracy needs of middle years students (Years 5 to 8). Only the numeracy component was offered as part of the NPLN.

For the purposes of this report, *QuickSmart* will be understood to refer to the numeracy program only.

QuickSmart is a basic skills intervention designed for students who demonstrate persistently low achievement. The program aims to improve students' ability to easily and quickly recall number facts and perform basic computation skills, referred to as 'automaticity'.

QuickSmart is a research-based program that is supported, resourced and built around a professional learning program for principals, supervising teachers, teachers and teacher aides. The program emphasises both deliberate practice and strategy instruction in basic mathematics.

In the *QuickSmart* program, pairs of students participate in 30-minute lessons, three times a week for 30 weeks.

National test data provide a compelling case for the need to implement research-based programs that improve the numeracy outcomes for students who are performing at or below the National Benchmarks.

¹ On 3 April 2011, the NSW Government changed the name of the Department of Education and Training to the Department of Education and Communities. In this document, a reference to the Department of Education and Training is to be construed as a reference to the Department of Education and Communities.

The *QuickSmart* program fills some of the identified gaps in research and practice. The *QuickSmart* program was designed as a long-term program for middle school students performing in the lowest 30% of the achievement range, who need to improve their basic mathematics skills. The program targets those students who have been unable to draw benefits from other in-class and withdrawal instructional activities (NSW, 2009a).

Evaluation methodology

The evaluation methodology comprised the following components:

- knowledge review: a review of program documentation relating to *QuickSmart*
- stakeholder interviews with program developers
- online survey of teachers in all 14 schools that implemented *QuickSmart* as their individual-student intervention
- visits to four of the 14 schools, to conduct interviews and focus groups with school principals, leaders, teachers, students, parents and community members
- analysis of school documentation including school Numeracy Plans and Annual School Reports
- analysis of National Assessment Program - Literacy and Numeracy (NAPLAN) and National Partnership on Literacy and Numeracy (NPLN) assessment data.

The methodology was developed in consultation with, and approved, by the NPLN Program Evaluation Reference Group (PERG).

Key findings

Evidence from all data sources indicates that student learning outcomes in numeracy have improved for students engaged in the *QuickSmart* intervention. This effect is more strongly supported by teachers', parents' and students' impressions of effective learning, than by broad-scale testing measures.

Other major findings relate to the implementation of the program, impacts on teacher work practices and on the school as a whole, and issues of sustainability. These are detailed in the following sections.

Implementation of *QuickSmart* Numeracy

Ease of implementation, resources and assessment software were instrumental in schools' decisions to implement *QuickSmart* as their individual-student intervention.

Program choice and selection of students

Schools targeting numeracy as their NPLN programs had only two individual-student interventions to choose from: *Taking Off With Numeracy (TOWN)* and *QuickSmart* Numeracy. Several schools were already implementing *QuickSmart* Numeracy at the commencement of NPLN, so chose to continue and expand the program.

In each school, places in the *QuickSmart* program were limited. Selection of participants was usually based on perceived need, determined by NAPLAN or other assessment data. Concerns were raised in several schools about the appropriateness of this method, suggesting that discussions with teachers as to who might benefit most, should also be used to inform the decisions.

Staff and training

Finding suitable tutors was regarded as the critical influence on the success of the program. Some schools chose to re-direct existing school support staff to act as *QuickSmart* tutors; others employed tutors, often parents from within the school community.

Teachers and tutors participated in training provided by the *QuickSmart* SiMERR group, which included three, two-day sessions for teachers and support staff. A one-day workshop was also provided for principals. This training was seen to be effective, although expensive.

Some support was provided to schools by the National Centre of Science, Information and Communication Technology and Mathematics Education for Rural and Regional Australia (SiMERR) at the University of New England, as well as by regional and diocesan consultants. The level of support available was determined by each sector on a regional or diocesan basis.

The *QuickSmart* Cognitive Aptitude Assessment System (CAAS) was seen by students as engaging, as well as providing useful feedback on student progress to both staff and students.

Managing *QuickSmart*: learning spaces, computers and timetables

The role of the *QuickSmart* coordinator was critical in solving challenges around access to suitable rooms and computers, and in creating timetables that provided continuity for students, and balanced students' time away from classes with the number of sessions each tutor could do in a day or week.

Effects for students

Both data sets (NAPLAN and NPLN assessments) demonstrated improvement in numeracy performance for students in *QuickSmart* schools. A range of limitations on the reliability and validity of results observed in these data sets have been outlined in this report; these should be considered when drawing conclusions from the results discussed.

As the majority of students participating in *QuickSmart*, are in Years 5 or 6, the influence of *QuickSmart* on student performance is highly unlikely to be evident in these results.

Principals, school leaders, teachers, students and parents all identified positive impacts of *QuickSmart* on student learning outcomes in numeracy. Improvements were also reported in other aspects of learning, such as: enjoyment of and engagement in numeracy activities; greater willingness to participate in class activities; improved social skills and behaviour; and better attitudes to homework.

Outcomes for Aboriginal students

Both data sets (NAPLAN and NPLN assessments) also demonstrated improvement for Aboriginal students in *QuickSmart* schools.

Most teachers and tutors reported improved numeracy outcomes for all Aboriginal students, as a result of their participation in *QuickSmart*. Other academic and social outcomes were also observed, including improved attendance, increased participation in class activities, as well as increased self-esteem, confidence and improved behaviour.

Teacher and tutor perspectives

Most staff agreed that the program was effective in meeting the needs of most or all of the targeted students. Teachers reported some difficulties with the withdrawal program; mostly in terms of the disruption to lessons and the difficulty some students face in rejoining class lessons.

The *QuickSmart* professional learning program was judged to be effective. However, only one or two schools trained all their teachers. Others schools gave priority to program coordinators and tutors or support staff who would work directly with students. Class teachers in these schools reported that they had, at least, become familiar with the *QuickSmart* strategies, and saw value in their use with all students.

Impacts on whole-school practices

The introduction of *QuickSmart* appears to have had minimal impact on overall school culture. Nevertheless, some key impacts identified by principals included: strengthening of relationships between the school and community; improved attitudes to mathematics among students; and teachers reflecting on the potential benefit of using the *QuickSmart* strategies with students in class numeracy lessons.

Factors leading to success

Several factors were identified as contributing to the program's overall success. These included:

- selecting and retaining the right tutors
- building strong relationships: between the school and the tutors; between teachers and tutors; and between tutors and their students
- regular monitoring of student progress using school-based assessments, *QuickSmart* CAAS assessments and, to a lesser extent SMART data
- quality training, promoting teacher and tutor confidence in implementing *QuickSmart*
- establishing a *QuickSmart* coordinator to provide dedicated program support to tutors, students, teachers, and parents.

Sustainability

While *QuickSmart* is labour-intensive and complex to organise, its results are impressive. This, and the potential to expand practices beyond the student-withdrawal program, made it an attractive proposition for the NPLN schools to maintain beyond the period of funding.

Four factors are identified as being critical to the sustainability of *QuickSmart* in schools:

- securing a funding source for ongoing employment of tutors
- supporting the *QuickSmart* coordinator with relief time, to complete the complex management tasks
- providing additional resource kits
- ensuring a strategy for ongoing training for new teachers or tutors.

The main obstacle to continued implementation of *QuickSmart* was the substantial funding required to employ tutors.

Three distinct possibilities emerged:

- obtaining additional funding from a new external source, or cancelling the program
- identifying a funding source within the existing school budget
- incorporating the tutoring role within the workload of support teachers, or relying on volunteers.

Each of the principals in the schools visited, confirmed that it's likely that they would 'find' alternative funds to maintain the individual-student intervention.

Part 1 Introduction

This evaluation report is presented in two parts:

Part 1 provides the background to the *QuickSmart* Numeracy program evaluation and to the *QuickSmart* program itself.

Part 2 details the findings and conclusions of the evaluation.

1 Evaluating *QuickSmart* Numeracy

QuickSmart Numeracy is one of four literacy and numeracy programs evaluated by the Department's Student Engagement and Program Evaluation Bureau, under the National Partnership on Literacy and Numeracy (NPLN).

1.1 Policy context

The NPLN aims to bring about sustainable improvements in the reading and numeracy achievement of students in NSW schools. 'Closing the Gap' for Aboriginal students and improving outcomes for individual students experiencing difficulty in numeracy, are specific program targets.

The partnership is operating over the four-year period from 2009 to 2012, to facilitate and reward literacy and numeracy models or approaches that support teachers and demonstrate evidence of accelerating improvement in student learning achievement.

The focus is on development of:

- effective, evidence-based teaching
- strong leadership and whole-school engagement in literacy and numeracy
- effective use of student performance information to identify where support is needed.

Schools in all three education sectors in NSW (government, independent and Catholic) were identified for participation, using a range of criteria including:

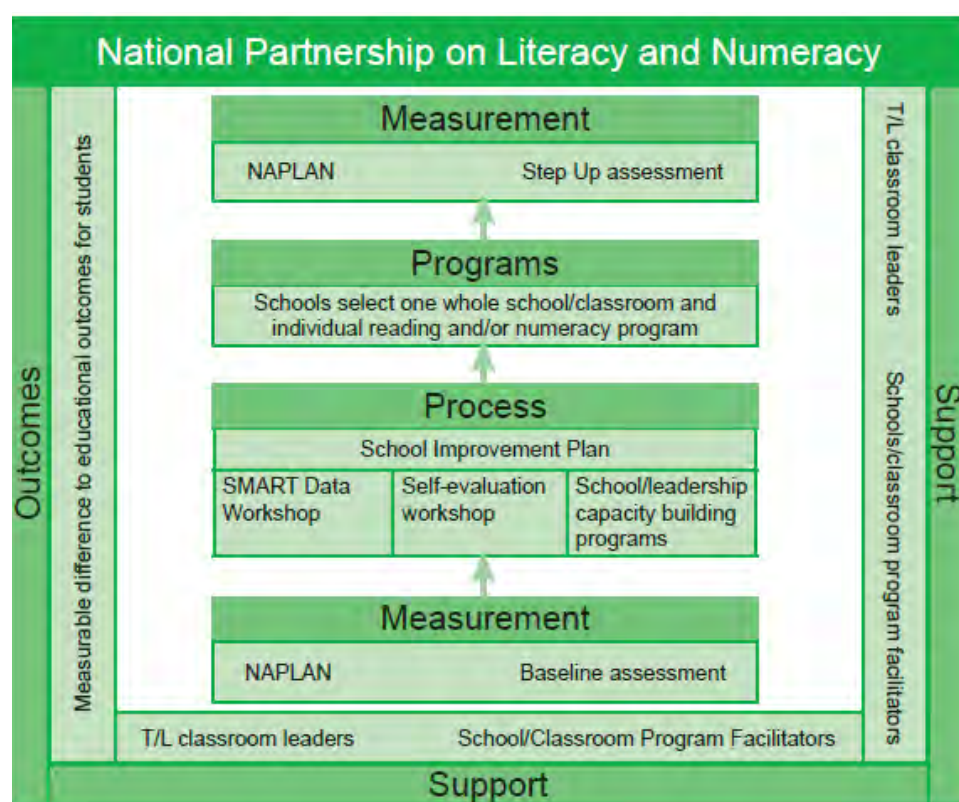
- the 2008 National Assessment Program - Literacy and Numeracy (NAPLAN) data: schools where the percentage of all students in Years 3 and 5 at or below minimum standard is above the state percentage in reading and numeracy
- the school's suitability and readiness to participate in the NPLN, as advised by regional and diocesan offices
- each school's student background characteristics, including: enrolment; student language background; student enrolment data, for instance, proportion of refugee students or Aboriginal students; and the degree of disadvantage of the school or group of schools.

Participating schools were allocated funding, tied to the reform priorities, to review and refine their school improvement plan. Schools were expected to use their funding to:

- undertake a self-evaluation on reading or numeracy
- involve the school leadership team in a leadership capacity-building program
- implement an intervention program targeting individual students in Years 3 to 6 who are experiencing difficulty in reading or numeracy
- implement an intervention program at a whole-class level in Years 3 to 6
- focus on improving teaching and learning in Years 3 to 6, by having teachers participate in a sustained professional learning program on reading or numeracy.

Each school was required to complete professional learning in the use of SMART data and school leadership capacity building as part of the NPLN. Teachers were expected to complete the online *Data Analysis Skills Assessment* (DASA) to gauge their own development of skills in analysing data and using results to inform practice.

Figure 1.1: National Partnership on Literacy and Numeracy implementation model
(NSW Government, 2009a)



Within the context of the school improvement plan the funding could also be used to:

- support staff to participate in a local Aboriginal cultural awareness program
- provide release for collaborative programming, resource development, shared reflection and team teaching
- work with school *QuickSmart* tutors or teaching and learning leaders
- purchase equipment or resources essential to the implementation of the professional learning program, or
- employ teacher aides where they are essential to the implementation of an intervention.

A total of 147 schools in NSW participated in a range of programs offered under the NPLN. Some of these programs have been developed internally by NSW Department of Education and Communities (DEC), others by the Catholic education sector, and others by external developers. Each program targets literacy or numeracy, taking either an individual-student or a whole-class approach, and has been included on the basis of a sound evidence base that supports its potential to achieve the intended improvements.

Numeracy programs that take a balanced approach to teaching numeracy were selected. Programs were chosen that are designed to accelerate student outcomes in number and multi-unit place value (NSW Government, 2009c).

1.2 *QuickSmart*

The *QuickSmart* suite of programs has been developed by the University of New England to address both literacy and numeracy needs of middle years (Years 5-8) students. Only the numeracy component was offered as part of the NPLN.

For the purposes of this report, *QuickSmart* will be understood to refer to the numeracy program only. If there is a need to distinguish between the two programs, both *QuickSmart* Literacy and *QuickSmart* Numeracy will be referred to in their full forms.

QuickSmart was nominated within the NPLN Agreement as one of the programs to be evaluated by the Program Evaluation Unit of the Department's Student Engagement and Program Evaluation Bureau (SEPEB).

Thirteen public schools, across four regions, implemented the *QuickSmart* program through participation in the NPLN. Of these, three schools participated in the qualitative field visit component of the evaluation.

One Catholic Education Commission school chose *QuickSmart* as their individual-student intervention program for numeracy, and was included in qualitative field work.

A description of the *QuickSmart* program is provided in Section 2.

1.3 Evaluating the literacy and numeracy programs

The NPLN Cross-sectoral Working Group determined that eight of the available programs would be formally evaluated. It was agreed that only programs with seven or more participating schools would be involved in the evaluation.

The following criteria were used to determine whether each program evaluation would be conducted within the DEC or by an external evaluator:

- The four literacy and numeracy programs developed by organisations outside education systems were evaluated by SEPEB.
- Literacy and numeracy programs developed within education systems (three programs) were evaluated by an external evaluator, Urbis Pty Ltd.
- *MultiLit* was evaluated by Urbis Pty Ltd.

Independent sector schools were not involved in the NPLN program evaluations.

The purpose of the program evaluations is to assess the effectiveness of the selected literacy and numeracy programs, as defined in the Terms of Reference of the evaluation, below.

1.4 Terms of Reference for the evaluation

The Terms of Reference for the program evaluation of *QuickSmart* required that the evaluation:

- assess the effectiveness of the program
 - assess the extent to which the program achieves its goals in an efficient manner and where applicable, addresses the mandatory reform elements of the NPLN, which are:
 - effective and evidence-based teaching of literacy and numeracy
 - strong school leadership and whole-school engagement with literacy and numeracy
 - monitoring student and school literacy and numeracy performance to identify where support is needed
- assess the extent to which the program has improved the educational outcomes of Aboriginal students
- investigate the most effective ways for schools to be supported to participate in the evaluation and for the reforms to be incorporated into school practice.

1.5 Methodology

The *QuickSmart* program evaluation employed a mixed-method design, drawing on both quantitative and qualitative components, as described in the following sections.

The evaluation was undertaken during the second full year of implementation of the *QuickSmart* program. At this early stage in the program, the most credible data comes from the experiences of participants and results of in-school assessment of student achievement. In addition to a survey of teachers, qualitative methods have been employed as they allow greater depth of enquiry, placing value on the accounts of teachers, school executive members, students and parent representatives.

The NPLN Program Evaluation Reference Group (PERG) was established to provide advice and guidance to the evaluation team. The evaluation methodology was approved by the PERG and each of the interview and observation schedules was developed in consultation with the expert members of the PERG.

1.5.1 Qualitative component

The qualitative component of the evaluation comprised:

- a review of program documentation for *QuickSmart*
- an interview with Professor John Pegg and Dr Lorraine Graham, program developers, from the National Centre of Science, Information and Communication Technology and Mathematics Education for Rural and Regional Australia (SiMERR), University of New England
- visits to four of the 14 schools implementing the program.

Background document review

Prior to the commencement of the evaluation, Program Evaluation team members undertook a thorough review of program materials and associated literature, to better inform their understanding of the program itself, and their interpretation of the evaluation data, especially that drawn from conversations with school staff and students.

Interview with program developers

Evaluation team members met with Professor John Pegg and Dr Lorraine Graham (SiMERR) at the commencement of the evaluation. They provided insights into the philosophy underpinning the development of both the *QuickSmart* program and the professional learning model. They also provided recommendations on the types of questions to direct to teachers, tutors and students.

School visits

The evaluation team engaged in a purposive selection of schools for fieldwork. A random selection of schools was not possible given the multiple literacy and numeracy programs in use across NSW, the small numbers of schools in some program cohorts, and the other commitments of some participating schools.

Schools to be visited were selected to provide a range of implementation contexts, in terms of:

- the size and location of schools, ensuring demographic diversity within the sample
- characteristics of student population, including the proportions of Aboriginal students, students from culturally and linguistically diverse backgrounds
- the mix of NPLN programs undertaken in each school
- schools' engagement with other initiatives under the Smarter Schools National Partnerships, including the National Partnership for Low SES Schools, to avoid logistical difficulties for the school.

Every attempt was made to ensure that selected schools were not involved in multiple other learning initiatives or funded programs.

In most cases, two members of the evaluation team visited each school for one day. Each visit included:

- an interview with the principal and relevant school leaders
- classroom observation of local program implementation, to allow students to meet evaluators prior to participation in the focus group
- focus groups with students
- group interviews with teaching staff
- group interviews with the local Aboriginal Education Consultative Group (AECG) and parent group representatives (where available)
- document review including the school plan and the school numeracy plan.

There are 13 public schools and one Catholic Primary School implementing the *QuickSmart* program through NPLN funding. Three public schools and one Catholic school were chosen for qualitative analysis.

One public school was unable to organise an evaluation visit due to school commitments and other demands on teachers and students. As an alternative, interviews were conducted by video conference with students, teachers and the principal. There was no classroom observation.

Table 1.1 provides a summary of sources of data collected across the seven schools.

Table 1.1: Summary of participation in school interviews

Methods	No of interviews	No of participants
Principal and school leaders	4	4
Classroom observations	3	n/a
Student focus groups	4	22
Teacher interviews	3	5
Tutor interviews	3	5
Parent and community interviews	3	6

The inclusion of Aboriginal parents and local community members was seen as an important part of the qualitative data gathering. Schools and local AECGs were contacted well ahead of time, and provided with information flyers regarding the evaluation for distribution to members of their community.

Data recording and analysis

All interviews and focus group sessions were recorded using both audio recording and note taking. Field notes and recordings were consolidated into a single record of interview, which was quality reviewed before analysis commenced.

Systematic coding commenced with an initial set of categories generated from the Terms of Reference and the background document review. Original categories were expanded and refined based on common issues and themes emerging from participants' responses. Counter-examples were sought, with recognition given to dissenting opinions, particularly from within teacher group interviews.

The narrative responses to the teacher survey were included in the consolidated data set for each program. In the case of *QuickSmart*, this coded data amounted to approximately 1050 individual thematic records. It is this material that has been used to provide the majority of the qualitative evidence of the evaluation.

1.5.2 Quantitative component

The quantitative component of the evaluation included an online survey for teachers, and analysis of the available student assessment data provided by the Department's Educational Measurement and School Accountability Directorate (EMSAD).

Teacher online survey

An online survey was made available to teaching staff in all 14 schools, to capture teachers' experiences and views on the effectiveness of *QuickSmart*.

The online survey was completed by a total of 17 school staff including some principals and school executive, from nine of the 14 schools implementing *QuickSmart*. Full results of the online survey are attached at Appendix 2.

Note that the sample size of 17 is relatively small and this limits the strength of the generalisations which can be made from the survey data. However, the feedback and opinions of those who did respond provide a valuable insight into their experiences of the program.

The charts and graphs used throughout this report present responses to the teacher survey.

NAPLAN and NPLN assessment data

In schools implementing *QuickSmart* as their individual-student intervention, the majority of students taking part in the program were in Year 5 or Year 6 (as demonstrated in Figure 3.1, p. 20). Accordingly, the influence of I on student performance is highly unlikely to be evident in these results. Analysis of the NAPLAN and NPLN assessments is provided in the interests of completeness of the evaluation.

A data model developed by EMSAD provided the quantitative analysis for the program evaluations. The Department holds data for both government and Catholic schools. The NSW Catholic Education Commission (CEC) authorised the preparation of this analysis by the Department for the purpose of this evaluation. The data model included NAPLAN and NPLN assessment data.

For NAPLAN assessments which occur only for Years 3 and 5 in primary school, a pre-NPLN benchmark was established using results for students in Year 3 in 2008 and 2009, for comparison with results of the same classes in Year 5 in 2010 and 2011, as shown in Table 1.2. Individual students cannot be identified and a significant turnover of students in some schools makes comparisons between students uncertain.

Table 1.2: Student performance assessment data sets

NAPLAN results			NPLN assessment results			
	Cohort 1	Cohort 2				
2008	Year 3					
2009		Year 3	April, 2009	Year 2	Year 3	Year 4
2010	Year 5		August, 2010	Year 3	Year 4	Year 5
2011		Year 5	August, 2011	Year 4	Year 5	Year 6

The preliminary NAPLAN data sets provided by EMSAD are provided as:

- test means and standard deviations
- gains in mean scores from Year 3 to Year 5
- percentages below, at and above National Minimum Standards.

The results are provided as aggregated for all NPLN program schools and also separated by program and by various cohort groups of students, as shown in Table 1.3.

Data for students for whom English is a second language (ESL) are not provided, due to a change in the use of that cohort group in the NAPLAN test data in recent years.

The key analysis in the use of the NAPLAN data is the effect size measure. Effect size is an indication of the meaning attached to a difference between the mean of a sample and the mean of the population from which the sample is drawn. Numerically it is the difference between the sample mean and the population mean, expressed as a proportion of the standard deviation for the population. It describes the effect of being in a program school on student performance.

Table 1.3: Aggregate data sets

Data set	Program comparison groups	Student comparison
NAPLAN	• Program schools (aggregated data for all NPLN schools implementing a given literacy or numeracy program) • All NPLN schools (literacy/numeracy) • All NSW	• All students • Boys • Girls • Aboriginal • Non-Aboriginal • LBOTE • Non-LBOTE
NPLN assessments	• Program schools (aggregated data for all NPLN schools implementing a given literacy or numeracy program) • All NPLN schools (literacy/numeracy)	• All students • Boys • Girls • Aboriginal • Non-Aboriginal • LBOTE • Non-LBOTE

In this analysis the population is 'all the students in the state' in most cases, but in other cases it is the students in schools in a NPLN program group, as will be evident in the tables and text throughout this report. The sample is, in most cases, 'all NPLN program schools' but it may be a cohort only, such as the boys or the Aboriginal students only.

An effect size of zero to 0.2 or -0.2 indicates that the means are virtually the same, and as such, the measure of performance is the same for sample and population. An effect size greater than 0.2 or less than -0.2 indicates that the mean of the sample is different from the population mean and the performance is different.

Positive effect sizes indicate a sample performance above the population performance, while negative effect sizes indicate that the performance of the sample is below the population performance. An effect size greater than 0.5 or less than -0.5, in other words a difference of half a standard deviation or more, indicates that the mean of the sample is very different from the population mean and the sample performance is well above or well below the population.

1.5.3 Limitations of the methodology

The major limitation in the design of this program evaluation comes from the short period of time between the commencement of the interventions in late 2009, and the points of data collection, both quantitative and qualitative, to mid-2011.

The NAPLAN data can only be viewed as a preliminary and incomplete set because of the program timeframe. For Cohort 1 (Table 1.2) the period of program implementation prior to the May 2010 NAPLAN testing in Year 5, allows an effect time of, at most, one full term of the program intervention.

EMSAD has advised that further caution should be exercised in interpreting the results of NAPLAN and NPLN assessments. A number of limitations impact on the validity of findings from the analysis, including:

- the variation in the focus of tests each year
- considerable student mobility
- small sample sizes for some comparison groups
- the impact of other literacy and numeracy initiatives operating in NPLN schools
- the use of these same programs in other NSW schools (not funded under the NPLN), and
- the lack of a comparable control group against which to benchmark results for NPLN schools.

The NPLN tests are adequate for whole-cohort assessment but are too brief to use for diagnostic assessment of individual students. As the NPLN tests are half the length of the Basic Skills Tests (BST) on which they are based, they cannot be used to compare with statewide performance on the former BSTs.

As NAPLAN and the NPLN tests are presented on different scales the results of these two assessments cannot be compared.

The use of qualitative methods, as well as performance measures or surveys, provides a balancing effect, allowing the experiences of teachers, students and parents to be presented for interpretation by others. Qualitative methods do not seek to identify a simple consensus or give extra weight to frequent comments or repeated evidence of similar experiences. It is the 'atypical' that also provides insight into the educational situation, especially if events are experienced differently in different contexts, or by a variety of participants.

While this may suggest a limitation in the ability to provide general conclusions, what it does offer is recognition of the diversity of experiences within and between school situations.

The small sample of schools involved in this evaluation, and the relatively low number of responses to the survey, further limit any generalisations that may be inferred from the evaluation. However, as stated previously, the opinions of those who did respond provide an insight into their experiences of the *QuickSmart* program.

1.5.4 Attribution

Finally, concurrent with the introduction of *QuickSmart* as the individualised program targeting those students in greatest need of support, each school was required to implement a whole-class numeracy program. In all cases where *QuickSmart* Numeracy was introduced as the individual-student intervention, *Taking Off With Numeracy* (TOWN) was implemented as the whole-class intervention.

A challenge exists in attributing effectiveness to any one program or intervention, and in isolating that effect from other influences in classrooms and schools.

1.6 Presentation of the evaluation findings

Section 2 provides an overview of the *QuickSmart* program, including its goals, major features and proposed model for teacher professional learning.

The evaluation findings are presented in Part 2 of this report, in the following sections:

Section 3. Implementation of *QuickSmart*

Section 4. Effects for students

Section 5. Teacher and tutor perspectives

Section 6. Impact in schools

Section 7. Summary of findings and conclusions.

The interview and observation schedules and the teacher and tutor survey results are included in two appendices.

2 QuickSmart program details

This section provides an overview of the *QuickSmart* approach and has been drawn from research literature (Bellert & Graham, 2006; Graham, Bellert, & Pegg, 2007), the *QuickSmart* Program website (SiMERR, nd), the National Partnership on Literacy and Numeracy information package for schools (NSW Government, 2009a) and the interview with Professor John Pegg and Dr Lorraine Graham conducted by the program evaluators (Dione-Rodgers, 2011).

2.1 Aim

QuickSmart is a basic skills intervention designed to assist students who demonstrate persistently low achievement. The program aims to improve students' ability to easily and quickly recall number facts and perform basic computation skills, referred to as 'automaticity'.

"Automaticity is inferred when such lower-order processes become fast, routine, and independent, and require only small amounts of cognitive resources." (SiMERR National Centre, n.d.a)

The aim of the *QuickSmart* numeracy program is to improve students' information retrieval times, reducing the focus on mundane or routine tasks. Students become better able to undertake higher-order mental processing and to develop age-appropriate mathematics skills.

2.2 Background

"The main aim of the QuickSmart research program is to investigate the effect of improved 'automaticity' of basic skills on higher-order processes such as problem solving" (Graham, Pegg, Bellert, & Thomas, 2004, p. i)

The development of *QuickSmart* interventions in literacy and numeracy began in 2001 by Professor John Pegg and Dr Lorraine Graham, from the University of New England's National Centre of Science, Information and Communication Technology and Mathematics Education for Rural and Regional Australia (SiMERR). It is a research-based program, currently being used in 450 schools nationally, and built around a professional learning program for principals, school leaders, teachers, teacher aides and school learning support officers.

The *QuickSmart* program was designed as a long-term, cost-effective program for middle school students performing in the lowest 30% of the achievement range, who need to improve their basic mathematics skills. The program targets those students who have been unable to draw benefit from other in-class and withdrawal instructional activities.

Working intensively with individual students, *QuickSmart* emphasises both strategy instruction and deliberate practice, to enhance students' automaticity. Professor Pegg claims that while intervention programs have been used for many years, none have achieved long-term impact.

QuickSmart focuses only on the number strand of the NSW mathematics syllabus. The development of automaticity makes skills transferable to other areas such as space and measurement.

According to the program developers, it is expected that students will attain an effective level of automaticity, on average, after a period of 30 weeks consistent involvement in the program. Variation in the length of engagement required, either shorter or longer, may be influenced by the existing knowledge of number facts and the ability of students. Professor Pegg noted that Aboriginal students may require longer engagement with the program, as automaticity *"is not the norm for them"* (Dione-Rodgers, 2011).

2.3 Features of QuickSmart

The *QuickSmart* program focuses on improving students' understanding and recall of basic number facts, performance of elementary calculations, and problem solving skills.

Both structured and incidental strategy instruction are important features of numeracy lessons, with the aim of moving students on from relying on slow and error-prone strategies (especially count-by-one strategies) to the use of more sophisticated and efficient strategies, including automatic recall.

Key features of the program include:

- pairs of students participate in 30-minute lessons, three times a week, for 30 weeks
- tutors use explicit strategy instruction, including modelling, focussed discussion, specific questioning sequences and guided and independent practice opportunities
- instruction focuses on the relationship between number facts and ways to recall them
- 'fact practice' games and activities that are integral to every lesson
- independent practice
- regular computer-based assessment tasks, used to provide immediate feedback to students and to
- track performance
- close collaboration with parents, teachers and principals.

Students learn *"it is ok to be wrong"*. Errors are used for correction and improvement. *QuickSmart* is about *"learning to trust my head"* (Dione-Rodgers, 2011).

The intention is to address individual student needs over an extended period, fostering learning in a non-competitive environment that focuses on individual improvement.

Assessment provides ongoing formative information to guide the design of each individual student's program. Most lessons conclude with the program's Cognitive Aptitude Assessment System (CAAS) assessment. The resultant graphs of performance are engaging and easy enough for the students to interpret.

There is an important relationship between tutor and students. Originally developed for one-to-one implementation, developers discovered that when students work in pairs there are additional benefits, including peer learning and sharing of experiences, as well as increased numbers of students able to take part, and reduced costs to schools.

2.4 Training and support

QuickSmart requires that teachers and tutors delivering the program participate in intensive training through the professional learning program. It is recommended that a school based team be established to manage implementation and that networks be formed between schools to provide further support for teachers.

2.4.1 Professional learning program

The SiMERR group provides all training, which occurs over three, two-day sessions for teachers and support staff. There is also a one-day workshop for principals.

All potential instructors, including tutors, class teachers, Student Learning Support Officers and other support personnel, may participate in the professional learning program. Training is focused on supporting *QuickSmart* instructors to understand and provide:

- learning scaffolds and motivational activities
- strategy instruction and concept development
- focused, fun, and successful practice that is integral to every lesson and involves guided and independent timed practice activities;
- appropriate teacher and peer modelling
- integrated assessment tasks in each lesson.

Teachers are encouraged to incorporate concepts of automaticity (Quick) and accuracy (Smart) regularly in their teaching.

2.4.2 Costs of training and materials

The costs of the professional learning program were presented as follows:

- between \$6000 and \$12,000 per school for the full professional learning program, depending on number of participants
- \$3000 per kit of materials (flashcards, timer, workbook, etc). A minimum of one kit is required per school.

Costs are dependent on factors such as the number of schools in a cluster, the implementation activities at each level of the model, and the type of commitment that different tiers of education are prepared to make to support the program (NSW Government, 2009a, p. 26).

The program providers suggest that training for non-teacher participants, such as School Learning Support Officers (SLSO) and Aboriginal Education Officers (AEO), is more cost effective as they are less expensive to replace for each training day.

SiMERR is a 'not for profit' organisation. All profits made are returned to the program to develop resources for schools.

2.4.3 School-based support

It is expected that each school will establish a *QuickSmart* team consisting of a teacher coordinator, *QuickSmart* instructors and a member of the school executive. The role of the team is to manage the organisation of the program and provide collegial support to both teachers and tutors.

School network

QuickSmart uses a model of implementation that sets up:

- groups within a school working at the student level, supported by the coordinator and team
- groups of schools within a cluster working to support teacher learning through a 'school network'
- clusters of schools within a region working at the policy level, while also ensuring the fidelity of implementation
- regions of schools within a state working to support and evaluate the program.

2.5 Resources

Many of the materials required to implement the program are provided in the *QuickSmart* Numeracy Resource Folder and the *QuickSmart* Numeracy Program User Guide, organisation folders and a range of teaching and learning resources.

2.5.1 *QuickSmart* Numeracy Resource Folder

The folder includes:

- focus fact sheets
- proformas for flashcard sets
- speed sheets
- strategy guidelines
- worksheets
- games
- graph sheets.

The folder also includes administrative and organisational information, teaching and learning resources, and a *QuickSmart* DVD. Master copies of all the forms, permission notes, planning notes, evaluation, assessment and graphing sheets required to implement the program are included. Electronic copies of all the documents are also included.

Teaching and learning resources have been developed in response to the individual learning needs of *QuickSmart* students since its inception in 2001. It is noted that these may need to be supplemented to meet the specific learning needs of particular students.

Electronic copies of the resources may be used to modify existing *QuickSmart* material or as templates for developing new resources, as required.

2.5.2 *QuickSmart* Numeracy User Guide

The *QuickSmart* Numeracy User Guide provides detailed guidelines for the planning and implementation of the program. These guidelines include:

- criteria for the selection of targeted and comparison students
- an overview of the *QuickSmart* instructional cycle
- suggested *QuickSmart* lesson formats and content
- explanations of assessment procedures used within the *QuickSmart* program
- a description of the instruments used to record students' progress within the *QuickSmart* program
- an outline of how the *QuickSmart* program itself is evaluated.

2.5.3 Monitoring student progress

The CAAS software is provided on a CD and is used for ongoing assessment throughout the duration of the *QuickSmart* program to monitor students' response times and accuracy.

The CAAS system measures how rapidly students complete tasks. The tutor scores each response for accuracy. Students' assessment results are automatically averaged per item and made available as either a graph or report form that is easily interpretable by both students and teachers. Most *QuickSmart* lessons conclude with an assessment on the CAAS system.

In order to gain a clearer indication of the effectiveness of the *QuickSmart* intervention for improving accuracy and automaticity of basic academic skills, pre- and post-test for students are provided. Results are submitted for each student. SiMERR collects CAAS and standardised test data from other students in the same grade, to be used as a comparison group to assess program effectiveness.

In general, the group of comparison students included in the assessments consists of average-achieving students as nominated by their teachers. These comparison students complete the selected CAAS sub-tests in numeracy at the beginning and the end of the intervention, and also participate in the standardised testing sessions (SiMERR National Centre, n.d.a).

2.6 Program support

For Departmental schools *QuickSmart* support was provided by regional consultants or *QuickSmart* trainers. The level and availability of support is determined by each region.

2.7 Previous evaluations

Based on program reviews by the developers, Professor John Pegg and Dr Lorraine Graham, it is claimed that after three years of using *QuickSmart*, schools report whole-school growth regardless of which students have been on the program.

The developers purport to have evidence demonstrating that students, both Aboriginal and non-Aboriginal, have made academic improvement over the course of involvement in the *QuickSmart* Program.

Examples of research evidence (SIMERR National Centre, n.d.b) indicate that:

- In the Northern Territory during 2006, 2007 and 2008 the effect size growth of many hundreds of *QuickSmart* students based on statewide tests was 0.68, 0.60, 0.78, respectively, and compared to a considerably lower effect size of approximately 0.3 or less calculated for the average-performing comparison cohort. Data collected over three years indicates that schools can expect on average a 10% improvement on standardised test results of *QuickSmart* students in the first year of implementation and that jumps to approximately 20% improvement in the second and subsequent years of implementation.
- At Orara High School, 44 Year 7 students undertook the *QuickSmart* program in 2006 and presented for the 2008 National NAPLAN test in Year 9. The results show that 42 students were above benchmark. The two students below benchmark were identified as IM² students in Year 7; however each student experienced above average growth for the period.
- Results from eight schools who participated in *QuickSmart* in the North Coast Region of NSW in 2007 had an effect size 0.75 on the Progressive Achievement Tests in Mathematics (PATMaths) Third Edition (ACER, 2005). The comparison cohort's effect size was 0.19. The test cohort's results represented in excess of an threefold growth over the year. This result improved in 2008 with an effect size of 0.801 for the new *QuickSmart* cohort of 238 low-achieving students, of whom 52 were Aboriginal.
- An analysis by independent statistician, using the large data sets of several hundred students in NSW over several years whose performance on *QuickSmart* has been evaluated using the Progressive Achievement Tests in Mathematics (PATMaths) Third Edition (ACER, 2005) found that the effect size for *QuickSmart* students ranged from 0.59 to 0.69, with the latter figure representing those students who completed the full 30 weeks of instruction.

2 IM classes are provided for students with a mild intellectual disability.

Part 2 Evaluation findings

Part 2 presents the findings of the program evaluation, organised in terms of priority areas identified in the Terms of Reference for the evaluation, and in response to issues that emerged through the data collection.

3 Implementation of *QuickSmart*

Section 2 provided an overview of the *QuickSmart* program as it is intended to be implemented.

This section sets out the major implementation influences that made a difference to schools' experiences of *QuickSmart* in practice.

Key findings:

- Ease of implementation, resources and assessment software were instrumental in schools' decisions to implement *QuickSmart* as their individual-student intervention.
- Decisions about which children may take part in *QuickSmart* need to consider a range of criteria in addition to NAPLAN or other assessment results.
- The costs of training placed limits on the number of teachers and other staff who could take part in the *QuickSmart* professional learning program.
- The role of the coordinator was essential in establishing and managing the withdrawal program.
- The professional learning model was effective in increasing teacher and school capacity to implement *QuickSmart* strategies beyond the individual-student intervention.

3.1 Program choice

For schools choosing numeracy as their target area for improvement, the choice of programs was limited. Schools had only one choice of whole-class numeracy program: *Taking Off With Numeracy (TOWN)*. *TOWN* could also be used as the targeted intervention for individual students. The only other program on offer was *QuickSmart*. One principal expressed his displeasure at the lack of choice:

"[That] there weren't many intervention options available to us to choose from in the first place was one part of it. So that's like a gun to the head. We just had to choose what was there."

The additional frustration expressed by principals was the short time frame in which they had to make a professional decision regarding program choice. One expressed it bluntly:

"The biggest difficulty in choosing any of them was the ridiculously short timeframe to make judgements of expenditure of hundreds of thousands of dollars without access to asking people questions about how things actually work."

Two of the visited schools had been using *QuickSmart* for a period prior to the commencement of the National Partnership on Literacy and Numeracy (NPLN). The additional funding allowed them to expand the program, beyond the bare minimum. One principal explained:

"We'd already been involved in QuickSmart for two years. We were a pilot school from 2009 and in that time we had seen... the confidence of the kids was building. So we thought it was something to have a go at and sort of explore a bit more."

The other two principals indicated that they were more impressed with *QuickSmart* than *TOWN*, so made the decision to go with the alternative program for their individual numeracy intervention. At one school they used *TOWN* and *QuickSmart* “as a package... that creates an impact.” A number of teachers indicated that the ease of program implementation, the provision of the resource kit and online assessments, also contributed to the decision to implement *QuickSmart* within their schools.

For several principals, knowledge of the program had come through existing association with the University of New England (UNE). Proximity to UNE and SiMERR was a strong motivator in program selection for schools in the New England area. One principal explained:

“QuickSmart originates from UNE. We knew about [QuickSmart] through our prac students. We have a bit of a relationship with UNE anyway, so we thought that might be helpful seeing as the originating organisation isn’t too far away.”

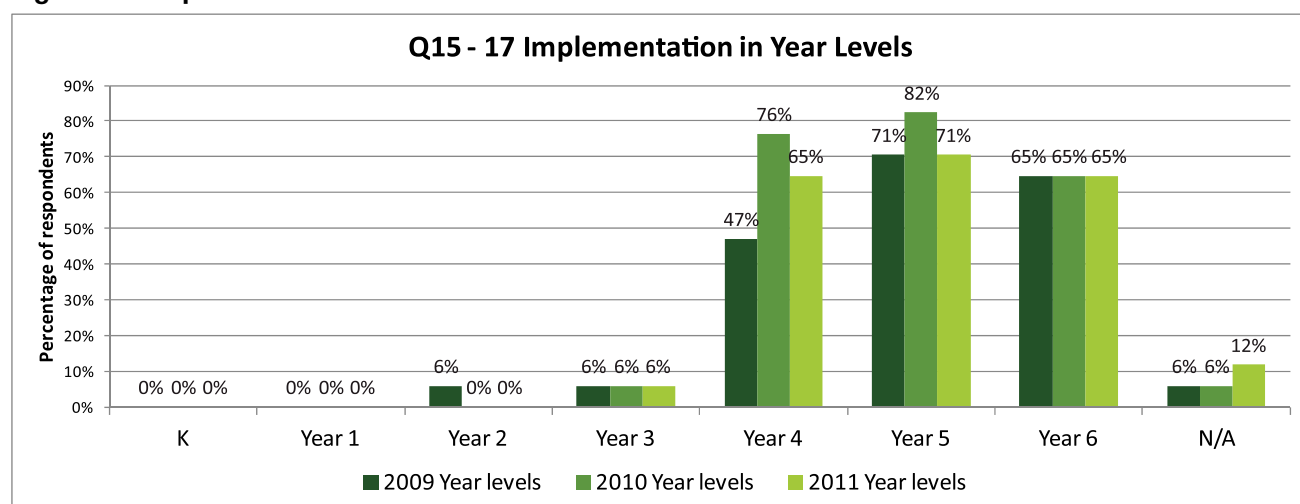
3.2 Selection of students

QuickSmart is program designed primarily for middle years’ students. In order to meet the criteria for participation, primary school students must:

- demonstrate persistent difficulties in numeracy
- display a good attitude to working in small groups
- not have intellectual disabilities (NSW Government, 2009a).

In line with *QuickSmart* program recommendations, students were mainly selected from the Years 4 to 6 bracket. Survey results indicate that nearly all students targeted were in Stage 3 during the NPLN period, as shown in Figure 3.1.

Figure 3.1: Implementation in Year Levels 2009-2011



One school identified that they had an informal ‘waiting list’ while most of the others identified the need to carefully select those in greatest need of assistance, as expressed by one principal:

“... were only able, as a result of the funding, to facilitate [participation of] the most needy students - not all who needed it. So we had to prioritise.”

Most schools reported selecting students based on their NAPLAN performance; those with results in Bands 1 or 2. This was sometimes tempered by discussions with teachers, as to who might benefit most from participating.

Teachers had varied views of who such children might be. Some agreed that the lowest-performing students were most entitled to be involved. The following issues were raised in teacher and principal interviews:

- Some students were identified by teachers to be 'not ready' for the intensity of the program, especially those in Year 4. Other teachers regretted the NPLN criteria of 'persistent difficulties', as expressed here:

"... the rigid structure of targeting kids when they had already failed was an initial problem - we wanted to try and catch them earlier."

- Year 6 students were sometimes seen as most needy, particularly to better equip them for high school.
- Some schools saw value in involving Year 4 so that benefits would be apparent in future NAPLAN results, although a few teachers expressed reservations about this rationale.
- Others suggested that the nature of individual students should also be taken into consideration.

The most common area of debate related to whether students *"other than the lowest [performing]"* would benefit more from participation. As *QuickSmart* sessions were often reported to be conducted during maths or numeracy time, teachers debated whether the time spent with the *QuickSmart* tutor was sufficiently beneficial to offset the disadvantage of missing further maths learning opportunities occurring in class, particularly for those students performing least well. As one teacher suggested:

"... and as I said, the kids if they're low and they're getting one-on-one and that's super but if they're missing that half hour [of class work] and then they miss the next half hour because they're late for it, that's a whole sort of hour of class time missed so..."

Q. So the benefit isn't great enough? It depends on the kids. I'd say the kids I have this year - no. The kids I had last year, most of them - yes."

The need to consider students' ability to rejoin class activities was raised at each of the schools visited. As suggested in one teacher discussion:

"... sort of kid that needs motivation to work, the last thing they need is to come halfway through a lesson ... So you probably need to look at how the kids can work independently; how good they are at coming in and getting into their work; as much as their needs."

Teachers also suggested that the *"middle, just below where they should be, kids"* may make greater gains from the program, as well as being more able to *"walk [back] in, look at what everyone else is doing and pick it up."* Some teachers expressed strong views, such as:

"I believe the QuickSmart program to be of the greatest benefit to students who fall in the middle band for numeracy. I feel they have the ability to transfer knowledge from their time with the QuickSmart tutor into the classroom."

Other comments from teachers suggested that the program, while quite structured in how it operates for students, was flexible enough to allow it to fit in with how the school decides to proceed.

Interesting comments came from a number of parents, all of whom suggested that their children would benefit from *QuickSmart* being introduced earlier than Year 5:

"... and getting them in earlier grades, not just the 4/5 mark. I know my child would have benefited had he been doing it for all of Year 4 rather than most of Year 5. I know numbers are an issue and tutors and money but... it's a brilliant program."

"Only - keep it going and implement it sooner. It works!"

3.3 Staffing

Finding suitable tutors was reported as being the critical influence on the success of the program.

Some schools chose to re-direct existing school support staff to act as *QuickSmart* tutors, including library assistants, Support Teacher Learning Assistance (STLA), SLSOs, and AEOs, and the school community was eager to participate. As required, extra tutors were hired to cater for the numbers of students involved in the program. All principals emphasised the importance of getting the right people:

“I think one of the things we concentrated on was finding the right people [tutors] to deliver the program - and keeping them.

“...they all are parents at the school, and have been here for a long time, in volunteer work as well as other aiding work, Special Ed as well as other things... We didn't advertise the positions, we hand-picked who we thought could do the job well.”

Principals indicated that staff choice was relatively easy as there was support from existing staff. One principal noted that the willingness of staff made implementing the program less complicated:

“The fact that I've had staff willing and keen to do it. We all hear stories where staff say I'm not going to do it and you can't make me almost. I've been lucky that the four ladies, the two initially and now another two that we've trained up are very keen to run it. They find it reasonably easy.”

Most schools had a small team of tutors, often three or four to meet the demand. The stability of the tutoring team was highlighted as a significant benefit in most of the schools involved, attributed to the relationship developed between the tutor and the school, especially the *QuickSmart* coordinator. Support for the tutors was important: from the coordinator, teachers and within the group of tutors themselves. Tutors working collaboratively was seen to benefit the school as well as the tutors:

“... to maintain that team of tutors - they bounce ideas off each other - they're supporting each other so there's a close knit little team there as well.”

3.4 Professional learning

As mentioned in Section 2.4.2 the *QuickSmart* program provides professional learning opportunities to teachers and support staff, numeracy coordinators and educational leaders.

The program providers expected the establishment of a school-based support team, and also recommended the establishment of networks at the local cluster, regional and statewide levels.

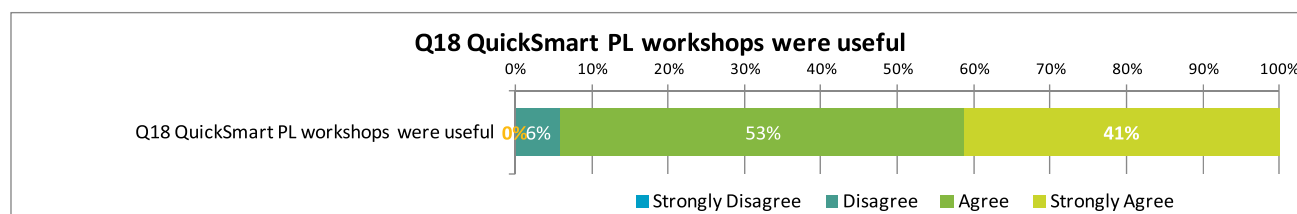
Within the NPLN implementation, only the school level and, in some cases, the school network level operated effectively.

3.4.1 *QuickSmart* professional learning program

The first professional learning opportunity provided as part of the *QuickSmart* program implementation is a day for principals and other administrators to engage with the details of the program, examine the results of the research that establishes the intervention's effectiveness, and, where possible, visit a *QuickSmart* site.

Principals indicated that this was valuable in determining the choice of program for their school, as well as giving them the necessary professional learning to effectively support their staff throughout the program implementation.

The *QuickSmart* coordinator and instructors then participated in the series of two-day professional learning workshops. Nearly all staff considered the professional learning associated with *QuickSmart* to be useful, as indicated in Figure 3.2.

Figure 3.2: Usefulness of professional learning

Organising attendance at the training days presented logistical as well as funding issues. Most teachers had to travel significant distances for each two-day workshop, either to Sydney or Armidale. In addition to the cost of the training, schools had to fund travel and accommodation expenses, and relief for teachers or others attending. Additional days of relief to cover travel time meant that each two-day workshop cost the school up to four days' relief, as explained by a teacher:

“The location of training has been a problem for us. We had to go to Sydney which is 4 days really – a day of travel, two days’ of being trained and a day of travel back. That was certainly a hindrance.”

Even schools located in the New England region, closer to Armidale, described attending training as onerous. For one school where costs for travelling were prohibitive, the UNE team provided one of the three *QuickSmart* training sessions at the school.

While one survey respondent reported that all staff in their school had taken part in training, for many others the costs put severe limits on the number of people who could be involved. School-based training was seen as a lesser but necessary option. Training of tutors was provided in-house to save money, as reported by one coordinator:

“... we ran it with a couple of aides, so we had a couple of aides trained and when I say trained, I did the training - they didn’t go off to the training... because we’re right at the southern end [of the region].”

The decision to train teachers and tutors together was seen as beneficial by a few schools. The opportunity to clarify processes and plan for implementation in the school while away together at the training was appreciated, as one tutor noted:

“...it’s partly what the training days did, we were all together and [teachers] were at those training days... gave opportunities to talk about things; very structured but it gave us some opportunity to [plan together]”

Principals noted that they would like to have all their teachers trained in *QuickSmart* so that effective strategies can be included within class practices for all students.

3.4.2 Ongoing support

Each school established the *QuickSmart* team as required. The *QuickSmart* (teacher) coordinator was expected to lead the implementation of the program, and with support from the school executive, organise the timetables, training and liaison with parents and community, as required. For some Departmental schools, support was available from a regional *QuickSmart* or NPLN facilitator.

The school network

Only a few schools reported being part of one of the *QuickSmart* school networks. In one school where *QuickSmart* was in operation prior to the NPLN, they maintained their links with the existing network, meeting two or three times a year. Sharing ideas, particularly around common problems was seen to be valuable in also keeping support costs down.

The geographic location of the school seemed to be the other factor influencing the support provided for implementation of the program. Schools located close to the University of New England (UNE) reported receiving effective support. Schools that were more geographically isolated found the 'school network' support feature a challenge. As one coordinator explained:

"I also got an email from [coordinator] at Crawford. He asked if we wanted to be part of a network and I said 'Yes', but I've never heard anything back from that... He initially said they would catch up, have meetings and see how things were going. That was in Term 1 but I've never heard anything since so..."

Overall, school leaders indicated that sufficient support was available from the initial professional learning activities, from school-based *QuickSmart* coordinators and through the regional program facilitators.

3.5 Space and timetabling

A few principals commented on the need for extensive planning in order to locate appropriate spaces for *QuickSmart* to function effectively, and to enable scheduling of students to attend three half-hour sessions per week. As noted by one assistant principal:

"Withdrawal programs are always a challenge when it comes to timetabling, coordination of staff and combining appropriate pairs of students. It is always a concern when time is short."

3.5.1 Locating suitable work spaces

The work space required for *QuickSmart* had to accommodate a tutor and two students working intensively for half an hour without interruption, with access to networked computer software and online assessment activities. In some cases, up to three tutors may be working with students at any given time. A few school leaders indicated that it was vital to have a designated space so that the resource kits could be easily accessible.

In some schools NPLN funds were used to redesign rooms to ensure an appropriate environment was available for learning. One principal advised:

"We didn't have enough [space] because we had two tutors operating - that was the decision we made - so we needed to redesign a room and have some building works done over the Christmas holidays, in readiness."

For others the computing infrastructure was the issue:

"...it comes down to the availability of the resource (computers) on a network that is reliable."

"...the QS program needs PC computers, and we're a Mac school. ...so it has probably cost us a bit more than other schools because we have had to purchase computers that we wouldn't normally have purchased..."

3.5.2 Timetabling

Once spaces had been established, school leaders highlighted the challenges in timetabling all students to fit in with class demands and tutor availability. It was complicated to balance individual student's time away from classes with the number of sessions each tutor could do in a day or week.

Coordinators spent considerable time trying to avoid situations where students consistently missed the same lessons, especially "*literacy time*". Several coordinators expressed frustrations such as:

"We've tried to consider things like reading groups, and not taking kids out at that time and adjusting different times throughout the week."

They reported creating timetables where:

“... we do a different time for each day of the week that they have QuickSmart, so that they don't miss the same thing every day. So they might have a 9:00 to 9:20 on one day and 11:20 to 11:50 on another day, so they don't miss maths every day, or they don't miss reading groups every day.”

The down-side of this system was that students and teachers struggled to keep track of where they should be, as one teacher admitted:

“I'm constantly forgetting who's going when, which is a real pain for the tutors. They're chasing me up. So where's W? I forgot it was 10.00 o'clock.”

Other schools tried systems that allocated sessions to coincide with sport or assembly times, or where students from one class would all go to tutoring at the same time. One coordinator explained their solution:

“From that experimentation we found that we needed to at least each term change the timetable so that the kids were coming out of classrooms at different times.”

Being flexible was important for all participants: teachers, tutors and students. As described by teachers:

“The tutors are pretty good at readjusting the timetable if there is a particular assessment going on in the classroom and the teachers say, do you mind? They'll probably reorganise things.”

“Some students who know they've got something on and will talk to the QuickSmart tutors in terms of reorganising their schedule.”

3.6 Costs of implementing QuickSmart

In addition to the cost of employing tutors, the two major expenses encountered by all schools were the cost of the professional learning program and the mandatory kit of resources.

The estimated cost of initial professional learning for each school was between \$6,000 and \$12,000 depending on the number of teachers or other staff participating, and the input provided at the cluster and region levels. Added to this was the cost of teacher relief, travel and accommodation for all those attending the training.

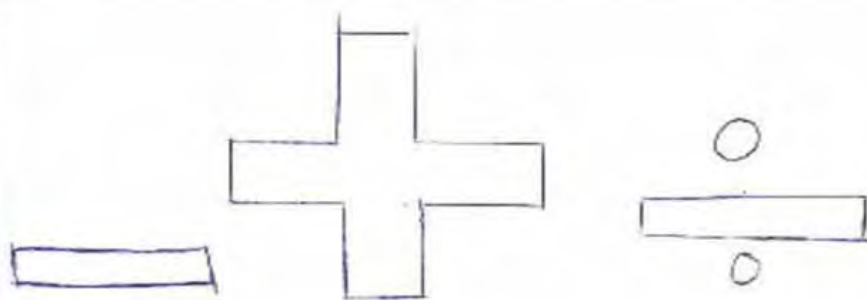
Each school needed to purchase the kit of materials valued at \$3,000. Some schools chose to purchase more than one kit, especially where QuickSmart strategies were implemented across classes, as well as in the withdrawal mode.

As mentioned in Section 3.5.1, some schools were faced with additional expenses in order to implement QuickSmart effectively, including:

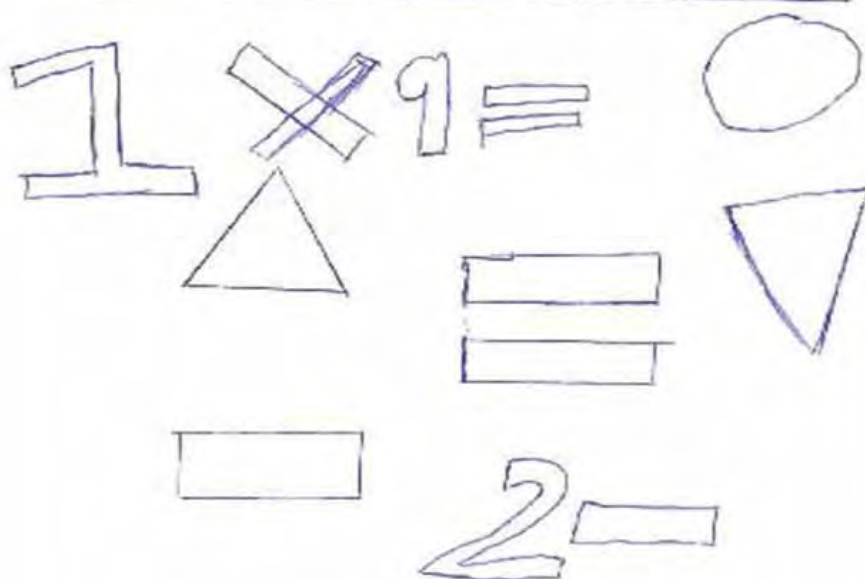
- building alterations to accommodate the physical and technical requirements of the program, and
- new computers, again to meet the technical specifications of delivering the program.

In both cases the improvements were only able to be undertaken with the assistance of NPLN funding, as reported by one of the principals:

“There's no way we could have done the [building] work we've done for QuickSmart if we didn't have that money.”



Fun With ⁴⁻¹⁰ Maths



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4 Effects for students

In determining the effectiveness of *QuickSmart*, the effects on students figure most prominently, both in terms of learning achievement and associated attitudes to numeracy.

In assessing achievement of syllabus outcomes, teachers use a range of strategies to gather information about the performance of students. The National Assessment Program - Literacy and Numeracy (NAPLAN) and other external measures form just one part of overall student assessment.

Findings in this section are drawn from analysis of the NAPLAN and National Partnership on Literacy and Numeracy (NPLN) assessments, responses to the teacher survey and importantly, from information reported through interviews with students, parents and teachers.

Key findings:

- Improvements in numeracy outcomes for students involved in the *QuickSmart* program are evident from data obtained from the teacher survey and school visits.
- Improvement in numeracy outcomes for students in schools implementing *QuickSmart* is evident in NAPLAN and NPLN results.
- Improvement in numeracy outcomes for Aboriginal students is at least comparable to, and in some cases, greater than for non-Aboriginal students.
- School staff and parents reported increased student confidence and improved self-esteem as a result of engagement with *QuickSmart*, resulting in improved numeracy and other academic and social outcomes.
- Students reported enjoyment of *QuickSmart* and identified numeracy improvements, through the online Cognitive Aptitude Assessment System (CAAS) assessment scores. They were proud of being better able to do things that are important to them.

Evidence from all data sources, indicates that student learning outcomes in numeracy have improved. This is more strongly supported by teachers', parents' and students' impressions of effective learning than by broadscale testing measures.

4.1 External performance measures

To fulfil NPLN expectations, schools were required to regularly administer and analyse the NPLN assessments, in addition to the annual NAPLAN tests.

In both data sets, NAPLAN and NPLN assessments, gains in mean numeracy scores were observed for all student cohorts at schools implementing *QuickSmart*.

The following data is presented in the interests of completeness of the evaluation. In schools implementing *QuickSmart* as their individual-student intervention, the majority of students taking part in the program were in Year 5 or Year 6 (as demonstrated in Figure 3.1, shown earlier). Accordingly, the influence of *QuickSmart* on student performance is highly unlikely to be evident in these results.

4.1.1 National Assessment Program - Literacy and Numeracy (NAPLAN)

The NAPLAN data for numeracy is presented in the four tables below for Year 3 2008 and 2009 and Year 5 2010 and 2011. The results in Table 4.1 are for the 2008 Year 3 cohort in the schools implementing *QuickSmart* Numeracy.

Table 4.1: NAPLAN Numeracy, 2008 Year 3 QuickSmart (QS) cohort

2008 Y3 QS Cohort	Cohort No.	Cohort %	QS Mean	State mean	QS effect size
All Students	736	100%	373.1	409.5	-0.47
Boys	344	47%	372.1	413.6	-0.51
Girls	392	53%	374.0	405.3	-0.43
Aboriginal	85	12%	334.2	351.6	-0.25
Non-Aboriginal	636	88%	378.7	411.9	-0.43
LBOTE	40	6%	375.2	415.7	-0.50
Non-LBOTE	610	94%	373.5	407.8	-0.46

In 2008, the effect size of -0.47 when compared to the state mean for the 'All students' cohort shows a general performance below state, with the *QuickSmart* mean about half a standard deviation below the whole-state mean.

Aboriginal students have the best cohort performance compared to the state Aboriginal student cohort, at -0.25, which is nevertheless below the state performance. This difference in results for Aboriginal students was present in all the year groups, as seen in the three tables below (Tables 4.2, 4.3 and 4.4). The proportion of Aboriginal students in the *QuickSmart* program schools, at 12% to 14%, was three times that of Aboriginal students in the state as a whole, at 4%.

Table 4.2: NAPLAN Numeracy, 2009 Year 3 QuickSmart (QS) cohort

2009 Y3 QS Cohort	Cohort No.	Cohort %	QS Mean	State mean	QS effect size
All Students	704	100%	366.9	405.9	-0.48
Boys	342	49%	368.7	409.5	-0.47
Girls	362	51%	365.3	402.1	-0.48
Aboriginal	87	12%	341.6	345.3	-0.05
Non-Aboriginal	616	88%	370.3	408.2	-0.47
LBOTE	44	6%	356.1	410.2	-0.62
Non-LBOTE	660	94%	367.7	403.2	-0.45

Results for the 2009 Year 3 cohorts were similar to those of the 2008 cohort with the exception that the performance of the Aboriginal students in numeracy was markedly higher, being almost equal to the performance of Aboriginal students in the whole of the state.

Table 4.3: NAPLAN Numeracy, 2010 Year 5 QuickSmart (QS) cohort

2010 Y5 QS Cohort	Cohort No.	Cohort %	QS Mean	State mean	QS effect size
All Students	743	100%	460.0	499.5	-0.50
Boys	357	48%	463.2	505.3	-0.50
Girls	386	52%	457.1	493.5	-0.48
Aboriginal	86	12%	425.6	437.4	-0.18
Non-Aboriginal	655	88%	464.6	501.9	-0.47
LBOTE	52	7%	466.4	512.4	-0.51
Non-LBOTE	691	93%	459.5	493.7	-0.46

The results for the 2010 Year 5 cohort show an improvement since Year 3 in numeracy performance for all cohorts. The effect sizes are very similar to those for 2008 for all the cohorts and show that the *QuickSmart* schools improved their performances by about the same amount as the whole of the state.

Table 4.4: NAPLAN Numeracy, 2011 Year 5 QuickSmart (QS) cohort

2011 Y5 QS Cohort	Cohort No.	Cohort %	QS Mean	State mean	QS effect size
All Students	681	100%	457.3	500.6	-0.55
Boys	324	48%	457.1	506.5	-0.59
Girls	357	52%	457.4	494.4	-0.50
Aboriginal	94	14%	432.3	440.9	-0.14
Non-Aboriginal	583	86%	461.3	503.0	-0.53
LBOTE	31	5%	459.8	514.9	-0.61
Non-LBOTE	648	95%	457.1	494.3	-0.51

The results for the 2011 Year 5 cohort show an improvement since Year 3 in numeracy performance for all cohorts. The effect sizes are more positive than their Year 3 effect sizes for all cohorts, indicating a greater improvement than for the whole of the state, with the exception that Aboriginal students in those schools improved their performance by about the same as the whole of the state in 2011.

Comparison to National Minimum Standards

The comparison of mean percentages of students who performed below, at or above National Minimum Standards (NMS) in numeracy is shown in Table 4.5. The cohorts listed are students in *QuickSmart* schools, the NPLN program schools as a group and the state as a whole, for the 2010 and 2011 Y5 cohorts. The numbers are the change in percentages at each level, between Year 3 and Year 5 NAPLAN.

Table 4.5: NAPLAN numeracy for QuickSmart (QS), comparison to National Minimum Standards

Comparison to National Minimum Standard (NMS)						
	Change in % below NMS		Change in % at NMS		Change in % above NMS	
Year cohort:	2008-2010	2009-2011	2008-2010	2009-2011	2008-2010	2009-2011
QS schools	2.2	-1.4	7.1	4.2	-9.4	-2.9
NPLN schools	0.1	-2.1	7.3	1.5	-7.4	0.5
State	1.1	-1.0	4.5	-1.1	-5.5	2.1

The percentages below NMS are similar in Year 5 for all three cohorts in 2010, but the percentage above NMS fell markedly so the increase in percentage at NMS came mainly from that downward shift. In the 2011 cohorts the changes were smaller and there was little overall difference in performance by this measure.

However the somewhat arbitrary nature of the way NMS is defined as performance at Band 2 in the NAPLAN test, limits the utility of the comparison due, amongst other factors, to the small proportion of students who achieve in Bands 1 and 2 of the NAPLAN test. No firm evidence can be drawn from this data, about the effectiveness of the QuickSmart program.

Trends between Year 3 and Year 5

The QuickSmart gain scores and differences in effect size (ES), between Year 3 and Year 5, aggregated over all schools participating in the QuickSmart program under NPLN, are listed in Table 4.6.

Table 4.6: QuickSmart NAPLAN gain scores and differences in effect size (ES) from Year 3 to Year 5

QuickSmart	Gain Score		Difference in ES	
	2008-2010	2009-2011	2008-2010	2009-2011
All Students	86.9	90.3	-0.02	-0.07
Boys	91.1	88.5	0.01	-0.12
Girls	83.1	92.1	-0.05	-0.02
Aboriginal	91.4	90.7	0.07	-0.09
Non-Aboriginal	85.9	91.0	-0.04	-0.06
LBOTE	91.2	103.7	-0.01	0.02
Non-LBOTE	86.0	89.5	-0.01	-0.07

The gain scores between Year 3 and Year 5 indicate higher performance in numeracy in Year 5 for both cohorts. The gain scores for LBOTE students in the 2009-2011 cohort were a little higher than for the other groups.

The effect size measure, which is the more standardised measure, shows a similar performance to the statewide change in numeracy performance for both the 2008-2010 cohort and the 2009-2011 cohort. However, the comparability of the measures when many students are at the low end of the test score scale is problematic and the evidence is qualified in many other respects to do with program implementation at the student level.

Further data gathering in subsequent years, including attention to measures of program implementation, related to NAPLAN scores at the student level, would provide stronger evidence for effectiveness.

4.1.2 National Partnership on Literacy and Numeracy assessments

In NPLN assessments, gains in mean numeracy scores were observed for all student cohorts at *QuickSmart* schools. NPLN assessment data also indicates that the gain scores for Aboriginal students were higher than those for non-Aboriginal students.

The NPLN baseline assessment is developed from the Basic Skills Test, and was first administered at the beginning of the *QuickSmart* implementation (pre-test in 2009 for Years 2, 3 and 4). It was administered again in August 2010 (midway test for Years 3, 4 and 5), and a final test was administered in August 2011 (post-test for Years 4, 5 and 6).

As detailed in Section 1.5.3, Educational Measurement and School Accountability Directorate (EMSAD) has noted a number of limitations in using this data for evaluation of the literacy and numeracy programs. In particular the NPLN tests are adequate for whole-cohort assessment but are too brief to use for diagnostic assessment of individual students.

For both NAPLAN and NPLN assessments, comparisons across different groupings of schools, (i.e. *QuickSmart* schools, NPLN numeracy focus schools, all state schools) should be interpreted with caution due to limitations in attribution and consistency. For NPLN schools implementing a particular numeracy intervention, the numeracy outcomes will be influenced by how well different schools implement the program, and whether the school has concurrently implemented other programs targeting numeracy.

Likewise, whilst comparison with the state as a whole (for NAPLAN data) provides a reference point for interpretation of NPLN program results, the state is not a valid control group due to the broad range of numeracy programs used in schools across the state, including in some cases the same programs as those funded through the NPLN.

Given these limitations, EMSAD has advised that considerable caution should be taken in the interpretation of these data sets.

4.2 Local assessments by staff, students and parent community

A range of strategies was used by teachers to gather information about the performance of students, including:

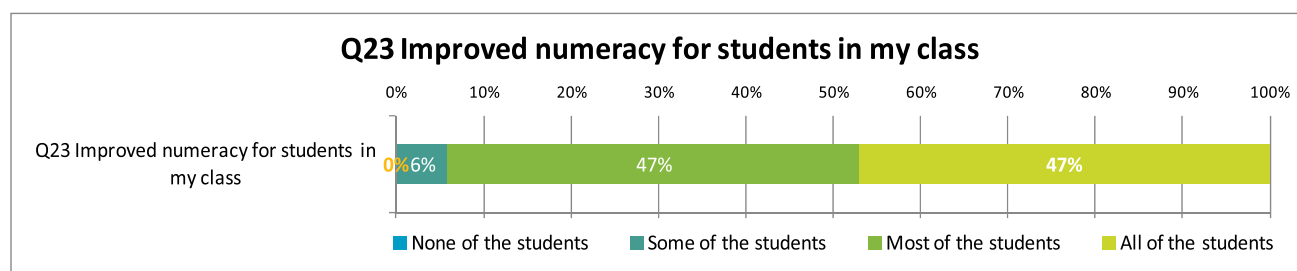
- school- and class-developed assessments
- program-specific strategies such as *QuickSmart*'s online CAAS assessment
- teacher observations and students' self-assessments.

Across the range of schools visited as part of the evaluation, staff, students and parents were positive in their appraisal of *QuickSmart* in producing improved numeracy outcomes for students.

4.2.1 Numeracy outcomes for students

Almost all respondents to the online survey said *QuickSmart* has improved numeracy outcomes for most or all students engaged in the program, as shown in Figure 4.1. No one said that 'none of the students' had improved.

Figure 4.1: Improved numeracy outcomes



School staff views

Teachers, tutors and principals were almost unanimous in their identification of improved student learning as a result of participating in *QuickSmart*. A number of measures were quoted as providing evidence, across the range of respondents, as follows:

- Results achieved through the Cognitive Aptitude Assessment System (CAAS). Student progress in *QuickSmart* is monitored using this software program, with the support of SiMERR. One principal stated that:

“The children involved in the QuickSmart on the CAAS assessment do better than a comparison group.”

- Analysis of general school-based assessments showed definite improvements for students involved in *QuickSmart*, beyond the level achieved for the rest of the student group.

“The students who were at the bottom of my class are now certainly, now heading towards the top because they have the strategies to be able to apply to problem solving and things like that.”

“The control group continued to achieve, but the achievement was outstanding for the kids in the [QuickSmart] part of the program.”

- Most teachers indicated that NAPLAN data had shown improvements for their students on the program, as described at one school:

“Our NAPLAN results seem to have taken a turn for the better; so I guess if you purely measure it that way, it’s working.”

The success of *QuickSmart* was largely attributed to features such as:

- individualised nature of the program
- accurate targeting of skills to be developed, based on regular monitoring
- a logical progression of skill attainment
- instant, visual feedback to students
- game-based repetition
- the provision of intensive, one-on-one support.

Frequent comments particularly from principals, are well summed up by one principal who described the value of the program:

“You have two kids with one tutor. They have a placement test which tells you exactly where to start with each individual child and then the program runs almost on an individual basis from then on. So in that regard it is almost impossible for it not to be successful.”

Some dissenting views about the appropriateness of the program for some selected students were reported in at least two schools. Teachers expressed doubts about the readiness of Year 4 students to get real benefit from the program. This issue was highlighted by several teachers:

“The improvement in students is strongly related to their readiness for the program, especially when Yr 4 students are involved.”

“... increased confidence? This year with Year 4 I haven’t seen that as much at all. It might be the kids that selected it. I don’t know – a different batch or it might just be that standard or something.”

“I’ve found this year with Year 4; I’ve seen less effectiveness at all and in fact some kids probably [make] little if any gain or benefit from it all.”

Student views

Nearly all interviewed students reported that they had improved in numeracy. The most frequently mentioned changes were in:

- knowledge and recall of times tables
- computational skills such as addition, multiplication and division
- use of strategies and short cuts.

A number of students identified a general sense that mathematical work was easier, both in class and for homework. Students commented on dramatic improvements in test scores, or on specific areas of improvement, such as:

“I’ve done tests and it’s improved my grades. Before I started QuickSmart I’d probably get 8 /20 like and now I’m getting 16s and 17s.”

“... it’s good fun and my division and multiplication are really good now.”

Another student explained that he did not feel pressured during *QuickSmart* lessons:

“I reckon QuickSmart has helped me in maths because you don’t feel as much pressure, and out of a thousand, I think I’d give it 900.”

One student was keen to explain his support for the program, as follows:

“... it’s helped me a lot and now when I grow up, I might be able to get a better job.”

A small number of students were not so enthusiastic, reporting they had not made much improvement, because:

“Maths is not really my thing and in my class I’m not really that good.”

“I don’t think it’s helped me much with [maths] ‘cause I still don’t get it”

Parent views

Many parents commented that their children were showing improvements, especially as demonstrated in the homework being brought home. Most frequently they noted improvements in knowledge of times tables and use of the strategies learnt through *QuickSmart*.

One parent advised that her child was also being tutored outside school hours, so she was not sure if it was the private tuition or *QuickSmart* which had made the difference. Another parent was sure that *QuickSmart* was the only reason for her child’s progress:

“[My daughter] only does QuickSmart so the improvement has only come from there. I’ve been doing random times tables sheets at home and getting her to do them and I’ve been doing that for a couple of years so the penny hadn’t dropped. But, it has now... She does have the foundations, and once it’s explained to her she can do it and actually get the right answer instead of a page of red crosses. Yes, definitely an improvement.”

A number of parents commented on the creative ways the program uses game-like strategies and the importance of the children being treated in age-appropriate ways, as described in one parent interview:

“It went back to basics but [my daughter] didn’t feel as if she was being treated as a little person because the challenges were being presented in a different way.”

“It took them to basics which I think the kids needed, without being treated as like a five or six year old.”

Another parent suggested:

“I think they’ve made it like it’s creative and it makes it interesting for children who are naturally probably not academic... If it’s creative it keeps them inspired to want to learn with it. So I think it’s a great program.”

One parent had observed QuickSmart in action and commented on the use of repetition in achieving outcomes:

“I sat in on a couple of lessons. The repetition was great in reinforcing the learning, but the repetition was done using a variety of methods so the kids didn’t actually realise that there was a huge amount of repetition. It was certainly one of the best programs I’ve seen in the school.”

Transferring skills

The test of an individually-targeted intervention must be the ability of students to use what they learn in new and different situations.

Students were generally confident that they were able to apply the strategies and the knowledge gained through QuickSmart. They talked of a variety of practical examples as evidence of transfer of their numeracy knowledge, especially to aspects of mathematics and science lessons; being better at measuring, dividing, telling the time, working faster, and timing experiments. One student recounted the change he felt:

“Well I used to really not like science because I couldn’t get it properly and then I went to QuickSmart and now I know how to measure in millimetres and stuff, and I can do the experiments now without feeling bad.”

Students also noted many other activities they now felt more capable in, including playing games at school, doing homework, adding up the golf score card, playing cricket and even playing Monopoly at home:

“When we play Monopoly at home it helps. You have to roll the dice and add them up. It’s a lot faster.”

There was mixed evidence from teachers. Some quite enthusiastically affirmed that students were:

“... transferring knowledge and confidence into classroom.”

“Students involved in the program not only improve their instant recall of number facts but also become more confident in transferring skills to other work.”

Other teachers were not as certain, expressing concern that:

“Some students become good at QuickSmart but they don’t transfer their knowledge.”

“... it’s the part that kids don’t like - the problem solving and that’s the application of what they’ve learnt and sometimes kids just don’t get it.”

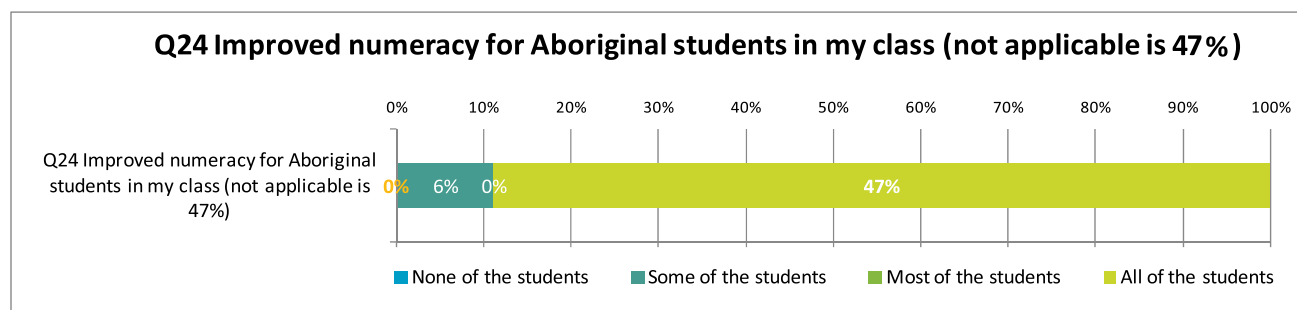
“That side of things I do like and I see the difference in the kids but I just think when they come back to class and they’re competing against 29 others it puts a bit of a downer on it... [the tutor] will say such and such did such a great job today. He didn’t get the results and he said let me have another turn and the second time he got it. But they don’t get that opportunity in class - it’s difficult.”

4.2.2 Outcomes for Aboriginal students

Fifty three per cent of survey respondents had Aboriginal students in their class. Of these, nearly all reported that QuickSmart has improved numeracy outcomes for all Aboriginal students engaged in the program. Only two respondents said that only some Aboriginal students have improved, as shown in Figure 4.2.

Improvements in numeracy outcomes for Aboriginal students were also observed by teachers in class activities. In particular, Aboriginal students were described as more willing to answer questions in class. One teacher suggested that previously her Aboriginal students would have waited to be shown the answer, rather than taking the risk of answering and possibly getting it wrong.

Figure 4.2: Improved numeracy outcomes for Aboriginal students



Across the schools visited, improvements in achievement and confidence were consistently attributed to the positive relationships developed between tutors and their students. One teacher explained the feature she saw as making a difference:

“I think when it comes to Aboriginal students, ...having access to a tutor who gets to know them - all those personal things that Aboriginal students respond to.”

Teachers and school executive indicated that most strongly, Aboriginal students' confidence and self-worth is enhanced by the program. One teacher highlighted that in addition to confidence, she observed enhanced abilities to:

“...take turns, to know what you do when you lose, what you do when you fail, how to pick yourself back up again and keep going and not to get too depressed about it or be too hard on yourself.”

Others emphasised the value of immediate feedback and students seeing small gains in achievement:

“...and their self-esteem and self-worth is enhanced by the program because they can see the small steps and gains they are making.”

“... academically he's doing a little bit better in his Maths but it's his self-concept that has really made the big change.”

This is particularly important for some individual students. In each school, teachers referred to specific children for whom the program was especially effective, such as:

“The little rewards are the things he loves. He knows when he goes [to QuickSmart lessons] that he has that positive affirmation and he gets something that he probably doesn't get at home. So even though he's grown slightly in his mathematical ability, I think the bigger picture for him is self-confidence and feeling a bit hopeful maybe. So in terms of his educational outcomes - yes, he can do your basic maths and he can cope when he comes back into the classroom with basic additions and subtractions quickly - but mainly it's to do with his self-confidence.”

Principals in two of the schools visited, reported improvements in attendance rates for Aboriginal students engaged in QuickSmart, as suggested here:

“... the attendance rates of specific [Aboriginal] children have improved significantly, and I believe and know that part of the reason for it is programs like QuickSmart, where they are feeling motivated.”

In contrast to these very positive reports, a few teachers and tutors indicated they had observed no differences in improvement between their Aboriginal and non-Aboriginal students. When asked if there were any differences in educational outcomes for Aboriginal students involved in the *QuickSmart* program, one teacher observed:

“I think [the Aboriginal students] achieved much the same as any other student.”

4.2.3 Other outcomes

Principals, school staff and parents all reported improvements for students in other areas such as:

- enjoyment of and engagement in numeracy activities
- increased self-confidence
- improved social skills and behaviour
- better attitudes to homework.

QuickSmart, according to staff and parents, boosted students' motivation and participation as well as building confidence and risk taking with their learning.

Engagement

The overwhelming response of most students is that they found *QuickSmart* very engaging. Evaluation data indicated that the response “*it is fun*” emerged with double the number of instances than any other factor. Making maths easier, helping with decimals or multiplication, or other specific aspects of numeracy were also frequently mentioned. One student exemplified the overall opinions of the students interviewed:

“I reckon it’s fun but it also helps you. It’s not boring Maths and you just have to sit there and learn. You can actually interact and stuff.”

Students commented on the aspects of *QuickSmart* that they most enjoyed or derived benefit from, in order:

- times tables
- card activities
- games
- computer activities.

Interestingly, several students commented that they liked the computer activities, but only if they didn't miss out on the cards or games. The importance of personal interaction with the numbers was frequently reinforced.

The ‘speed sheet’ activities (where students are tested on facts, against the clock) drew very mixed responses. Several students enjoyed these activities, and appreciated tracking their progress. However, twice as many students highlighted that they found them difficult, for reasons such as:

“I just can’t seem to do them in class.”

“I don’t like the speed sheets because I can’t think in my mind. I have to think out loud.”

Students' general enthusiasm for participating in *QuickSmart* sessions was the dominant message from both students and teachers. Deputy principals at two of the visited schools observed that students did not want to miss school if it was “*a QuickSmart day*”, and that parents had confirmed this.

Parents also frequently commented that their children were obviously enjoying doing *QuickSmart* and were demonstrably more engaged in maths, as shown in comments such as:

“[child] says ‘Mum, do a sum with me. Give me a sum, any sum.’ To me, that’s good.”

“She wants to do her times tables. At home she’s always adding things up.”

Teachers and tutors similarly observed that students enjoyed going to *QuickSmart* sessions, because they knew it was helping them and the program was well-presented.

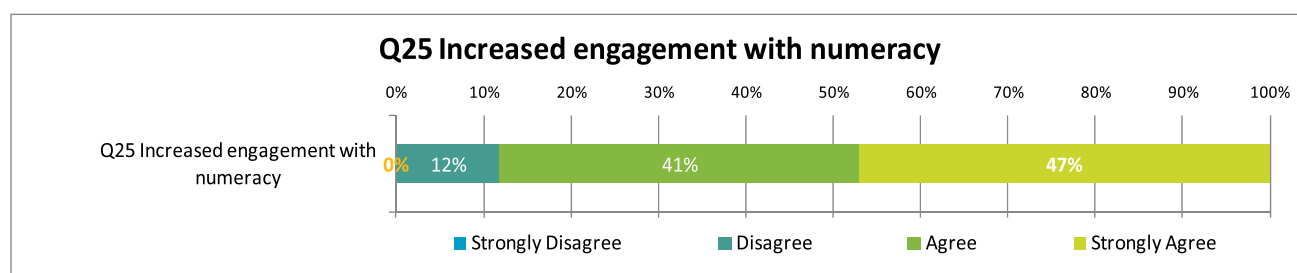
Teachers commented that participation in class activities had also noticeably improved. Better knowledge of basic mathematical concepts has resulted in students feeling more confident to take part and answer questions in class. As they noted:

“Some students have come to enjoy maths sessions because of their success [with QuickSmart].”

“The students attending QuickSmart are more confident in the classroom - across other aspects of numeracy and in [other] KLAs.”

As shown in Figure 4.3, most survey respondents (15 of the 17) agreed or strongly agreed that *QuickSmart* has increased students engagement with numeracy.

Figure 4.3: Increased engagement with numeracy



Enhanced student engagement with school in general, was a benefit also noted by teachers at each school visited.

Principals were confident that students were more engaged in the substance of lessons and frequently used the problem solving skills they had learnt. The range of strategies within *QuickSmart*, and the clear language of the strategies, were seen by principals as major factors in achieving successful outcomes for students.

Improved confidence

The improvement in self-confidence noted as a particular benefit for Aboriginal students, was also an outcome for many of their non-Aboriginal counterparts. The majority of tutors and teachers reported marked improvements in self-confidence and greater resilience for all students involved in the *QuickSmart* program.

A few teachers commented that students were progressing because of quick strategies and quick recall which helped to increase their confidence once back in class lessons. One teacher expressed that the students who failed to grasp basic concepts by Stage 3 had extremely poor self-esteem, but *QuickSmart* had helped these students gain the necessary confidence to experience success:

“A lot of them say ‘I can’t learn it because I’m dumb’ and they come with that attitude. QuickSmart changes that because they grow in confidence and [see] they’re able to do things.”

A number of teachers commented on student confidence increasing as a result of realising they can solve problems faster. One teacher indicated she thought the change in student confidence was “*amazing*”. Many teachers indicated the biggest change for students was in their self-esteem and confidence, as demonstrated in the following comments:

“... [Student] goes to QuickSmart, he comes back and he’s always smiling.”

“[I’ve seen] big changes in confidence, that they can actually do something that they found difficult. They surprise themselves a lot of the time.”

“It’s about confidence. They’re just much more comfortable with their basic maths problems.”

Students indicated that they felt less pressure in tests and felt more confident to attempt solving mathematical problems. Typical comments from students included:

“I don’t feel as much pressure when we come up to a big test.”

“I’ve done a few tests and they were really hard, until I started doing QuickSmart and it made it a lot easier.”

“... I used to be really nervous in Maths but now, [with] QuickSmart, I’m not as nervous.”

A number of parents indicated that their children were more likely to share their success at home because of their pride in knowing they “can do it”:

“Her confidence has improved... it’s not as scary anymore, and she can do it, and I know I can go ‘what’s 6 times 6?’ and she can quickly get back to me without the pout and the ‘hang on’ - and that’s in half a year, really.”

Parents confirmed increased self-confidence for their children. For one parent this was seen as an improvement that could be transferred to other aspects her son’s school life:

“He also seemed to be more confident and I think that was a really good thing so that he could take that confidence to other areas of school, classroom and playground.”

An assistant principal agreed that students’ confidence helped them in other subject areas as well as numeracy:

“The students attending QuickSmart are more confident in the classroom across other aspects of numeracy and KLAs.”

A number of staff at one school commented that students involved in the QuickSmart intervention had attained leadership roles within the school. Previously they would not have had the confidence to even aspire to such activities.

Students’ increased self-esteem and confidence is largely attributed to the one-on-one approach, the personal support and rapport developed between students and the tutor.

Improved behaviour

A number of teachers and tutors commented on improved behaviour from students involved in the QuickSmart program. Once again, the focus on individual students and building rapport was seen as a factor in contributing to changed attitudes. As explained by tutors:

“When some of the children who are the ‘trouble makers’ come to QuickSmart, they were different kids and you keep that relationship up, saying ‘how you going’, ‘are you being good?’ and they are. To my understanding, they are because they had a special thing that was just for them, they enjoyed it, ... got them on a level where someone was taking the time to explain it in their level, not a whole-class level. Some of the kids’ behaviour has really excelled because they’re a part of something now”

Teachers reported that tutors managed to work with some difficult students, and they were surprised at the changes in behaviour, as one teacher commented:

“I was surprised as far as behaviour and response [goes]. [Tutor] has taken some pretty tough kids up there and managed to turn some around. In that respect, it’s fine and I’m sure when you look at the results and the graphs and tables, you can see that it’s worked, and the attitude is a whole lot better.”

One principal summed up the social as well as academic improvements:

“It’s hard to put a price on kids’ competence in general, their social skills as well as their maths outcomes.”

4.3 Effects of withdrawing students from class

Withdrawal of students from mainstream classes for individual interventions often has mixed effects for students. Benefits include the intensive support provided, often by tutors who are able to build a strong relationship with their students. Disadvantages come from the time taken away from other activities (school-based or social) or the stigma that may be attached to being withdrawn from class.

As demonstrated earlier, in the vast majority of cases, students were enthusiastic, and looked forward to attending the *QuickSmart* sessions. In addition to the qualities of the program itself, the strength of relationship built with the tutors was seen as the key factor in creating change. Intensive sessions, three-times-a-week for 30 weeks allows for significant trust and caring to be built between tutors and students. When students are asked what they like about *QuickSmart*, tutors appear high on their lists. One teacher noted the impact of quality tutors:

“The strength also comes from the tutor believing in the student and helping them to achieve their personal best.”

Parents were very aware of the importance of the tutor to their children, as expressed in the parent interviews:

“I think the tutors at the school are very dedicated and I’m very sad that [my daughter] is coming off [the program] and I think she is too.”

“... the instructors that the school brought in were not necessarily teacher type people and they were interested in the children and we would get reports back saying ‘Mrs tutor this, Mrs tutor that’. It was just - I really felt she helped his confidence a lot.”

Tutors acknowledged the importance of students being well-matched with their *QuickSmart* partner. Sometimes pairs needed to be changed because their rates of progress were significantly different; they didn’t get along, or got along too well; or their competitiveness hindered their work during *QuickSmart* sessions.

Overall *QuickSmart* sessions did not seem to cause any major issues for teachers and students in any of the schools visited. In some cases students were timetabled for alternative activities and so withdrawal for *QuickSmart* sessions was not seen as unusual practice.

The stigma that can sometimes accompany student withdrawal from class, was not manifest in any of the schools visited, nor was it mentioned in survey responses. In fact the opposite was noted by teachers and parents; participation in *QuickSmart* was regarded as a positive thing, a privilege. Parents and teachers described the situation:

“I actually think there’s envy, it’s a positive thing across the kids as a whole. Where they’re pulled out for remedial reading - there’s a stigma: ‘You’ve got problems with your reading’ but this doesn’t seem to be the same thing. [Instead] it’s ‘You’ve got problems with your numbers, this is going to enhance your numbers’.”

“Well I don’t think QuickSmart is seen as a negative thing - kids are not laughed at or anything like that.”

To his surprise, the deputy principal at one school described it as a “phenomenon” when it came to choosing students to be involved in the second round of *QuickSmart*:

“It’s interesting that a phenomenon happens, and it comes from the children. It doesn’t matter how much we might think, or their parents tell them it’s a good idea, because they talk about it themselves and they enjoy it. I get a group together for a briefing for next year, and give them their letters to go home, and I usually get a number of students saying ‘Yes!!’ while they’re still there. So, that’s fairly rare for a withdrawal program.”

One tutor, however, indicated that one of her students felt it was like a punishment:

"I know one of the other boys has said something about it feels like a punishment in a sense because they have to do two lots of work..."

"in terms of what they miss in the classroom, every teacher would be a bit different but they do have to try and figure out what they have missed and catch up."

The biggest concern expressed by students is that they miss other subjects that they enjoy, especially when they are withdrawn at a regularly scheduled time.

Parents, on the other hand, stated their children did not feel disadvantaged by being withdrawn for QuickSmart. As one parent noted:

"It's all very positive on our end - [my child] came off, and then there was a spare spot and she went back on again, and she loves it. It's not... you know, when kids are withdrawn from class they feel a bit targeted? She loves going. She doesn't mind missing whatever is happening in the classroom to go to it."

Teachers noted some minimal disruption, especially when students leave the class part way through a lesson. They observed that other students struggled:

"It's just, well, frustrating for the students as well - where they're in the zone of learning and [it's] QuickSmart time. Not that they say 'Oh I don't want to go' - it's more 'I just wanted to finish this.' Or something like that. But I don't think there is anything we can really do about it. It's just that frustration."

The general consensus, from both survey and interview responses, was overwhelmingly positive, as summed up by one teacher's comment:

"I think the fact that they go out so many times is great. It may affect them in other areas. They may miss a little bit of stuff, but what they miss there they gain tenfold by doing QuickSmart."



5 Teacher and tutor perspectives

Section 4 presented insights into how well *QuickSmart* contributed to students' achievements. In this section the focus is on teachers' and tutors' experiences with the program and the effects it had on their own practice.

Key findings:

- Overall, teachers and tutors understood the purpose and principles of *QuickSmart* and believe it to be a very effective intervention for the targeted students.
- Some teachers indicated that they had incorporated *QuickSmart* strategies into their general numeracy lessons.
- School executive indicated that a *QuickSmart* school coordinator was essential to the successful implementation of the program, especially to manage the data requirements from SiMERR.

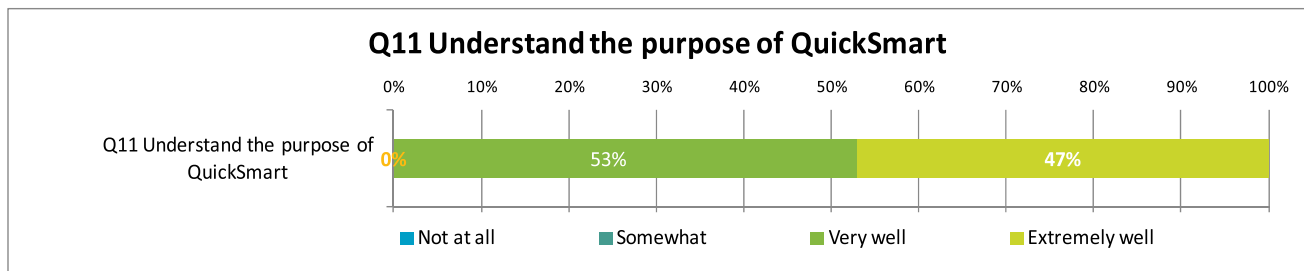
5.1 Teachers' and tutors' overall views of *QuickSmart*

Respondents to the online teacher survey strongly supported the program. Fifteen of the 17 respondents (88%) described *QuickSmart* as very effective or extremely effective, with the other two saying it was somewhat effective.

All respondents agreed or strongly agreed that they would recommend *QuickSmart* to a colleague.

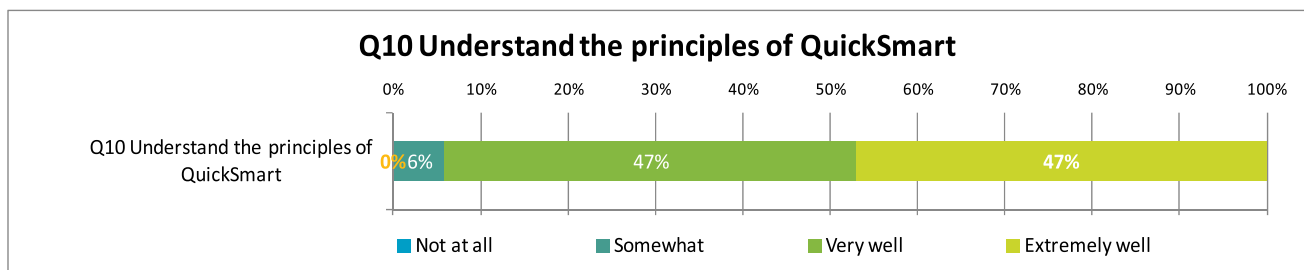
Figures 5.1 and 5.2 show teachers' and tutors' responses to questions about their understanding of the principles and purposes of *QuickSmart*. All survey respondents indicated that they understood the purpose of the *QuickSmart* intervention very well or extremely well (Figure 5.1).

Figure 5.1: Teacher and tutor understanding of the purpose of *QuickSmart*



Almost all survey respondents indicated they understood the principles of *QuickSmart* with only one respondent indicating they understood only somewhat (Figure 5.2).

Figure 5.2: Teacher and tutor understanding of the principles of *QuickSmart*



Both teachers and tutors indicated that the *QuickSmart* program clearly achieved its goal of increasing students' ability to easily and quickly recall number facts and perform basic computation skills, as observed by one teacher:

"... now they've moved up, you know, way up the ladder. They're more towards the top of it because of the self-confidence, because of the skills and they're so much quicker at things. It really does teach them quick recall and quick strategies."

Teachers felt confident that the program was well-researched and “backed by a whole lot of data”. More specifically they identified a number of features they believed made *QuickSmart* effective, including:

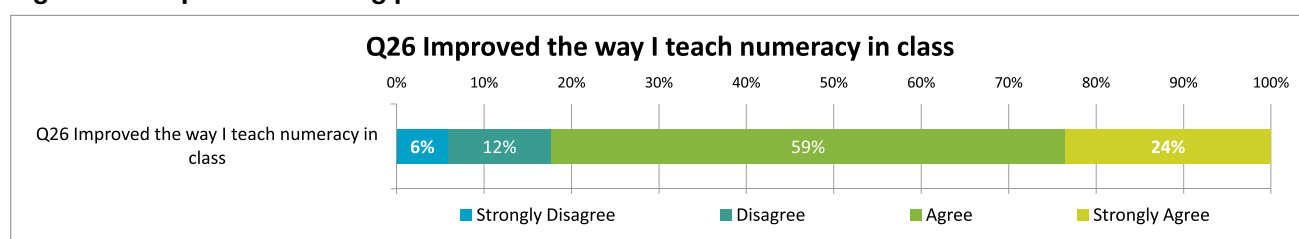
- targeting the “right sort of kids”
- focussing on basics and providing students with strategies to understand those basics
- use of very engaging activities and repetition to achieve automaticity.

A number of teachers indicated that the principles of *QuickSmart*, in particular focusing on strategies to achieve automaticity, were principles they were incorporating into their class-based practices.

5.2 Changed practices

The majority of teachers surveyed indicated that their involvement with the *QuickSmart* program has led to improvements in their teaching practice, as shown in Figure 5.3.

Figure 5.3: Improved teaching practice



Through the interviews, however, few teachers reported changes in their teaching. Several teachers suggested that the whole-class NPLN maths intervention *TOWN*, had a greater influence on their teaching practice than *QuickSmart*. These teachers had not been part of the *QuickSmart* training and they reported not having much exposure to the specifics of the program.

A few teachers did report some change, in that they now:

- better recognise who needs assistance
- use the times tables slides (occasionally)
- prompt students to think of and use the *QuickSmart* strategies they've learnt in tutoring
- discuss the strategies with the whole class
- use the problem solving strategies with all students; in one case they are used across the school.

In one school, the deputy principal identified the value of *QuickSmart* in encouraging teachers to reflect on their practice:

“think it’s focused attention in my stage three teachers and certainly it’s focused us as teachers on what do we know about problem solving, and how to teach it.”

Many teachers expressed a strong desire to extend the use of the *QuickSmart* strategies into regular maths lessons, not only to further support their *QuickSmart* students but to reinforce numeracy skills for all their students. One teacher commented on the number of students in her Year 5/6 class that, for whatever reason are not confident with their times tables.

Another teacher reported she had started using maths groups within the class, a strategy she had previously not implemented. In doing so she was able to accommodate different skill levels, and using *QuickSmart* strategies, give her lower achieving students “a chance to shine.”

An unexpected response to the withdrawal program emerged in a couple of instances, where teachers expressed a reduced need to cater for the *QuickSmart* students in their class maths lessons. Teachers frankly explained:

“I find that I don’t feel guilty or obliged to sit with those kids as much because I’m thinking they’re getting an hour and a half at least a week one-on-one. So I have found that I haven’t dumbed down the work as much, and I’m probably pushing the other kids more because I’m thinking well – sometimes in the past they wouldn’t get it so you’d go back for them but if it’s just them that’s not getting it – to be honest, well let’s move on anyway because you are getting enough time as it is.”

“That’s one thing I’ve noticed that’s changed with my teaching. I’m probably sitting more with the average to the top kids, than the average to the bottom kids, which I think is good because I’ve got pretty bright kids who probably in the past might have been at times bored having to go over stuff they were pretty good at. Whereas now I don’t feel as guilty to definitely make sure those kids catch up because, I think, in a class situation they’re not going to get what they get one-on-one anyway.”

The danger is that teachers may assume students are receiving all they need through the withdrawal session.

5.3 Support for implementation

School leaders and teaching staff were consistent in their conviction that *QuickSmart* can only be effectively implemented with the support of a qualified program coordinator. As one deputy principal commented, the tutors, even though trained, do not have the background to independently manage the educational aspects of the program:

“It is not possible to expect parents [tutors] even with the training, to run that program and get all of it organised, and understand how to put groups of children together, etc.”

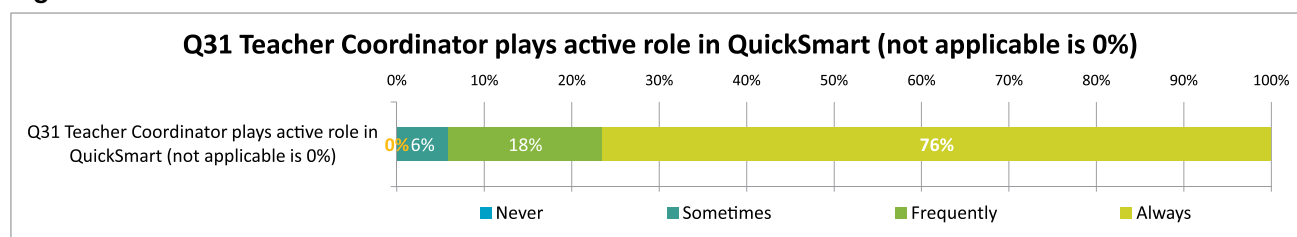
Coordinators themselves highlighted the importance of having undertaken the *QuickSmart* training, and perhaps even having engaged in some tutoring sessions, so they thoroughly understand how the program operates and the issues that may emerge. One coordinator suggested:

“I think it is really important that the coordinator knows how it works. I also took a pair of students, when it first started... I made sure I did it because in answering the tutor’s questions, you don’t actually understand unless you have that half an hour with a pair of students. I think it is very valuable that you understand that.”

5.3.1 Role of the coordinator

All survey respondents indicated that there was a dedicated *QuickSmart* coordinator in their school. Nearly all teachers and tutors surveyed indicated that the *QuickSmart* coordinator plays an active role in the program, as shown in Figure 5.4.

Figure 5.4: Role of *QuickSmart* coordinator



In interviews, teachers and tutors strongly reinforced this idea. Tutors were most appreciative of the support provided by the coordinator, and by class teachers.

Across the range of schools, the role and value of the coordinator was reported to involve:

- supporting, directing and providing feedback to tutors, especially those who do not have a teaching background
- establishing and managing the tutoring sessions, including organising spaces, allocating resources, liaising with teachers, and timetabling
- liaising with parents, particularly providing authoritative feedback
- selecting students to take part, and matching students in their pairs
- training new tutors, and ongoing training, as required
- managing data analysis requirements and reporting to SiMERR.

Much of this work is very time consuming, and was not always allowed for in the initial planning undertaken by schools. Coordinators spoke of the workload being particularly heavy at set times through the year, or through the life of the program:

“... then it is an extra task to do, particularly at certain points throughout the program. Once the tutors are trained and up and running, it’s ongoing maintenance things.”

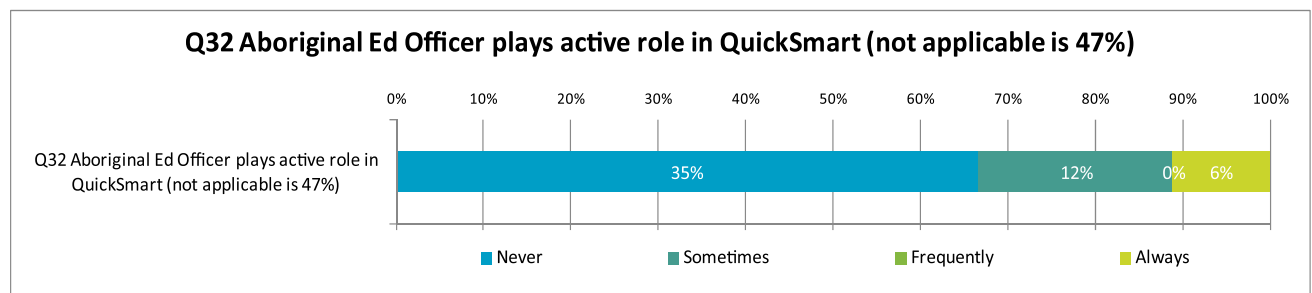
“The major times are when there is a changeover of students... so it does take a fair bit of organisation and communication with them to get that all sorted at the changeover time because you’re post-testing one group, and pre-testing another group and ...”

The major workload issue that emerged from teacher interviews was fulfilling the mandatory data requirements of the program. This issue is discussed further in Section 5.4.

Support from the *QuickSmart* team and working closely with teachers also assists the coordinator to make the program work efficiently.

Unfortunately, Aboriginal Education Officers (AEO) were not often enlisted to provide support for tutors or students, as shown in Figure 5.5.

Figure 5.5: Aboriginal education officer participation



It is noted that half of the respondents did not have an AEO in their school. However, of those who did, almost all said the AEO never or only sometimes played an important role in *QuickSmart*.

5.3.2 Support networks

The *QuickSmart* school networks were not established for new schools entering the program under the NPLN. Those tutors who were part of an existing network commented on the value of being able to meet with other tutors, from other schools and share experiences.

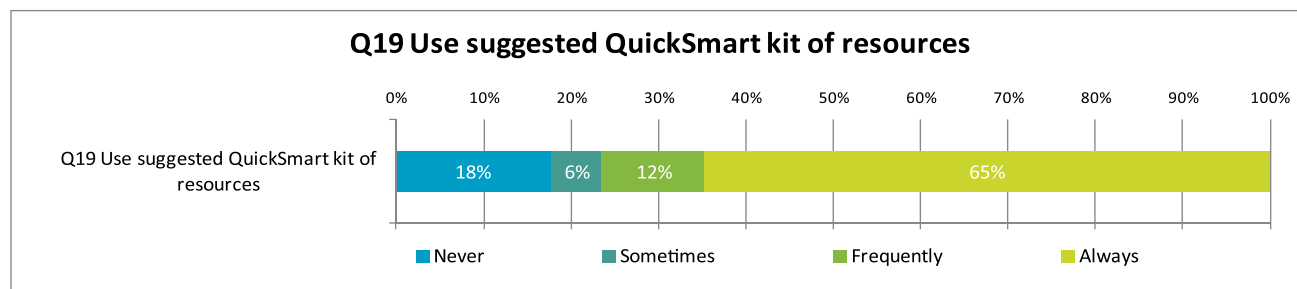
In the schools visited, most tutors and coordinators indicated they would like to participate in a network, especially those who felt isolated from other *QuickSmart* schools. They could see the value in such a professional learning exchange. One *QuickSmart* coordinator identified that a support network was needed for his tutors, and despite attempts to get the network going, it didn’t eventuate in any formal way.

5.3.3 Resources

Teachers and tutors were positive about the resources provided with *QuickSmart*, and frequently commented that they felt it was one of the strengths of the program. Principals and coordinators commented that the resources were clearly set out and user-friendly, enabling tutors to run the program with minimal assistance.

As indicated in Figure 5.6, all except three respondents said they utilised the suggested classroom resources, and 12 (77%) said they used them frequently or always.

Figure 5.6: Use of the *QuickSmart* resources



At one school, *QuickSmart* resources, such as flashcards and spreadsheets, were being used across the school in maths lessons.

Video conference support

Late in the implementation, the Department started to run video conferences for tutors and coordinators. The difficulty in finding a time that suited all participants across *QuickSmart* schools was a significant barrier, as noted by one coordinator:

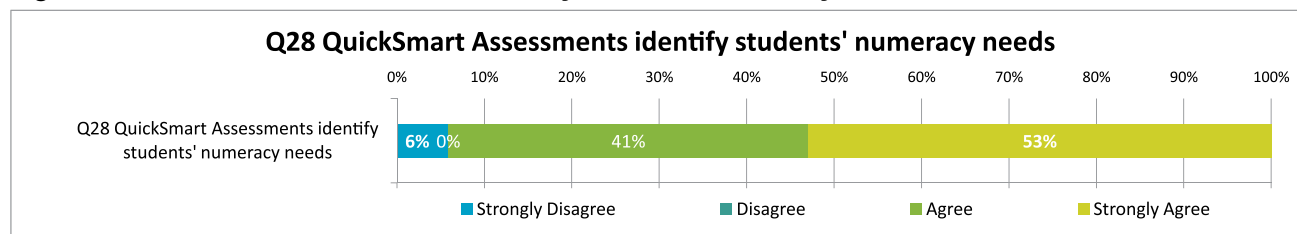
“Unfortunately for us they’re in the middle of the day which makes it difficult because I’m on class and the [tutors] have got QuickSmart sessions. Finding a right time for them would be tough because people are at QuickSmart at all different times of the day and different days, so it’s a tough one to try and overcome.”

5.4 Assessment

As indicated in Figure 5.7, nearly all staff agreed or strongly agreed that the assessments used in *QuickSmart* provide useful diagnostic data to inform the development of individualised programs for participating students.

Similarly, nearly all staff surveyed indicated that *QuickSmart* assessments show where support is needed.

Figure 5.7: *QuickSmart* assessments identify students’ numeracy needs



Data collection, analysis and reporting in *QuickSmart*

School participation in *QuickSmart* requires engagement with the SiMERR registration and assessment processes. Detailed data must be submitted for all students before they can be registered to take part.

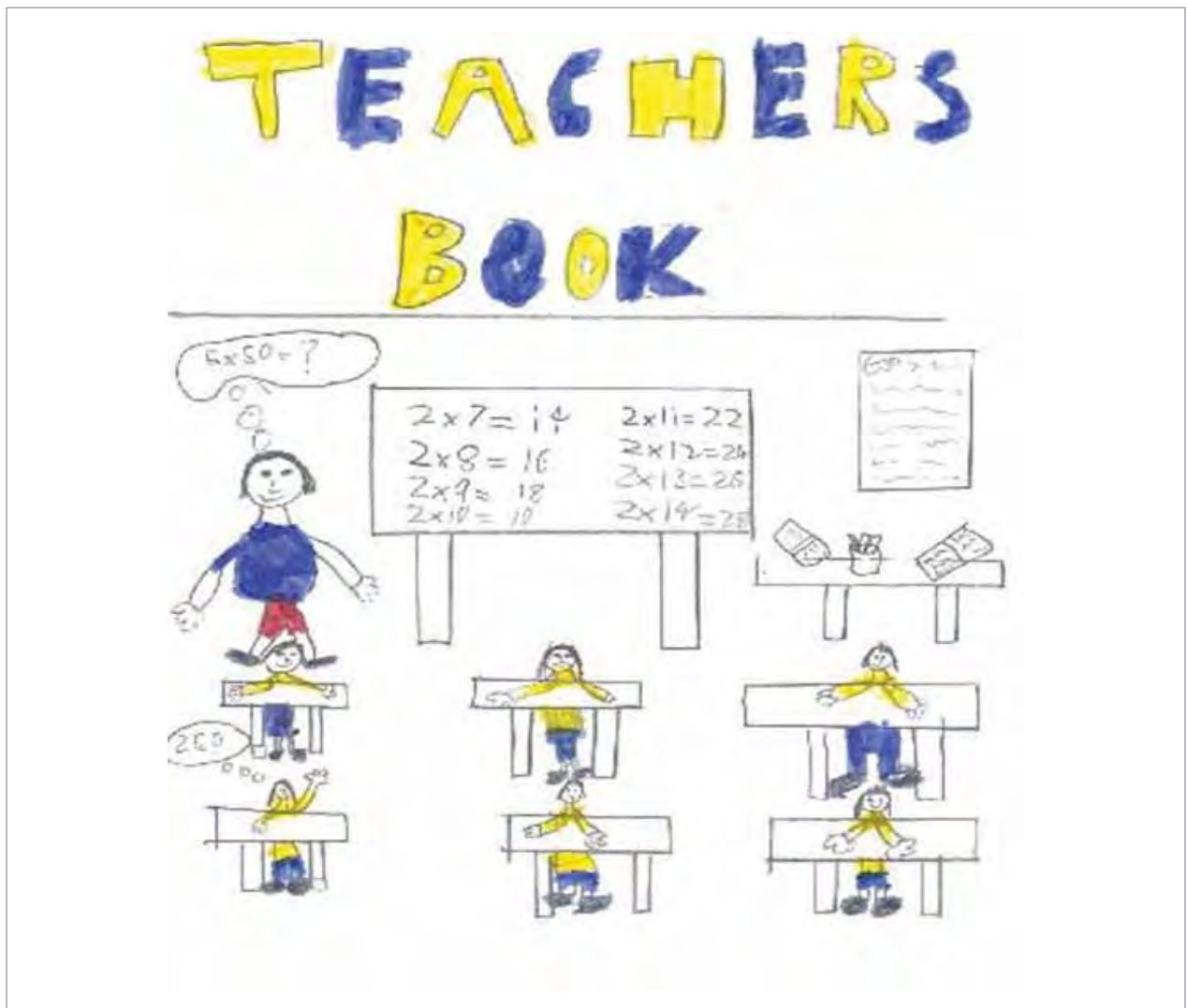
QuickSmart coordinators reported that collecting assessment data was both time-consuming and frustrating, as it asks for individual sheets on every child, with data repeated at several points:

“... it’s also supposed to be done three times for comparison of students as well, and that’s an awful lot of paperwork to do and we find ourselves doubling up on a lot.” Coordinator 1

“It takes a lot of time and it’s supposed to be done at the beginning, pre-testing and post-testing and it’s also supposed to be done halfway and middle [UNE requirement].” Coordinator 2

Coordinator 2 went on to comment that she felt it was an issue that the QuickSmart developers would be prepared to work on. She continued:

“I’d like to streamline [the reporting] a bit. I’d like to give them the information that they need to keep up to date with the progress for UNE but I’d also like to figure out how we can do it without writing everything out fifty times - so it’s an area I’d like to work with them on.”



6 Impacts in schools

This section examines the effect that implementing *QuickSmart* as part of the National Partnership on Literacy and Numeracy (NPLN) has had on the organisational unit of the school itself.

Key findings:

- To date *QuickSmart* has had limited impact on the culture or practices of schools as a whole.
- The effectiveness of the *QuickSmart* program has led some schools to consider developing whole-class programs based on the strategies.
- Parent involvement had increased as a result of *QuickSmart*, with many parents indicating their desire for the program to continue.
- The employment of tutors is the critical factor in the determination of sustainability for schools.

While the focus was on introducing the *QuickSmart* program, it is important to remember that *QuickSmart* was implemented in the context of the NPLN as a whole. It is difficult to isolate the effects of the whole-class intervention, leadership initiatives and the focus on using SMART data, from the changes in practices stimulated by *QuickSmart*. It is acknowledged that the changes described in this section have resulted from the combined effects of all aspects of the NPLN initiatives.

Teachers and principals have overwhelmingly reported that the implementation of *QuickSmart*, in tandem with the whole-class intervention *TOWN*, has had a positive impact on improving students' numeracy outcomes. In many cases improvements in students' social and motivational behaviours have also been noted.

Because of its very focused nature, *QuickSmart* has had limited impact for the participating schools as a whole. However, principals and teachers have recounted a range of views on the more comprehensive benefits that *QuickSmart* may offer into the future.

6.1 Limited impact on the whole school

QuickSmart is designed to be delivered directly to students, outside the class environment. The strategies aim to develop automaticity for those students who have not yet attained this skill. Accordingly, the program's applicability for all students is questionable, and there is little expectation that it would have an immediate impact on the school as a whole.

To date there appears to have been minimal widespread impact on the practices of class teachers across the schools involved. The benefit of the program was derived specifically from the gains made in improving individual student outcomes through the withdrawal program.

However, the impressive outcomes recounted by participants have led most schools to look at how such success may be experienced by all students.

6.2 Continuing with *QuickSmart* practices

In the context of limited resources (even with NPLN funding) schools reported having to make difficult choices about which students may take part in the program, especially given its 30-week duration. Several teachers identified the much wider need that exists in their classes for *QuickSmart*-style activities. One teacher commented that:

"I've got a lot of children in Stage 3, Years 5 and 6, who still can't do times tables or can't remember them, or haven't learnt them. So I think it is important that they have those strategies and I think by implementing the program [in classes] then everyone gets a fair go at it."

6.2.1 Building school capacity

As part of their participation in NPLN, some schools invested significant resources in training all teachers and support officers, in preparation for a longer term commitment to the program.

At the same time, *QuickSmart* problem solving strategies and some of the practice activities and resources were identified by teachers as useful additions to their teaching repertoire, especially as students enjoyed them so well. One principal explained:

“We have actually implemented the QuickSmart problem solving strategy across the school; so we’ve made posters and laminated grids for every child in the school, to be able to work through the problem solving.”

Without exception, each of the visited schools already had plans in place for some version of *QuickSmart* to be continued in their schools. Data from the visited schools reveals that the impetus for continuation of the program comes almost equally from teachers and from school leaders. In one school the assistant principal pointed out:

“As an executive we have worked with staff to demonstrate what QuickSmart is and how it could be used as an integral part of classroom management to improve recall of facts and promote problem solving.”

Another principal commented that the use of *QuickSmart* strategies across the school is an area the school would like to work on beyond 2011:

“I would like to extend. We’ve certainly talked about it, and had requests from the Year 4 teachers to implement some of the strategies that they’re using, whether it’s the speed sheets, and certainly the focus facts - some of the strategies that the tutors have, extending that and putting those into classrooms as well.”

Teachers generally agree, talking of the value they see from the program and the potential for all students:

“...every teacher you speak to has positive things to say about it so probably in terms of a whole school thing it would definitely be positive.”

There was little discussion of how whole-school implementation might be achieved, aside from those schools where training of teachers had already taken place.

6.2.2 Cost effectiveness

It was frequently acknowledged that *QuickSmart* was an expensive program to implement in any school. Costs associated with training and employment of tutors may prevent some schools from continuing the approach as an individual-student intervention, as discussed in Section 6.4.

As a result, it is the incorporation of *QuickSmart* strategies into Stage 2 and 3 classes that some schools see as an effective way to build on the investment made through the NPLN.

The efficiency of the program in achieving outcomes improvements for students was so impressive that one principal indicated he would pay anything to keep the program operating within the school:

“If I had a million dollars, and that’s what it cost, I would pay a million dollars for QuickSmart because of the effect that I’ve seen it have on the kids.”

6.2.3 SiMERR support and *QuickSmart* literacy

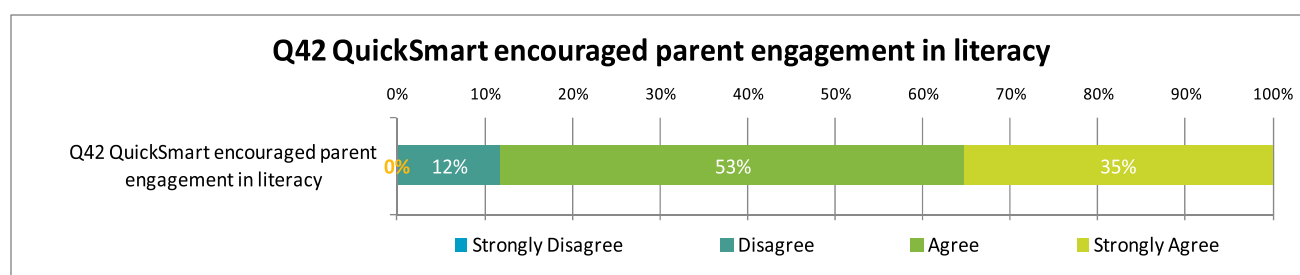
Some schools developed a good relationship with SiMERR at UNE, and utilised their expertise in implementing the program. The staff at one school was so impressed with the effectiveness of the *QuickSmart* intervention, that they were examining the possibility of implementing the *QuickSmart* literacy program also developed by SiMERR:

“The closeness of UNE has certainly helped. We’ve built up quite a good rapport with UNE and the SiMERR people there with QuickSmart. We’ve found them to be quite an invaluable resource. We’re actually looking at trying to implement the QuickSmart Literacy program as well.”

6.3 Parent and community involvement

As shown in Figure 6.1, almost all survey respondents indicated that the introduction of *QuickSmart* had increased parental involvement in the school.

Figure 6.1: Increased parental involvement



Parents were also enthusiastic participants in the evaluation process at each school visited. They expressed strong feelings about the positive impacts of *QuickSmart* for their children.

There were mixed responses, however, regarding the amount of initial information provided about the *QuickSmart* program. A number of parents indicated that the school had organised information sessions for parents, and some had taken up the offer to observe the program in operation.

Conversely, many others indicated that they had received little or no information. A few were unaware of their child's participation until several weeks into the program, and certainly did not recall providing permission:

“I actually found the timetable in his bag and I said ‘What’s this timetable for?’ and he said ‘I’m in the QuickStart (sic) program’. I said ‘What’s that?’”

“[she has a] friend in the netball team who does it at another school. She explained the whole process too me, so now I understand it.”

Irrespective of the early communication issues, parents were universally pleased that their children were involved. As discussed earlier in Section 4.2.1., they were impressed by the changes they observed in their children's numeracy skills and attitudes to maths.

One principal indicated that parent enthusiasm has encouraged the decision to keep the program continuing:

“I’ve got parents wanting us to keep this program running because they’ve seen the benefits of it. When we started choosing children I had parents ring up and say: Why wasn’t my child picked? I want them involved. I’ve heard how good it is.”

6.4 Sustainability

Principals and teachers were asked about the extent to which *QuickSmart* was seen as sustainable in the school. The immediate response was almost always:

“QuickSmart is only sustainable in our school with funding.”

After further consideration, three distinct possibilities emerged:

- obtaining additional funding from a new external source, or cancelling the program
- identifying a funding source within the existing school budget
- incorporating the tutoring role into the workload of support teachers, or volunteers.

Principals indicated that their assessments clearly demonstrated improved outcomes for students involved in *QuickSmart*. In view of this, it was felt it would be educationally unsound to discontinue a program that is proving to be beneficial for those students most in need of extra support. Several principals made comments such as:

“The money invested in setting up resources and systems and getting tutors trained is too valuable to lose.”

“Our school assessments show it’s worked and in this day and age if you find something that works you need to try and keep it going and a lot of money... has been invested in the resources, in the training, and I think - plus the success we’ve had - I think it would be silly not to try and make it happen - but it costs.”

Nearly all principals and school staff indicated that *QuickSmart* strategies would be continued within the school, but budgets will determine the extent to which they are able to continue with the individual withdrawal program, in association with SiMERR.

Ongoing funding requirements

Ideally, ongoing funding is required for:

- (at least) fractional relief provided for the *QuickSmart* coordinator
- employment of tutors
- purchase of additional resource kits
- contingency funds for further training, as required.

Coordinators highlighted that their role in the success of *QuickSmart* was frequently overlooked, as described by one principal/coordinator:

“... but the workload it’s put on myself and my staff and the pressure it has put us under at times is really – we haven’t been compensated for that.”

Funds to support the coordinator were seen as necessary for effective implementation irrespective of who was employed as tutors.

While the other costs are important, the ongoing employment of tutors is the critical factor in determining whether delivery of the individual-student program is sustainable. Typically teachers made comments such as:

“I think the only real barrier with it is to find the money for the tutor.”

“Once you’re set up - you’re basically set up to do it, and your main cost is your tutor.”

Retaining existing tutors was an added imperative for principals, as demonstrated by comments such as:

“... and if you have to keep retraining tutors all the time or they’re not doing a great job then you don’t get the best out of the program.”

“We certainly don’t want to do anything about changing our tutors; we want to keep them happy. The program isn’t any good if you haven’t got good teachers doing it, and we’ve got the best.”

Decision to fund from other sources

All four principals in the schools visited confirmed that it's likely that they would 'find' alternative funds to maintain the individual student intervention.

Allocations could be made from other funding areas, such as Priority Schools Program (PSP), National Partnership for Low SES Schools, or annual Learning Assistance Program (LAPS) funds.

Principals acknowledged the dilemma of this solution: that other initiatives would be disadvantaged, as explained:

"... then what happens to kids in Kinder to Yr 1 who might need phonemic awareness and other skill building? Our STLA strongly supports ES1 and S1 and the Learning Assistance Program (LAP) supports students having difficulty ..."

"If we did that, it would take away from the [other] program because they all work up until lunchtime, and then we use them for other programs through Special Ed funding and all sorts of things..."

The real challenge is to find the balance between the needs of different groups within the school.

While principals indicated that they were able to continue funding the program into 2012 using other funding sources, it would be an additional challenge to find funds to continue providing the individual intervention on a long term basis.

"It is a wonderful program and it has brilliant outcomes, so to say do you have the money...well we have to try to find it somewhere."

Alternative strategies

In several cases volunteers or existing support staff were suggested as alternatives to the additional employment of tutors. Similar difficulties were identified with this alternative, including:

- potential loss of existing, highly-valued tutors, once they are no longer paid
- diversion of STLA, SLSO or AEOs away from their current support activities.

One of the survey respondents pointed out the problems with these suggestions:

"Continuing QuickSmart within the school in the future will rely on some creative and innovative planning. By using STLA, AEOs etc, a sustained approach can be maintained. Using volunteers is an option but this does not necessarily provide consistent delivery of the program which is imperative for success."

The final suggestion grows from an idea to extend the program throughout every class, with teachers incorporating the strategies into their regular numeracy activated. Several teachers expressed their willingness to go this way, as suggested here:

"Given the appropriate training, I would implement parts of the QuickSmart program into my numeracy lessons."

In summary, while not having a huge impact on whole-school change due to the individualised and targeted nature of the intervention, *QuickSmart*, has stimulated teacher thinking and prompted the school communities to evaluate the ways they can best support students, both individually and across the school.



Every thing you
to know about maths

About.



24710
Maths.



7 Summary of findings and conclusions

This section provides a summary of the efficacy and impact of *QuickSmart*, as it emerged through the evaluation. Findings from both quantitative and qualitative components are drawn together to address each of the Terms of Reference related to numeracy, as follows:

- assessment of the effectiveness of the program
- assessment of the extent to which the program achieves its goals in an efficient manner and where applicable, addresses the mandatory reform elements of the NPLN, which are:
 - effective and evidence-based teaching of numeracy
 - strong school leadership and whole-school engagement with numeracy
 - monitoring student and school numeracy performance to identify where support is needed
- assessment of the extent to which the program has improved the educational outcomes of Aboriginal students
- investigation of the most effective ways for schools to be supported to participate in the evaluation and for the reforms to be incorporated into school practice.

The impact of *QuickSmart* on the learning outcomes of the targeted students has been the most significant outcome revealed through the evaluation.

QuickSmart was implemented concurrently with the whole-class numeracy program, *TOWN*. As such, it is difficult to attribute improvement in student outcomes to one approach or program alone. The other components of the NPLN may also have bolstered the effectiveness of *QuickSmart* implementation.

The location of participating schools in the New England and North Coast regions of NSW, in proximity to the University of New England has significant bearing on their experiences of the program. Timelines and funding were factors that were not always within the organisational control of participating schools. These limitations are taken into account within the following summary and conclusions, as appropriate.

7.1 Assessment of the effectiveness of *QuickSmart*

This section summarises the range of evaluation findings related to each set of stakeholders: students, teachers and tutors, and the school community.

7.1.1 Effectiveness of *QuickSmart* for students

While a clear finding of this evaluation was that *QuickSmart* has improved the numeracy outcomes of most students, greater support for this proposition came from teacher surveys and qualitative data gathered from interviews with teachers and students, than from broad-scale testing.

NAPLAN and NPLN assessments

As noted earlier, in schools implementing *QuickSmart* as their individual-student intervention, the majority of students taking part in the program were in Year 5 or Year 6. Accordingly, the influence of *QuickSmart* on student performance is unlikely to be evident in these NAPLAN or NPLN assessment results. However, it is worth noting the following results for *QuickSmart* schools.

The results in 2010 for Year 5 students show an improvement since Year 3 in numeracy performance for all cohorts, by about the same amount as the whole of the state. The 2011 results for Year 5 in *QuickSmart* schools show greater improvement than for the whole of the state, with the exception that Aboriginal students in those schools improved their performance by about the same as the whole of the state in 2011.

In NPLN assessments, gains in mean numeracy scores were observed for all student cohorts at *QuickSmart* schools. NPLN assessment data also indicates that the gain scores for Aboriginal students were higher than those for non-Aboriginal students.

School-based views of student outcomes

The primary assessment measure used with *QuickSmart* is the Cognitive Aptitude Assessment System (CAAS), implemented as part of the program. Tutors reported students' successful progress through the activities and accompanying assessments.

Teachers consistently reported improved performance in class-based mathematics assessments and were able to track student progress over time.

Improvements were reported for students in other areas such as:

- enjoyment of and engagement in numeracy activities
- increased self-confidence, and greater willingness to participate in class activities
- improved social skills and behaviour
- better attitudes to homework.

Some evidence demonstrated the ability of students to use what they had learnt in new and different situations. Students highlighted [numeracy-related] activities that they felt more confident doing, both at school and especially at home.

Students found *QuickSmart* to be fun as well as helpful. They enjoyed the range of activities and suggested they were preferable to their class maths activities. This has implications for the nature of activities presented in class mathematics/numeracy lessons.

Consistent with the recommendations of the SiMERR program providers, some teachers and tutors found *QuickSmart* to be more effective with students in Years 5 and 6, rather than Year 4.

7.1.2 Effectiveness of *QuickSmart* for teachers

Building teacher capacity was a key intention of the NPLN. Because of the focussed nature of the *QuickSmart* program, the extended professional learning program provided positive results for tutors, and for those teachers who took part, but was not otherwise widespread.

Teachers reported becoming at least familiar with the *QuickSmart* strategies, and saw value in their use with all students. Respondents to the teacher survey indicated that their understanding of *QuickSmart* principles and strategies had improved their numeracy practices in general.

Following comments made in teacher interviews, care is needed to ensure that an intensive withdrawal program such as *QuickSmart* does not lead to teachers absolving themselves of responsibility for the numeracy learning of those students taking part in the intervention.

7.1.3 Effectiveness of *QuickSmart* for school communities

To date *QuickSmart* has had limited impact on the practices or culture of participating schools as a whole. However, the effectiveness of the *QuickSmart* program has led some schools to consider developing whole-class programs based on the strategies.

Parent involvement had increased as a result of *QuickSmart*, with many parents indicating a strong desire to see the program continue.

While the introduction of *QuickSmart* appears to have had minimal influence on overall school culture, some impacts were identified by principals, including:

- establishment of strong relationships between the school and tutors, between teachers and tutors and between tutors and students
- improved behaviour and attitudes to mathematics among targeted students
- teachers using *QuickSmart* strategies with students in class numeracy lessons
- the professional learning model was seen to have potential to increase teacher and school capacity to implement *QuickSmart* strategies beyond the individual-student intervention.

7.2 Assessment of efficient achievement of goals

Efficiency of implementation relates to the achievement of program goals in time- and cost-effective ways. Measuring efficiency is complex, and often relies on the opinions of participants as to the relative worth of the outcomes, compared with the costs. In general the outcomes of *QuickSmart* were judged to be worth the investment made by schools.

QuickSmart is implemented as an individual-student intervention program, with the goal of improving students' ability to easily and quickly recall number facts and perform basic computation. This is referred to as 'automaticity'. Both teachers and tutors indicated that the *QuickSmart* program clearly achieved its goal. One principal clearly articulated that *QuickSmart*:

"...basically doesn't pretend to be anything more than it is - getting kids to do things quickly and accurately and that's all it's asking the kids to do."

Withdrawing students from class, to work directly in pairs with a tutor, was reported to be most effective in maximising learning support and producing impressive results for individuals. School principals and *QuickSmart* coordinators put considerable time into employing effective tutors. This and other aspects of management of the program were seen to be time-consuming, but essential to the smooth running of the intervention.

Efficient organisation and management of the program relied on the ability of the school to enlist an effective coordinator. Support from the *QuickSmart* team and working well with teachers also assists the coordinator to make the program work efficiently.

Cost-effectiveness of the program is equally difficult to determine simply. All principals acknowledged the expense of the program, but equally highlighted the benefits gained by students. In seeking ways to operate the program more economically, a number of alternative strategies were suggested, such as:

- in-house training, provided by the coordinator or other trained teacher
- using volunteers or existing support staff as tutors
- implementing the *QuickSmart* strategies as class-based numeracy activities only.

For each option, the disadvantages were judged to outweigh the potential cost saving, which called into question the effectiveness of the suggested strategy.

In response to questions of cost-effectiveness, principals were consistent, suggesting that it's *"hard to put a price on [this sort of] student success"*, or that no matter the cost, the results produced through *QuickSmart* were worth the expense.

7.3 Addressing the mandatory reform elements of the NPLN

The NPLN comprised the three professional learning elements:

- focussed literacy interventions for whole-class groups and individual students
- teacher leadership development
- effective use of student performance information.

The evidence from this evaluation suggests that implementation of *QuickSmart* has contributed to schools' progress towards addressing the reform agendas of the NPLN.

7.3.1 Effective and evidence-based teaching of numeracy

A major feature of *QuickSmart* is the CAAS assessment used to monitor student progress throughout the course of the program.

Tutors, in particular, had confidence in the quality of the CAAS assessment activities. Teachers also saw them as providing useful diagnostic data, and used them as the major input to development of individualised programs for participating students.

There was some suggestion across the schools visited as part of the evaluation, that teacher awareness of how student progress was being tracked had grown. This aspect would be further developed if, in the future, *QuickSmart* strategies become part of class-based activity.

7.3.2 Strong school leadership and whole-school engagement with numeracy

All participants reported that strong school leadership was a feature of the implementation of *QuickSmart* in their schools. Without exception, survey respondents indicated that school leaders both provided resources and personal support for the intervention, and promoted improved numeracy practices throughout the school.

The coordinator role was often taken on by a class teacher, as a leadership development strategy.

Almost no mention was made, however, of other strategies to build leadership capacity, or the use of the *Analytical Framework for School Improvement* (PLLDD, 2010). It may be that these were more relevant to the schools' implementation of the whole-class intervention, which directly affected a larger percentage of teachers.

QuickSmart had a limited effect on the school community as a whole. Knowledge of the program was strongest amongst teachers who had class members involved. Parents whose children were involved, had equally strong interest in the operation and future implementation of the program.

7.3.3 Monitoring student and school numeracy performance

The selection of students to take part in *QuickSmart* was based predominantly on a student's assessment results, both NAPLAN and school-based results. Once established in the program, student progress was based on the *QuickSmart* CAAS assessments embedded in each set of activities.

There is little evidence of teacher or tutor involvement in analysis of performance data from other sources. No mention was made of teacher engagement with *Data Analysis and Skills Assessment* (DASA).

Teacher capacity to analyse SMART data was not mentioned as a priority in the *QuickSmart* program implementation. This is understandable as the progress of the majority of students, those in Years 5 and 6, would not be evident through external testing.

7.4 Improving educational outcomes of Aboriginal students

Approximately 55% of schools implementing *QuickSmart* had Aboriginal students enrolled at the school.

The evaluation of *QuickSmart* focussed on student achievement in numeracy. Most participants reported improved numeracy outcomes for all Aboriginal students, as a result of their participation in *QuickSmart*. In gauging improvements in other educational outcomes for Aboriginal students, the evaluation has relied on responses to the teacher survey and interviews with parents, teachers and students themselves.

Staff in schools with Aboriginal students reported improvements in both academic and social outcomes, including improved attendance, increased participation in class activities, as well as increased self-esteem, confidence and improved behaviour. Teachers and tutors clearly attributed these improvements to the one-on-one interactions and relationships built with tutors and peers during *QuickSmart* sessions.

Parents in particular, recounted a variety of numeracy-related behaviours which they found to be quite entertaining. Improvement in willingness to do homework was noted, and parents commented that their children were more generally engaged in school.

7.5 Supporting schools to participate in the evaluation

Qualitative data was gathered from four schools. The evaluation team worked with each school to:

- minimise disruption to school routines
- provide schedules of interviews and parent consent forms well ahead of time
- provide funds for catering for personnel involved in the evaluation process.

Schools who took part in the evaluation saw it as a valuable opportunity to reflect on their practice, both individually and collectively. Teachers in particular appreciated the chance to provide feedback on their experiences with *QuickSmart*, and as part of the NPLN in general.

Many principals, numeracy team leaders and teachers indicated that questions asked by evaluation officers assisted their own assessment of the effectiveness and efficiency of implementing the numeracy initiative.

7.6 Support for reforms to be incorporated into school practice

The evaluation findings set out the factors contributing to the success of *QuickSmart*, and the issues that have arisen that may hamper its continued implementation.

7.6.1 Success factors

A number of factors were identified as contributing to the program's overall success. These included:

- selecting and retaining the right tutors
- building strong relationships: between the school and the tutors, between teachers and tutors; and between tutors and their students
- regular monitoring of student progress using school-based assessments, *QuickSmart* CAAS assessments and, to a lesser extent SMART data
- quality training, promoting teacher and tutor confidence in implementing *QuickSmart*
- establishing a *QuickSmart* coordinator to provide dedicated program support to tutors, students, class teachers, and parents.

7.6.2 Challenges encountered in implementing *QuickSmart*

Teachers and school leaders highlighted both real and potential challenges that occurred throughout the period of NPLN implementation:

- high turnover of teaching staff, resulting in regular need for training if required
- cost of training, including travel, accommodation and teacher relief expenses
- complexity of timetabling *QuickSmart* sessions, to ensure continuity for students, without encroaching on too many other class demands. Timetabling was definitely perceived as the greatest weakness of the program
- identification of ongoing funding support to employ the tutors who are *"the heart and backbone"* of the program.

Unfortunately teachers at one school found that when a new 'untrained' principal started at the school, the program was cancelled because the principal was unaware of how it operated and its value in the school.

One school principal had a serious grievance with the whole NPLN implementation in his school. He expressed particular frustration around issues such as:

- limited choice of numeracy programs offered for implementation
- the short time frame for selection of the program, and the *"speed of our obligation to get things happening"*
- the short time frame to make judgements about expenditure of *"hundreds of thousands of dollars"* without access to school staff, or people to provide authoritative advice
- the expectation that the program would run on a financial year basis rather than a calendar or school year; and most vehemently of all
- the limited period of supported implementation.

Despite his expressed annoyance with the overall program, the principal was supportive of his teachers and tutors and appreciative of the outcomes achieved.

7.7 Sustainability

While *QuickSmart* is labour-intensive and complex to organise, its results are impressive. This, and the potential to expand practices beyond the student-withdrawal program, made it an attractive proposition for the NPLN schools to maintain beyond the period of funding.

Four factors are identified as being critical to the sustainability of *QuickSmart* in schools:

- securing a funding source for ongoing employment of tutors
- supporting the *QuickSmart* coordinator with relief time, to complete the complex management tasks
- providing additional resource kits
- ensuring a strategy for ongoing training for new teachers or tutors.

Most school communities and individual staff members were firm in their intention to retain the *QuickSmart* individual-student intervention program for as many students as needed it. They were equally eager to extend the use of *QuickSmart* strategies throughout the school, as appropriate, in class-based numeracy learning for all students.

Glossary

TERM	DESCRIPTION
Activity	Direct experience in program exercise
AECG	Aboriginal Education Consultative Group Inc. (NSW)
AEO	Aboriginal Education Officer
AL	Accelerated Literacy
Assessment	Method of evaluating student performance
Benchmark	Standard against which performance is measured
Best practice	Judgement of a particular practice against a stated benchmark
CAAS	Cognitive Aptitude Assessment Systems
COAG	Council of Australian Governments
DASA	Data Analysis and Skills Assessment
DEC	NSW Department of Education and Communities (prior to 3 April 2011, the agency was known as Department of Education and Training)
Effective	Producing a desired result
Efficient	Well organised; achieving result with minimal resources, time and effort
EMSAD	Educational Measurement and School Accountability Directorate
Goals	Specific targets to achieve a defined objective
IM	DEC code applied to classes catering for students with mild intellectual disability
Literacy	Ability to read and write to defined levels
NAPLAN	National Assessment Program Literacy and Numeracy
NPLN	National Partnership on Literacy and Numeracy
NP Low SES	National Partnership for Low SES Schools
Numeracy	Mathematical skills needed to cope with everyday life
PERG	Program Evaluation Reference Group
PLP	Personalised Learning Plan (for Aboriginal students)
SES	Socio-economic status
SiMERR	National Centre of Science, Information and Communication Technology and Mathematics Education for Rural and Regional Australia, located at the University of New England
SLSO	School Learning Support Officer
SMART	School Measurement, Assessment and Reporting Toolkit
STLA	Support Teacher: Learning Assistance
Strategies	Actions to achieve a goal in a particular program
Teaching sequence	Units contained within a specific program working together to achieve overall effect
ToR	Terms of Reference
UNE	University of New England

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Appendix 1 - Evaluation instruments



Education &
Communities

National Partnership on Literacy and Numeracy Evaluation

Student Engagement and Program Evaluation Bureau

Principal Interview

SCHOOL: _____ REGION: _____

PRINCIPAL: _____

Introduction:

- Reiterate purpose of evaluation:
 - Assess the effectiveness of the program
 - Assess the extent to which the program achieves its goals in an efficient manner
- Confirm procedure for day
 - Principal Interview
 - Class observation
 - Student focus group
 - Teacher interview
 - Parent/community focus group

Discussion point	
1	Does the school have a whole-school numeracy policy? How effective is this policy in improving students' numeracy skills?
2	Why did the school select this numeracy intervention strategy? Does the school also use other intervention strategies? What are they?
3	What means does the school use to identify students who need support to improve their numeracy skills?
4	How does the school manage the administration of this intervention? Space; availability of instructors; number of sessions and number of students? What hinders? What helps?
5	What role does the school executive have in leading the numeracy programs in the school? Is there a dedicated team leader for <i>QuickSmart</i> in the school? Have you had adequate support from the Regional National Partnership Program Facilitator in implementing your numeracy strategies including <i>QuickSmart</i> ?
6	Do teachers and or SLSOs./AEOs / instructors deliver the program? How are they selected? Do they receive appropriate training?
7	Do teachers and or SLSOs/AEOs/instructors have the necessary resources always available to them, sufficient support to analyse students' progress and opportunities to share this analysis with other staff?
8	How is the progress of students in this numeracy intervention program communicated to the class teacher or numeracy coordinator?

Discussion point	
9	Are teachers aware of the teaching and learning strategies and the resources used in this numeracy intervention program? Do they use similar strategies and resources in mathematics lessons?
10	Does the school provide parents with opportunities to develop their own numeracy skills or to become familiar with the numeracy teaching strategies in the school?
11	Do all staff view themselves as teachers of numeracy?
12	Do numeracy co-ordinators work with other teachers to: plan opportunities for students to apply and improve their developing skills in numeracy in subjects across the curriculum, where appropriate; agree on common teaching and learning strategies for numeracy; and adjust mathematics scope and sequences to make sure students learn the necessary skills in numeracy before they need them in other subject areas?
13	Do all staff have sufficiently high expectations for students' numeracy skills?
14	Do all staff understand the numeracy skills development that can be expected from individual students in the <i>QuickSmart</i> Program?
15	Do staff understand how best to support those with low numeracy skills? Are they accepting of the <i>QuickSmart</i> Program as a useful intervention?
16	Does the school have a well-planned program to review and evaluate the impact of numeracy initiatives and are the findings used to plan further improvement? Are learners' views sought on numeracy as part of this review? Are parents' views sought on numeracy as part of this review?
17	Does the <i>QuickSmart</i> program provide a good range of guidance and exemplar materials for teaching and assessing numeracy?
18	Do you believe <i>QuickSmart</i> is a cost-effective intervention program? Will you be able to continue using it without NPLN funding?
19	What are your plans for 2012 beyond for numeracy programs in your school?
20	What substitute might you use if you can no longer afford the current intervention?

Thank principal for their time



National Partnership on Literacy and Numeracy Evaluation

Student Engagement and Program Evaluation Bureau

Teacher Group Interview

SCHOOL: _____ REGION: _____

TEACHERS: _____

no of teachers present

Introduction:

- Reiterate purpose of evaluation:
 - Assess the effectiveness of the program
 - Assess the extent to which the program achieves its goals in an efficient manner
- Reiterate this discussion is to add to feedback from the online teacher survey

Discussion point	
1	How did you select the students to be involved in the <i>QuickSmart</i> Intervention Program? How many students are involved from your class? Are the students withdrawn from class? Individually or with a partner?
2	Were the students' parents informed of their child's involvement? How were they informed? What was their reaction?
3	Who teaches the students when they are withdrawn? How were these instructors selected? What training have the instructors had?
4	If you do not teach the Program describe the working relationship you have with the instructor.
5	In your opinion has <i>QuickSmart</i> been an effective intervention for the particular students selected? Has there been a difference in student performance overall? Has there been an impact on increasing their numeracy skill level? Are students able to apply skills learnt to other class work? Has there been an impact on other areas of learning? Please describe.
6	What effect has your engagement with this intervention had on the way you design learning experiences in numeracy for your class? How do students who have been withdrawn catch up on work they miss? Is the class climate the same when the students are in the class as when they are withdrawn?
8	To your knowledge is <i>QuickSmart</i> related specifically to (Aboriginal) student background and learning experience? Is the Aboriginal community involved (if student is Aboriginal)?
9	To what extent have you been supported by others in the development and implementation of the program?
10	What professional development have you undertaken in relation to gaining knowledge about this particular type of intervention?
11	Are you planning to continue implementing <i>QuickSmart</i> after 2011?
12	What challenges did you find in implementing the intervention? (e.g. resources, space, time, tutor availability, disagreements on targets) Was there a need to make changes to school organisation to incorporate the program requirements?

Thank principal for their time

National Partnership on Literacy and Numeracy Evaluation

Student Engagement and Program Evaluation Bureau

NPLN Observation Data (Individual intervention)

The purpose of the 30 mins classroom observation is:

- To provide confirmation of data collected through survey/interview responses regarding student engagement and teacher practice
- To provide a contextual relationship with the students in the program prior to student focus group session.

Program		Region	
School		Year observed	
Lesson Activity		Total number of students in lesson	
		Number of Aboriginal students in lesson	
Program Facilitator		Reasons for withdrawal.	
SSLO			
AEO			
Other tutor/s			
General observations and comments regarding: - Program effectiveness (e.g. student focus and engagement) - Program embedded in class culture (e.g. evidence of student timetable/routines, work/numeracy promotion in class environment)			



National Partnership on Literacy and Numeracy Evaluation

Student Engagement and Program Evaluation Bureau

Student Focus Group*

*4-6 students present during lesson observation

SCHOOL: _____ REGION: _____

Year Level: _____ Number: _____

Boys: _____ Girls: _____

Aboriginal: _____

Introduction:

- Thank students for being there.
- Introduce evaluation officers.
- Remind students why you are meeting with them (to see how well *QuickSmart* is helping them with their numeracy learning).
- Bring up event in observation session where you were impressed with their learning (e.g. "When you were able to....., that was very impressive").

This should be a general discussion regarding numeracy and *QuickSmart* and the impact upon the students present. Whilst there are specific questions that may need answering, the evaluation officers should guide the discussion around the main headings. Allow the students to talk freely about school, maths, numeracy.

Discussion points	
SA	Engagement
SA1	What is the first thing you think about when I say the word "Numeracy"?
SA 3a	Tell us what you think about your <i>QuickSmart</i> lessons.
SA 3b	Are there things you like about your <i>QuickSmart</i> lessons?
SA 3c	Are there things you don't like about your <i>QuickSmart</i> lessons? <i>PROMPT: being withdrawn from class</i>
SB	Skill development
SB1a	Do you think you've improved in numeracy? <i>PROMPT: In what ways? How do you feel? What's different?</i>
SB1c	Have you done any numeracy assessments? Have you improved your maths skills according to these tests?
SC	Other benefits
SC1	Think about all the subjects you do at school. How do you think your <i>QuickSmart</i> helps you with these?
SC2	Anything else you would like to say about your <i>QuickSmart</i> lessons or numeracy?

Thank participants for their time.

Note: May be positive for students if evaluators provide a small snack (check for allergies with teacher), or small item to reward students for engaging in focus group (check class/school reward system).



National Partnership on Literacy and Numeracy Evaluation

Student Engagement and Program Evaluation Bureau

Parent/Community Focus Group

SCHOOL: _____ REGION: _____

PARENTS: _____ COMMUNITY: _____

no of parents in group

no of other community members in group

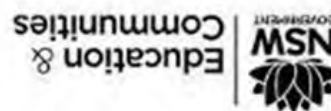
Introduction:

- Introduce evaluation officers
- Ensure they have coffee/tea etc if they want and feel comfortable
- Quick overview of the purpose of the National Partnership on Literacy and Numeracy and the evaluation of *QuickSmart*
- Ask how many have children at school, how many are members of community without students at the school (quick count).

This should be a general discussion regarding numeracy and *QuickSmart* and the impact upon the children of those present. Whilst there are specific questions that may need answering, the evaluation officers should guide the discussion around the main headings.

Discussion point	
1	Were you consulted about your child's involvement in the <i>QuickSmart</i> Intervention Program?
2	How were you informed? Did you understand clearly what your child would be doing in the <i>QuickSmart</i> Program?
3	Were you given any information about how you would be able to support your child in this program?
4	Did you have any questions or concerns about the program? Were these answered to your satisfaction?
5	How do you think <i>QuickSmart</i> is working for your child? What difference has it made?
8	How much time do you spend working with your child or talking to your child about the program?
9	Can you suggest any improvements regarding the way <i>QuickSmart</i> is used in the school?

My name is:



When we discuss we:

Join in

Listen to others

Respect everyone's opinion



Appendix 2 - Online teacher and tutor survey responses

QuickSmart teacher and tutor survey results

Including comments on item responses

Note: the sample size of 17 is small and this limits the strength of the generalisations which can be made from the survey responses

Qualifications and experience

Q1 Qualified Teacher

Qualified teacher	71%
Not a qualified teacher	29%

Key points: Four of the seventeen respondents are qualified teachers and the remaining thirteen are not.

Q2 Teaching Qualifications

Bachelor degree	29%
Diploma in Education	29%
Special Education (degree or diploma)	18%
Masters	0
PhD	0
None of the above	29%

Key points: Five respondents have a Bachelor degree, five respondents have a Diploma in Education, three have a degree or diploma in special education (including one with a diploma also) and five have none of the listed qualifications.

Q3 Current role in the school

Class teacher	18%
School Learning Support Officer	29%
Aboriginal Education Officer	0
School volunteer	0
Other	53%

Key points: Some respondents are teachers or school learning support officers. Others are assistant principals, combined STLA and SLSO or other roles. There were no Aboriginal education officers or school volunteers in the sample.

Q4 Career experience in schools

Less than a year	0%
1 to <3 years	24%
3 to <5 years	12%
5 to <10 years	6%
10 or more years	59%

Key points: Eleven respondents have at least 5 years experience, while six have less than five years.

Q5 Time at the school

Less than a year	0%
1 to <3 years	35%
3 to <5 years	6%
5 to <10 years	6%
10 or more years	53%

Key points: Eleven respondents have worked at least three years at the school, while six have worked less than three years.

Involvement in the *QuickSmart* program

Q6 *QuickSmart* teaching experience

Less than a year	18%
1 to <3 years	65%
3 to <5 years	18%
5 to <10 years	0%
10 or more years	0%

Key points: Fifteen respondents were in their first or second year of teaching *QuickSmart*, while three had been involved for three years or more.

Q7 Have you participated in Cultural Immersion training?

Yes	24%
No	76%
Don't know	0%

Key points: One quarter of respondents have had Cultural Immersion training

Q8 *QuickSmart* formal professional development programs/s (tick one or more)

QS professional learning workshops	76%
School based QS PD	18%
Neither of the above	12%

Key points: All except two respondents have had specific *QuickSmart* training. Thirteen respondents were trained in the *QuickSmart* workshops while three have had school based professional learning and two had neither of those forms of professional learning.

Q9 Have you participated in any other numeracy professional development over the past 2 years?

Eleven respondents (65%) had participated in other numeracy training; nine of these had completed the *TOWN* training.

Understanding of the *QuickSmart* program

Q10 I understand the principles of *QuickSmart*

Extremely well	47%
Very well	47%
Somewhat	6%
Not at all	0

Key Points: Almost all respondents said they understand very well or extremely well.

Q11 I understand the purpose of *QuickSmart*

Extremely well	47%
Very well	53%
Somewhat	0
Not at all	0

Key points: All respondents stated that the purpose of *QuickSmart* is very well or extremely well understood.

Q12 I can implement individually designed intervention programs

Extremely well	47%
Very well	24%
Somewhat	18%
Not at all	12%

Key points: Two out of three respondents said they implement individually designed intervention programs very well or extremely well.

Q14 QuickSmart website

Frequently	12%
More than once	47%
Once	29%
Never	12%

Key points: Ten respondents said they have accessed the *QuickSmart* website more than once or frequently. Two respondents have never used the website.

Implementation of the *QuickSmart* Program

Q15 When you implemented *QuickSmart* in 2009, in which year/s were the students you taught at that time?
(tick one or more)

Kindergarten	0%
Year 1	0%
Year 2	6%
Year 3	6%
Year 4	47%
Year 5	71%
Year 6	65%
Not applicable	6%

Key points: *QuickSmart* was implemented in 2009 by almost all respondents, mostly in Years 4 to 6.

Q16 When you implemented *QuickSmart* in 2010, in which year/s were the students you taught at that time?
(tick one or more)

Kindergarten	0%
Year 1	0%
Year 2	0%
Year 3	6%
Year 4	76%
Year 5	82%
Year 6	65%
Not applicable	6%

Key points: Almost all respondents implemented *QuickSmart* in 2010. It was implemented mostly in Years 4 to 6.

Q17 When you implemented QuickSmart in 2011, in which year/s were the students you taught at that time? (tick one or more)

Kindergarten	0%
Year 1	0%
Year 2	0%
Year 3	6%
Year 4	65%
Year 5	71%
Year 6	65%
Not applicable	12%

Key points: Most respondents implemented QuickSmart in 2011. It was implemented mostly in Years 4 to 6.

Opinion of the support materials and services provided

Q18 The QuickSmart professional learning workshops were useful.

Strongly Agree	41%
Agree	53%
Disagree	6%
Strongly Disagree	0

Key points: Almost all respondents said the QuickSmart workshops were useful.

Q19 I utilise the suggested QuickSmart kit of resources.

Always	65%
Frequently	12%
Sometimes	6%
Never	18%

Key points: All except three respondents said they utilised the suggested classroom resources and 12 said they used them frequently or always.

Q20 I plan units of work with other QuickSmart teachers/instructors in the school

Always	24%
Frequently	18%
Sometimes	18%
Never	41%

Key points: Most respondents plan units of work with other QuickSmart teachers, while four never plan this way.

Q21 I feel supported by the school QuickSmart teacher coordinator

Always	59%
Frequently	18%
Sometimes	12%
Never	0%
Not applicable (There is no QuickSmart teacher coordinator)	12%

Key points: All except two respondents said they had a teacher coordinator. Most respondents said they are at least sometimes supported by the QuickSmart teacher coordinator, while just over half said they are always supported. None said they are never supported.

Q22 The approximate length of time I spend teaching QuickSmart each day is

30 minutes or less	35%
45 minutes	18%
60 minutes	6%
90 minutes	0%
more than 90 mins	41%

Key points: Ten respondents teach *QuickSmart* for up to an hour each day. Seven teach more than 90 minutes.

Impact of the *QuickSmart* program

Q23 *QuickSmart* has improved numeracy outcomes for

All the students engaged in the program in my class	47%
Most of the students engaged in the program in my class	47%
Some of the students engaged in the program in my class	6%
None of the students engaged in the program in my class	0

Key points: Almost all respondents said *QuickSmart* has improved numeracy outcomes for most or all students engaged in the program.

Q24 *QuickSmart* has improved numeracy outcomes for

All of the Aboriginal students engaged in the program in my class	47%
Most of the Aboriginal students engaged in the program in my class	0
Some of the Aboriginal students engaged in the program in my class	6%
None of the Aboriginal students engaged in the program in my class	0
Not applicable	47%

Key points: Half of the respondents with Aboriginal students engaged in the program in their class said *QuickSmart* has improved numeracy outcomes for all Aboriginal students engaged in the program. Two respondents with Aboriginal students engaged in the program in their class said some Aboriginal students have improved. None said no Aboriginal students improved.

Q25 *QuickSmart* has increased student engagement with numeracy

All the students engaged in the program in my class	47%
Most of the students engaged in the program in my class	41%
Some of the students engaged in the program in my class	12%
None of the students engaged in the program in my class	0

Key points: Fifteen respondents said *QuickSmart* has increased engagement with numeracy for most or all students. Two said some have improved while no respondents said no students improved.

Q26 *QuickSmart* has improved the way I teach numeracy in my class

Strongly Agree	24%
Agree	59%
Disagree	12%
Strongly Disagree	6%

Key points: Fourteen respondents said that *QuickSmart* has improved the way they teach numeracy in their class, while three disagreed.

Q27 *QuickSmart assessments provide evidence of where support is needed*

Strongly Agree	59%
Agree	35%
Disagree	0
Strongly Disagree	6%

Key points: Almost all respondents said that *QuickSmart* assessments provide evidence of where support is needed.

Q28 *The QuickSmart assessment activities are useful in identifying students' numeracy needs*

Strongly Agree	53%
Agree	41%
Disagree	0
Strongly Disagree	6%

Key points: Almost all respondents said that *QuickSmart* assessment activities are useful in identifying students' numeracy needs.

Q29 *The teaching goals and activities chosen are related specifically to students' backgrounds and learning needs*

Strongly Agree	41%
Agree	41%
Disagree	12%
Strongly Disagree	6%

Key points: Fourteen respondents said goals and activities chosen are related specifically to students' background and learning needs, while three disagreed.

Help received from the support services and resources provided by the *QuickSmart* program

Q30 *Other school community personnel have participated in QuickSmart professional learning workshops*

Yes	71%
No	29%

Key points: Twelve respondents said that other school community personnel participated in *QuickSmart* professional learning workshops, while five said they did not.

Q31 *A teacher coordinator plays an active role in QuickSmart*

Always	76%
Frequently	18%
Sometimes	6%
Never	0
Not applicable (i.e. no teacher coordinator)	0

Key points: All of the respondents had a teacher coordinator. Almost all of those respondents who had a teacher coordinator said the coordinator always or frequently played an active role. Two said the coordinator played an active role only sometimes.

Q32 *The Aboriginal Education Officer plays an active role in QuickSmart*

Always	6%
Frequently	0
Sometimes	12%
Never	35%
Not applicable (i.e. no AEO in school)	47%

Key points: Half of the respondents did not have an AEO in their school. Of those who did, almost all said the AEO never or only sometimes played an important role in *QuickSmart*.

Q33 Community volunteers play an active role in QuickSmart

Always	0
Frequently	0
Sometimes	12%
Never	35%
Not applicable (i.e. no community volunteers)	53%

Key points: Half of the respondents did not have community volunteers in their school. All of those who did said the community volunteers never or only sometimes played an active role in *QuickSmart*.

Q34 Community volunteers in my school have the experience, skills and knowledge to support students in QuickSmart

Strongly Agree	29%
Agree	59%
Disagree	6%
Strongly Disagree	6%

Key points: Fifteen respondents said community volunteers are able to support students in *QuickSmart* while two disagreed.

Q35 QuickSmart intensive strategies have decreased the need to withdraw students for individualised intervention

Strongly Agree	12%
Agree	65%
Disagree	18%
Strongly Disagree	6%

Key points: Thirteen respondents said *QuickSmart* intensive strategies have decreased the need to withdraw students for individualised intervention, while four disagreed.

Participation of the school in numeracy programs

Q36 The school principal promotes numeracy across the school

Strongly Agree	71%
Agree	24%
Disagree	0
Strongly Disagree	6%

Key points: Almost all respondents said the school principal promotes numeracy across the school.

Q37 School staff is supported to develop numeracy knowledge and skills

Strongly Agree	65%
Agree	35%
Disagree	0
Strongly Disagree	0

Key points: All respondents said the school staff is supported to develop numeracy knowledge and skills.

Q38 The school executive shows an active interest in student numeracy outcomes

Strongly Agree	76%
Agree	24%
Disagree	0
Strongly Disagree	0

Key points: All respondents said the school executive shows an active interest in student numeracy outcomes.

Q39 School leaders ensure human resources are available

Strongly Agree	53%
Agree	41%
Disagree	6%
Strongly Disagree	0%

Key points: Almost all respondents said school leaders ensure human resources are available.

Q40 School leaders ensure material resources are available

Strongly Agree	59%
Agree	41%
Disagree	0
Strongly Disagree	0

Key points: All respondents said school leaders ensure material resources are available.

Q41 A culture of continuous improvement in numeracy outcomes is promoted and supported

Strongly Agree	65%
Agree	35%
Disagree	0
Strongly Disagree	0

Key points: All respondents said a culture of continuous improvement in numeracy outcomes is promoted and supported in the school

Q42 QuickSmart has encouraged parent/caregiver engagement in numeracy

Strongly Agree	35%
Agree	53%
Disagree	12%
Strongly Disagree	0

Key points: Fifteen respondents said QuickSmart has encouraged parent/caregiver engagement in numeracy, while two disagreed.

Q43 I would recommend QuickSmart to a colleague

Strongly Agree	82%
Agree	18%
Disagree	0
Strongly Disagree	0

Key points: All respondents would recommend QuickSmart to a colleague.

Q44 My involvement in QuickSmart has led me to conclude that the program overall is

Extremely effective	47%
Very effective	41%
Somewhat effective	12%
Not effective	0

Key points: Fifteen of the respondents said the program overall is effective or extremely effective, while two said it is somewhat effective.

Q45 Comment on the strengths and weaknesses of QuickSmart in relation to improving students' numeracy skills, and any implementation challenges.

Number of open responses: 17

Q46 Comment on the extent to which QuickSmart is sustainable in your school. You can include comments on your willingness and capacity to implement QuickSmart in your classroom without the present funding level of professional development and support.

Number of open responses: 17

Note: Free text answers have been included in the analysis of the evaluation interviews and focus groups.

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