

**The National Centre of Science, Information and  
Communication Technology, and Mathematics  
Education for Rural and Regional Australia**



**Full Report  
*QuickSmart* Intervention  
Research Program:  
Using Data 2001-2008**

**Report to the Department of Education,  
Employment and Workplace Relations**

**September, 2009**



This copy of the report to DEEWR has had some school names removed for publication on the web.

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Report submitted on behalf on the National Centre of Science, Information and Communication Technology, and Mathematics Education for Rural and Regional (SiMERR) Australia at the University of New England, Armidale, NSW 2351.

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## IMPORTANT QUOTES

To truly address the complexity of the literacy and numeracy problem in our schools any response needs to be comprehensive and include initiatives to address teacher quality; provide diagnostic assessment; target resources; increase the capacity and leadership of schools to intervene; help parents get involved; and provide extra support outside the classroom for struggling students. (Rudd & Smith, 2007, p.15)

Our failure to intervene and provide sufficient assistance and support to individual students, teachers and schools has meant an increasing number of students fail over time to keep up against the literacy and numeracy benchmarks. For example, six per cent of Year 3 students did not meet numeracy benchmarks in 2001. By 2003 ten per cent of the total student cohort did not meet the Year 5 benchmarks for numeracy and in 2005, 18 per cent failed to meet the benchmarks in Year 7. (Rudd & Smith, 2007, pp.4-5)

As compelling as the case for early intervention can be, if the case is made at the expense of addressing the equally problematic and unique set of problems presented by older-age individuals, the long term effects of putting 'all our field's eggs into the early identification and intervention basket' will be devastating for thousands of individuals with LD. (Deschler, 2005, p.122)

My experiences in viewing *QuickSmart* in action in the schools in New England are all positive. I have found many students, who were previously disengaged with mathematical activities, totally engaged in the activities and process that form a major part of the intervention... Independent research in the New England region indicated that students, including Aboriginal students, make quick gains in their ability and confidence to use mathematics. (Mr Des Gorman A/General Manager, Learning and Development, NSW DET)

Improvements in student achievement results through the *QuickSmart* program have continued to be outstanding throughout the five-year expansion including the clear improvement in Year 5 and Year 7 numeracy results in the inaugural 2008 National Assessment Program Literacy and Numeracy (NAPLAN) tests. Of particular note, the numeracy results for the NT exceeded literacy results at these year levels for the first time in history. The connections to the *QuickSmart* program are both valid and strong as a major contributing factor for these improved results. The improvements noted above have been realised despite increasing numbers of students with even lower levels of numeracy entering the program and continuing to improve at the same rate as previous cohorts. (Ms Debbie Efthymiades, General Manager, Strategic Executive Services, NT DET)

## ACKNOWLEDGEMENTS

Many people have contributed to the preparation of this report and require our deepest thanks. Firstly, we recognise Ms Eve Croeser who has taken on the large burden of collecting the data from schools and entering it accurately into a useable database. She also coordinated the main writing of the report and played an important role in deciding structures and Report content.

Secondly, Ms Anne Bellert, Ms Jenny Thomas and Ms Noelene Raymond, research fellows within the National Centre of Science, Information and Communication Technology, and Mathematics Education for Rural and Regional Australia (SiMERR), provided foundational ideas in the development of *QuickSmart* as well as valuable support to Eve Croeser in the preparation of this Report.

We acknowledge the work undertaken to support this Report using both quantitative and qualitative paradigms. In the case of the former, we thank Dr Peter Grimbeek, from Griffith University, Queensland, who advised on the most appropriate statistical methods to be used and undertook the data analysis of the large data sets. In the case of the qualitative data, we thank Dr Stefan Horarik who undertook the detailed analysis of the interview scripts and applied NVIVO 7 to assist with the analyses.

Part of this Report is based on independent reviews carried out by people outside the SiMERR network. In particular we thank Mr John Bradbury, Mr Geoff Gillman, Ms Joanne Jefferson, Ms Lyn Alder, Ms Sally Mackander, Mr Laurie Murphy and Professor Ross Thomas.

Mr John Bradbury, Mr Geoff Gillman, and Ms Joanne Jefferson of the Teaching, Learning and Standards Division of the Northern Territory (NT) Department of Education and Training undertook major data collection and analyses of the *QuickSmart* data for the NT schools in 2006, 2007 and 2008.

Ms Lyn Alder, working as a Support Teacher Learning Assistance (STLA) at Orara High School and later as a Curriculum Officer for the North Coast Region of New South Wales (NSW), was instrumental in providing data for Orara High School for 2005-2006, 2006-2007, and the longitudinal analysis using NSW testing and National Assessment Program Literacy and Numeracy (NAPLAN) results for 2006-2008. Ms Alder also reported upon data concerning the cluster of schools in the North Coast Region using the *QuickSmart* program during 2007 and 2008.

Ms Sally Mackander (ESL/ESD Co-ordinator) of an NT School of the Air presented findings from her study at the First International Symposium for Innovation in Rural Education (ISFIRE). The presentation provided an overview of the outcomes of the trial project involving teaching the *QuickSmart* program using distance delivery modes.

Mr Laurie Murphy and Professor A. Ross Thomas provided an independent report to the Department of Education, Employment and Workplace Relations (DEEWR) concerning the Parent School Partnerships Initiative (PSPI) Program grant involving 120 Indigenous students in the New England Region of NSW in 2008.

Importantly, we would like to acknowledge the efforts the *QuickSmart* participants. This includes all the *QuickSmart* co-ordinators and instructors, without whose

dedication we would not have the data that is so essential for evaluating the efficacy of the *QuickSmart* Numeracy and Literacy programs. We would like to thank sincerely the *QuickSmart* Coordinators and *QuickSmart* Instructors who conducted the pre-intervention and post-intervention assessments and then collected, recorded and sent in the results. We also acknowledge the principals and school executives who have supported the administrative and personnel requirements of *QuickSmart* and encouraged the acceptance of the program in their school. Also important to the success of *QuickSmart* are the regional support Supervisors who oversee the work of the school clusters. Finally, we acknowledge the students who participated in the programme. They have been able to put aside their histories of past failure and have demonstrated the courage to try again to acquire critical basic skills. In their journey of catching up to their peers in academic achievement, they have shown a new belief in their own abilities both inside and outside the classroom resulting in a “can do” feeling about potential achievements.

We also offer thanks to the Federal Government and DEEWR for the grant that enabled this extensive report to be collated and produced. It is clear that the future of viable approaches to learning, teaching and student support will rest on extensive evidence and thoroughly evaluated procedures.

Finally, we acknowledge Ms Leah Cook, senior administrative assistant to the SiMERR National Centre, for her help in preparing this report for publication.

John Pegg and Lorraine Graham (Co-developers of the *QuickSmart* program)

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# EXECUTIVE SUMMARY

## ***QuickSmart* – Narrowing the Achievement Gap**

Many tens of thousands of students in Australia struggle with Numeracy and Literacy during their middle years of schooling (ages 10 to 13 years). Current instructional activities do not appear to overcome the learning problems experienced by many of these students or lead to substantial improvements in their academic performance. In order to address this situation, the SiMERR National Centre has further developed and supported the growth of *QuickSmart*, an extensive research program aimed at narrowing the achievement gap between low-achieving students and their average-achieving peers.

Between 2001 and 2008, *QuickSmart* has improved the academic performance of more than 2,000 students from over 90 schools across sectors and State/Territory education jurisdictions. *QuickSmart* has systematically addressed the learning needs of those middle-school students who often find themselves caught up in a cycle of continued failure in Numeracy (basic mathematics) and/or Literacy (reading, vocabulary and comprehension). The *QuickSmart* Numeracy and Literacy intervention programs:

- are evidence-based, highly supported, well resourced and built around a professional learning program for Principals, supervising teachers, teachers and teacher aides;
- emphasise both practice and strategy instruction;
- are sustained quality interventions for pairs of students who actively participate in 30 minute lessons three times a week for 30 weeks; and
- narrow the achievement gap by facilitating growth of up to two or three years and sometimes more, enabling low-achieving students to proceed with their studies successfully, to maintain improvement and to learn to “Trust their heads” in the same ways that effective learners do.

*QuickSmart* is a data-rich intervention with information collected on pre- and post-measures on individual learning characteristics and Australian standardised tests (and where possible National/State Basic Skills tests), as well as stakeholder views from students, parents, teachers and school executives. Research associated with the *QuickSmart* project shows that:

- *QuickSmart* students maintain the gains from the program years after they have completed the program.
- *QuickSmart* students report a new confidence about their learning based on feedback and acknowledgement of genuine observable improvements that are obvious to peers, parents, teachers and the students themselves.
- *QuickSmart* is successful with Indigenous students, who achieve substantial and lasting benefits from the program.

- The *QuickSmart* model of professional learning provides the necessary knowledge and experiences to enable practitioners to work effectively towards improving the life chances of low-achieving students.
- *QuickSmart* is cost-effective, scalable, sustainable and efficient in addressing the learning needs of persistently low-achieving students.

## Development of the *QuickSmart* program

*QuickSmart* was developed with the support of the National Centre for Science, Information and Communication Technology, and Mathematics Education for Rural and Regional Australia (SiMERR National Centre) at the University of New England. The development of the *QuickSmart* intervention has drawn upon extensive analyses of the research literature (e.g., Swanson & Hoskyn, 1998) while its implementation has been supported by research grants from the Australian Research Council, the Federal Government, project funds from SiMERR, and extensive cash and in-kind support from the Northern Territory and New South Wales. The research program associated with *QuickSmart* is unique because it has explored a programmatic intervention conducted in a wide variety of Australian schools. Since 2001, systematic data collection and analysis has accrued substantial evidence regarding the value and applicability of the *QuickSmart* Numeracy (basic mathematics) and *QuickSmart* Literacy (reading and comprehension) programs as they have been implemented to an increasingly expansive scale.

## Research Evidence from *QuickSmart*

Independent assessment results (using state-wide or standardised tests) gathered from thousands of *QuickSmart* and comparison students provide rich data sets related to student growth that complement computer-based data collected on students' speed and accuracy on basic skills during *QuickSmart* lessons. Interviews and surveys of students, parents, teachers, and Principals have also yielded consistently positive qualitative data. This strong evidence base confirms the success of *QuickSmart* from a range of perspectives. On the basis of extensive quantitative and qualitative data, it is clear that students, both Indigenous and non-Indigenous, have made substantial academic improvement over the course of the *QuickSmart* Program. Important examples of research evidence indicate that:

- In the Northern Territory during 2006, 2007, and 2008 the effect size growth of a total of 640 *QuickSmart* students based on state-wide tests was 0.68 ( $n=162$ ), 0.60 ( $n=262$ ) and 0.78 ( $n=216$ ), respectively compared to a considerably lower effect size of approximately 0.3 or less calculated for the average-performing comparison cohorts (2006:  $n = 77$ ; 2007:  $n=136$ ; 2008:  $n=86$ ).
- In the Northern Territory, data collected over the past three years indicate that schools can expect on average a 10% improvement on standardised test results for *QuickSmart* students in the first year of implementation, which jumps to an improvement of approximately 20% in the second and subsequent years of implementation.

- Over the last five years in the Lismore Diocese, *QuickSmart* students' results on the State-wide Basic Skills Tests (BST) improved substantially. On the Numeracy assessments, 92% of students improved by at least one band with 40% of students improving by at least two bands. In the BST Reading assessments, 97.5% of *QuickSmart* students improved by at least one band with 50% of students improving by at least two bands.
- At Orara High Public School in Coffs Harbour on the North Coast of New South Wales, Year 7 students who were below Benchmark in 2005-2006 ( $n=67$ ) and in 2006-2007 ( $n=68$ ) and who subsequently participated in *QuickSmart*, were all above the National Benchmarks in Year 8.
- In 2006, 2007 and 2008, the State-wide Secondary Numeracy Assessment Program (SNAP) and English Language and Literacy Assessments (ELLA) results, as well as effect size data, identified Orara High School as one of the best performing schools in New South Wales in terms of value-added results.
- Forty-two of the 44 Orara High School students who undertook the *QuickSmart* program in 2006 were above Benchmark on the 2008 National NAPLAN test in Year 9. The two students who performed below Benchmark were diagnosed as IM students in Year 7. Each of these students, however, managed above average growth for the period from 2006 to 2008.
- Students from the eight schools which participated in *QuickSmart* in the NSW North Coast Region in 2007 recorded an effect size of 0.75 on the ACER PAT tests. In contrast, the comparison cohort's effect size value was calculated to be 0.19. The improvement of the *QuickSmart* students represents approximately three years' growth over the course of a single year. This result improved further in 2008 with an effect size of 0.801 calculated for the *QuickSmart* sample of 238 low-achieving students. Fifty-two students from this *QuickSmart* cohort were Indigenous students.
- An analysis by an independent statistician of the large data-sets of ACER PATM scores from several hundred NSW students found that the effect sizes for *QuickSmart* students ranged from 0.59 to 0.69, with the latter figure representing those students who completed the full thirty weeks of instruction.

## Conclusion

*QuickSmart* stands as one of a very few interventions, either nationally or internationally, which has been continuously evaluated across all sites and all years of its implementation. Thus, in this Report it is possible to demonstrate convincingly the successes of *QuickSmart* from 2001 to 2008. Only the collection and analysis of such an extensive database can yield the critical information, which potential adopters require as a basis for making important judgements, such as the probability that an intervention will continue to produce beneficial outcomes during further scaling-up. In the main body of this Report we have provided extensive quantitative and qualitative sets of evidence from over 2,000 students and many hundreds of teachers and parents. Both sets of results point to how *QuickSmart* helped “narrow the gap” for low-achieving middle-school students. Analysis has identified impressive statistically

significant gains in terms of probability measures and Effect Sizes that mirror the qualitative improvements reported by teachers, teacher aides and parents.

## INTRODUCTION TO REPORT

The newspaper headlines, *Funding fails to lift skills of pupils* (Ferrari, 2008), *Cash not helping 3Rs* (Australian 23/11/08) and *Money fails to help rural, Indigenous students' education* (Robbins, 2008) appeared in reaction to the NSW Auditor-General's Report, Performance Audit, *Improving Literacy and Numeracy in NSW Public Schools* released in October, 2008. The Report identified that despite an increase of over \$100 million a year based on 1996-7 funding the results in NSW have not shown improvements in students' skills.

An important reason for this lack of increase in learning outcomes for students in the bottom 30% of the cohort could be that current practices directed at improvement represent "more of the same". It appears that current instructional activities are not overcoming the learning problems experienced by many students, or leading to substantial improvements in their academic performance.

It is our contention that a different focus needs to be supported and implemented if real, sustained change is to occur. In order to address this situation, the National Centre of Science, Information and Communication Technology and Mathematics Education for Regional and Rural Australia (SiMERR) developed and supported the initial implementation of *QuickSmart*, an extensive research-based program aimed at narrowing the achievement gap between low-achieving students and their average-achieving peers.

Between 2001 and 2008, *QuickSmart* has improved the academic performance of more than 2,000 students from over 90 schools across sectors and state jurisdictions. *QuickSmart* has systematically addressed the learning needs of those students who are caught up in a cycle of continued failure in Numeracy (basic mathematics) and/or Literacy (reading, vocabulary and comprehension).

The *QuickSmart* program is an evidence-based program that is highly supported, well resourced and built around a professional learning program for Principals and school executive members (who can become school *QuickSmart* Leaders), supervising teachers (*QuickSmart* Coordinators), and teachers and teacher aides (*QuickSmart* Instructors). *QuickSmart* emphasises both practice and strategy instruction, and is a sustained quality intervention for pairs of students who actively participate in three 30-minute lessons a week for 30 weeks.

This Report presents extensive quantitative and qualitative evidence to support the effectiveness and potential for scalability and sustainability of the *QuickSmart* program. Specifically, the data sets analysed in this report indicate that:

- *QuickSmart* narrows the achievement gap by facilitating growth of two-to-three years or more. This enables low-achieving students to proceed with their studies successfully, to maintain improvement and to learn to "Trust their heads" in the same ways that effective learners do;
- *QuickSmart* students maintain the gains from the program years after they have completed the program;

- *QuickSmart* students report a new confidence about their learning based on feedback and acknowledgement of genuine observable improvements that are obvious to peers, parents, teachers and the students themselves;
- *QuickSmart* is successful with Indigenous students, who achieve substantial and lasting benefits from the program;
- The *QuickSmart* model of professional learning provides the necessary knowledge and experiences to enable practitioners to work effectively towards improving the life chances of low-achieving students;
- *QuickSmart* is a data-rich intervention with information collected on pre-intervention and post-intervention measures on individual characteristics and Australian Standardised Tests (and where possible National/State Basic Skills tests), as well as stakeholder views from students, parents, teachers and school executives; and
- *QuickSmart* is cost-effective, scalable, sustainable and efficient in addressing the learning needs of persistently low-achieving students.

This report addresses the project deliverables set to secure funding from the Department of Education, Employment and Workplace Relations (DEEWR) to support the collation and analysis of data related to the *QuickSmart* project. It is organised into nine sections, as described below:

SECTION A:	Background and Overview of the <i>QuickSmart</i> Project
SECTION B:	The <i>QuickSmart</i> Research Project
SECTION C:	Quantitative Results – General
SECTION D:	Academic Achievement of Indigenous students who participated in the <i>QuickSmart</i> Numeracy Intervention Program (2002-2008)
SECTION E:	Quantitative Results – Independent Reports
SECTION F:	Qualitative Data Analysis – Student and Parent Perspectives
SECTION G:	Qualitative Data Analysis – School Perspectives
SECTION H:	Sustainability
SECTION I:	Conclusions

Section A, *Background and Overview of the QuickSmart Project*, provides an overview of why programs such as the *QuickSmart* Numeracy and Literacy intervention programs are necessary and also provides a literature review of the theoretical underpinnings of the *QuickSmart* project. The *QuickSmart* project, which involves two aspects – the intervention programs and the research project based on the programs – is then described in detail.

Section B, *The QuickSmart Research Project*, discusses the research project's aims to further investigate the relationship between automaticity, working-memory capacity,



and learners' academic achievements. This section of the report provides an overview of the *QuickSmart* research project's design and methodology and includes descriptions of data collection procedures as well as explanations of how the data are analysed.

In Section C, *Quantitative Results – General*, the results of the quantitative data analyses are outlined and discussed. The section includes an explanation of the approach taken to analysing the quantitative data sets (results of the analysis of data collected from 2001 to 2008) from New South Wales and the Northern Territory. It concludes with a summary of the Effect Size information obtained over the course of the program.

Section D, *Academic Achievement of Indigenous students who participated in the QuickSmart Numeracy Intervention Program (2002-2008)*, reports those studies that have identifiable Indigenous student paired data. There are ten reports that meet this condition and each are summarized and discussed. Four reports are drawn from the Northern Territory, three consider groups of schools in New South Wales, and a further three draw on data from a North Coast High School in NSW.

Section E, *Quantitative Results – Independent Reports*, presents summaries of independent reports based on quantitative data sets from the Northern Territory for 2006, 2007 and 2008; North Coast High School for 2005-2008 (including results of a longitudinal study based on the Student Numeracy Assessment Program (SNAP) Scores for 2007 and the NAPLAN scores for 2008); the New South Wales North Coast Region; an NT School of the Air; and, the New South Wales New England Region as part of *The Parent School Partnerships Initiative (PSPI) Program* funded by DEEWR in 2008.

Section F, *Qualitative Data Analysis – Student and Parent Perspectives* presents the qualitative findings related to the *QuickSmart* program. Summaries of the qualitative data received from students and parents are provided in this section of the report.

Section G, *Qualitative Data Analysis – School Perspectives* presents the qualitative findings related to the *QuickSmart* program. Summaries of the qualitative data received from a variety of school stakeholders such as *QuickSmart* Instructors, Principals, Special Needs Coordinators and Teachers, including workshop participants, are provided in this section of the report.

Section H, *Sustainability*, of the report discusses the issue of sustainability by drawing upon significant ideas concerning sustainability offered by Hargeaves (2005). In this section of the report, the various ways in which the *QuickSmart* project has addressed sustainability issues to date are outlined and an overview of the potential challenges that lie ahead regarding sustainability is provided.

Section I, *Conclusions*, contains final comments, summarising main points in the report concerning how *QuickSmart* is based on extensive research and a strong evidence base provided in the previous sections of this report.

Finally, some additional information is provided. This includes: Reference List, List of Acronyms Used in Report, *QuickSmart* Staff at SiMERR National Centre, and Awards Associated with *QuickSmart*.



## SECTION A: BACKGROUND AND OVERVIEW OF THE QUICKSMART PROJECT

This section of the report begins with an overview of why interventions such as the *QuickSmart* Numeracy and Literacy programs are necessary. It then provides a literature review of the theoretical underpinnings of *QuickSmart*. The *QuickSmart* project, which involves two aspects – the intervention programs and the research project related to the programs – is then described in detail.

### Why *QuickSmart*?

To truly address the complexity of the literacy and numeracy problem in our schools any response needs to be comprehensive and include initiatives to address teacher quality; provide diagnostic assessment; target resources; increase the capacity and leadership of schools to intervene; help parents get involved; and provide extra support outside the classroom for struggling students.

(Rudd & Smith, 2007, p.15)

As compelling as the case for early intervention can be, if the case is made at the expense of addressing the equally problematic and unique set of problems presented by older-age individuals, the long term effects of putting ‘all our field’s eggs into the early identification and intervention basket’ will be devastating for thousands of individuals with LD.

(Deschler, 2005, p.122)

As a consequence of these types of comments as presented above, the *QuickSmart* intervention and research program attempts to fill some of the identified gaps in research and practice regarding middle-school (Years 5 to 8) students with persistent learning difficulties. Specifically, *QuickSmart* aims to provide an intense intervention focused on basic knowledge and understandings that can equip students with the skills necessary to engage more successfully with classroom instruction.

The *QuickSmart* intervention was designed as a relatively long-term, yet cost-effective, program for students in middle school who need to improve their basic reading, comprehension and mathematics skills. The program targets those students who have been unable to draw benefits from other in-class and withdrawal instructional activities. *QuickSmart* aims to give these students a fourth, and potentially last, phase intervention that will enable them to proceed satisfactorily with their studies for the remainder of their schooling.

National data identify a substantial systemic decline in both the number and percentage of students in remote and very remote areas achieving Numeracy Benchmarks in Year 3, Year 5 and Year 7 (Commonwealth of Australia, 2008a; Graham, Pegg, & Alder, 2007). This trend needs to be attended to as a matter of urgency, as Rudd & Smith (2007, pp.4-5) emphasise:

**Our failure to intervene and provide sufficient assistance and support to individual students, teachers and schools has meant an**

increasing number of students fail over time to keep up against the literacy and numeracy benchmarks. For example, six per cent of Year 3 students did not meet numeracy benchmarks in 2001. By 2003 ten per cent of the total student cohort did not meet the Year 5 benchmarks for numeracy and in 2005, 18 per cent failed to meet the benchmarks in Year 7.

That there is a need for intervention programs such as *QuickSmart* is indicated by the fact that students who experience ongoing failure in school face a myriad of difficulties in achieving long-term employment, and useful and fulfilling occupations (Commonwealth of Australia, 2008a). Those who exhibit consistent weaknesses in basic literacy and numeracy skills are particularly vulnerable (Commonwealth of Australia, 2008b; MCEETYA, 2007).

National test data (Ainley, Kos, & Nicholas, 2008; Commonwealth of Australia, 2008a) provide a compelling case for the need to develop programs that improve the literacy and numeracy outcomes for students who are performing at or below the National Literacy and Numeracy Benchmarks. There is a specific need for such programs to be effective for Indigenous and rural students and those with a language background other than English (Ainley, Kos, & Nicholas, 2008; Commonwealth of Australia, 2008a).

Research demonstrates that unless the underachievement of the bottom 25-30% of the student population is addressed, the ‘achievement gap’ between students who struggle with literacy and numeracy and those who achieve national benchmarks increases (Commonwealth of Australia 2008a). Stanovich (1986, cited in Graham, Pegg, & Alder, 2007, p.224), coined the phrase ‘The Matthew Effect’, that

...has become a potent way of describing the effects of learning difficulties in reading. He proposed that students’ problems with phonological processing at school entry differentially disadvantaged those with learning difficulties. Stanovich (1986) described this pattern of increasing disadvantage as a situation where ‘the rich get richer and the poor get poorer’. The middle-school years are when the Matthew Effect in reading really begins to affect students’ learning and motivation – and each passing year students who have learning difficulties fall further and further behind their peers.

It is our contention that by the time students experiencing difficulties related to literacy or numeracy reach Year 5, it is particularly difficult to bring about sustainable change within regular classroom environments. Consequently, there is a need for educational researchers to design and investigate interventions that support students who experience these difficulties.

The *National Numeracy Review Report* (Commonwealth of Australia, 2008a, p.59) outlines two recognised approaches currently used in Australian schools to address the needs of such ‘at risk’ students: “one is based on structured withdrawal programmes; and the other involves addressing students’ needs in mainstream classrooms”. Loudon et al. (2000) point out that “despite effective classroom teaching and early intervention programs, there are some children who continue to struggle with learning throughout the middle-school years and whose academic needs require focused intervention”. The *QuickSmart* project’s main aim is to address the needs of

these students who require such focused intervention, so *QuickSmart* adopts the ‘structured withdrawal programme’ approach.

The *QuickSmart* Numeracy and Literacy programs are evolutionary structured withdrawal intervention programs that have a strong impact with low-achieving students (Graham, Pegg, & Alder, 2007; Pegg, Graham, & Bellert, 2005; Cotton, 2006). The associated research (e.g., Graham & Bellert, 2005; Graham, Bellert, & Pegg, 2001; Graham, Bellert, Thomas, & Pegg, 2007; Graham, Pegg, & Alder, 2007, Pegg & Graham, 2007) in a series of projects supported by the SiMERR National Centre ensures that *QuickSmart* is one of a few programmatic interventions conducted in Australian schools with substantial empirical backing.

## **Background of the *QuickSmart* Numeracy and Literacy Project**

The *QuickSmart* Numeracy and Literacy intervention and research project was developed and expanded with the support of the SiMERR National Centre at the University of New England. The research associated with *QuickSmart* is unique because it explores a programmatic intervention conducted in a wide variety of Australian schools (primary and secondary schools located in both the public and private sectors).

Over the last eight years (2001-2008), systematic data collection and analysis has accrued substantial empirical evidence regarding the value and applicability of the *QuickSmart* Numeracy (basic mathematics) and *QuickSmart* Literacy (reading, vocabulary and comprehension) programs as they have been implemented to an increasingly expansive scale (Graham, Bellert, & Pegg, 2001; Graham, Bellert, Thomas, & Pegg, 2007; Graham, Pegg, & Alder, 2007, Pegg & Graham, 2007).

The development and monitoring of the *QuickSmart* program has been supported by a number of different funding sources over the past eight years. Initially in 2001, the Commonwealth Government funded *QuickSmart* for one year under its *Innovative Projects for Literacy and Numeracy Scheme*. The success of this initial investigation in both the schools using *QuickSmart* set the scene for the beginning of what was to become an intense programmatic theme of research.

Subsequently, the collection of maintenance data during 2002 was funded by a University of New England Research Grant for the project titled, *An analysis of long-term effects of an intervention program designed to enhance basic academic skills for middle-school low-achieving students*. In this project, the performance of twenty-two students who completed the *QuickSmart* program was followed up. It was found that these students had maintained their performance improvements for up to 24 months after they completed the intervention program (Pegg, Graham, & Bellert, 2005).

Because of the very positive results of the initial *QuickSmart* program and the data indicating its continued effectiveness, a subsequent Australian Research Council (ARC) Discovery Project Grant application by Pegg, Graham, and Royer (2003-2005) to pursue this line of research was successful. The funds allocated to the project *Enhancing basic academic skills of low-achieving students: The role of automaticity in numeracy, reading and comprehension* allowed important aspects of the program to be refined and researched in more detail. In particular, the ARC Discovery Project Grant enabled the *QuickSmart* program to be extended to more students in order to

examine the intervention programs' usefulness for students of different age ranges, as well as the importance and effectiveness of different components of the intervention approach. This research focused on two particular settings (in the Northern Territory and at a rural school in the North Coast Region of New South Wales) in addition to continuing work with four schools in the Lismore Diocese and an Independent school in the New England Region.

In the Northern Territory (NT), the 2005 *QuickSmart* numeracy intervention program was implemented in eight schools and the associated research project involved 82 students. In July 2005, funding obtained through the *Priority Schools Program* also enabled the *QuickSmart* programs to be implemented on a large scale in a disadvantaged rural school (Orara High School) in the North Coast Region of New South Wales.

Orara High School had large numbers of persistently low-achieving students (students achieving at below national benchmarks in numeracy and literacy as indicated by both NSW State-wide testing and ACER PAT standardised test results), and enrolled 67 students in the Numeracy program and 47 students in the Literacy program in 2005. These programs were implemented over a period of 18 weeks. Standardised post-test results placed Orara High School among the best in New South Wales in terms of value-added results for the Year 7-8 cohort in 2006. Cotton (2006, p.5) described Orara High School's results as constituting "a meteoric rise in student performance over a single year".

Similarly promising results were obtained from the Northern Territory, and this resulted in an extension of the *QuickSmart* project in 2006 to 11 schools. A detailed analysis of the 2006 Northern Territory school results indicated the effectiveness of the program; accordingly, the NT Department of Employment, Education, and Training conducted a more intensive program involving 20 schools and 233 students in 2007.

This growth in the number of NT schools implementing *QuickSmart* continued in 2008. In this year *QuickSmart* was expanded to include 38 schools involving over 300 students. In 2009, 64 NT schools are undertaking the *QuickSmart* Numeracy program (approximately one third of the Territory schools) and 11 schools have embarked on *QuickSmart* Literacy program.

The numbers of schools and students that have been involved in the *QuickSmart* project between 2001 and 2008 are summarised in Table A.1 below (the figures for 2008 are estimates as data for 2008 and 2009 are still forthcoming). It should be noted that the summary shown below is an underestimate of the total number of students who have participated in the *QuickSmart* program in those years: it reports the number of students who returned pre- and post-test results for at least some of the assessments used to evaluate the program. Student mobility and difficulties experienced in collecting data in some schools because of high staff turnover are factors that have affected the availability of data for analysis.

**Table A.1: Summary of Available *QuickSmart* Data for all Regions/School Sectors (2001 – 2008)**

Year	Schools	QS Students	Comparison Students	All Students (QS + Comp)	Indigenous/NESB Students
2001	2	20	13	33	N/A
2002	3	18	0	18	N/A
2003	10	63	40	103	N/A
2004	8	72	43	115	N/A
2005	13	130	141	271	N/A
2006	19	245	118	363	116
2007	55	780	269	1049	215
2008	91	772	206	978	268
TOTAL	201	2100	830	2930	599

Since its beginning with 33 students in two New England Region schools in 2001, the *QuickSmart* program has evolved over the years with the number of schools involved in the intervention and research programs growing substantially to 91 schools in 2008 and to approximately 148 schools so far in 2009. There is potential for the number of students involved in *QuickSmart* to increase dramatically if SiMERR is supported to scale the implementation of these programs.

## Theoretical underpinnings of the *QuickSmart* Project

The *QuickSmart* intervention approach is an innovative instructional method informed by research findings (for example, Baker, Gersten, & Lee, 2003; Bratina & Krudwig, 2003; Royer & Tronsky, 1998; Royer, Tronsky, & Chan, 1999). *QuickSmart* is the first, and longest-running, intervention and research project of its type undertaken in Australia.

Underpinning the *QuickSmart* intervention program is the establishment of a motivational learning environment, which emphasises fluency, automatic recall of basic facts, performance of basic skills, strategy use, and timed and strategic practice. In their discussion of the importance of automaticity in mathematical proficiency, Bratina and Krudwig (2003, p.47) cite findings from several other researchers:

...comprehension is necessary but insufficient for mathematical proficiency. Automaticity, the ability to perform a skill fluently with minimal conscious effort, is also necessary (Bloom, 1986; Schneider & Shiffrin, 1977). According to Hasselbring, Goin, and Bransford (1988), ‘the ability to succeed in higher-order skills appears to be directly related to the efficiency at which lower-order processes are executed’.

In accordance with these and similar research findings (for example, Ashbaker & Swanson, 1996; Keeler & Swanson, 2001; Mabbott & Bisanz, 2008; National Mathematics Advisory Panel, 2008; Woodward, 2006), the aim of the *QuickSmart* intervention program is to improve students’ information retrieval times to levels that free working-memory capacity from an excessive focus on mundane or routine tasks. In this way, students become better resourced to undertake higher-order mental processing and to develop age-appropriate basic reading, comprehension and



mathematics skills. There are theoretical and pragmatic reasons that support the importance of basic information retrieval to both basic mathematics and literacy skills.

It is generally accepted that the cognitive capacity of humans is limited, that is, working memory has specific constraints on the amount of information that can be processed (Anderson, 1983; Ashcraft, Donely, Halas, & Vakali, 1992; Zbrodoff & Logan, 1996). As such, there is a strong theoretical basis upon which to expect that improving the processing speed of basic skills frees up capacity, which is then available for the cognitive processing of higher-order problem-solving tasks.

Research indicates that the ability to recall information quickly is often not subject to conscious control and, subsequently, uses minimal cognitive capacity (Ashcraft, Donely, Halas, & Vakali, 1992; Borich & Tombari, 1997; Hanley, 2005; Zbrodoff & Logan, 1996). Automaticity in basic information retrieval is also of prime importance because it allows for small decreases in time to accrue in undertaking sub-tasks associated with a question, again freeing up working memory (Royer, Tronsky, & Chan, 1999). For example, poor readers at all grade levels are characterised by slower than normal development of a sight vocabulary of words they can read fluently and automatically (Torgesen & Wagner, 1998).

Similarly, in mathematics, the lack of automaticity in recalling basic number facts can result in a reduced ability to solve problems and understand mathematical concepts (Gersten & Chard, 1999). Even small decreases in the time taken to process information in working memory during basic problem-solving situations can be significant. Thus speed of information retrieval plays an important role in determining the success or otherwise of students undertaking basic mathematics tasks.

## **Practical significance of the *QuickSmart* Research Project**

The practical significance of the research project lies in the data gathered related to the effectiveness of the *QuickSmart* intervention programs. The focus of this work on the low-achieving student is an important one for schools. Also of significance is the focus on essential learning skills, such as reading and comprehension, and especially on the development of basic mathematics skills for middle-school students. As Ketterlin-Geller, Chard, and Fien (2008, p.34) point out,

...unlike the extensive knowledge base on effective instructional practices available in reading... available research on 'what works' in mathematics instruction is modest, particularly as it relates to... low-achieving students.

The importance of rigorously evaluating intervention programs must also be noted, particularly as the student population for this work is among the most vulnerable in our education system (Dobson, 2001; Ketterlin-Geller, Chard, & Fien, 2008; Reynolds, Temple, Robertson, & Mann, 2001). It is clear that educationally disadvantaged students should only participate in interventions that are educationally sound. Interventions based on unsubstantiated ideas have the potential to take up these students' valuable instruction time with little, or no maintained, gains in performance (Strain & Hoyson, 2000).

Longitudinal data that are carefully collected across settings are necessary to bring additional insights into the learning processes used by this cohort of students. The ongoing *QuickSmart* research program (discussed later in this report) with cross-sectional and longitudinal components continually informs future improvements and the evolution of the *QuickSmart* intervention program (please refer to Appendix 1 for a full list of *QuickSmart* Research Publications).

In order to contextualise the importance and effectiveness of the *QuickSmart* program, it is necessary to describe the project's overall aims and the numeracy and literacy intervention programs in some detail.

## **Pedagogical aims of the *QuickSmart* intervention programs**

As stated previously, the main underlying aim of the *QuickSmart* intervention programs is to reverse the trend of ongoing poor academic performance for students who have been struggling at school and are caught in a cycle of continued failure. These students experience significant and sustained learning difficulties and have been resistant to improvement despite attempts to overcome their learning problems. They are unable to draw benefits from other in-class and withdrawal instructional activities.

An additional, but related and equally important, aim of the *QuickSmart* program is for classroom teachers, special needs support teachers and teacher aides (referred to below by the generic term 'instructors') to learn how to work with and significantly improve the basic literacy and numeracy learning outcomes of underachieving students in the middle years of schooling. To achieve this aim, the *QuickSmart* program offers professional learning and support (as described in more detail later in this report) to enable instructors to work in a small class instructional setting with two students using a specially constructed teaching program supported by extensive material and computer-based resources.

## **Overview of the *QuickSmart* intervention programs**

At the core of the *QuickSmart* project are two intervention programs, one for numeracy and one for literacy. The intervention programs are intensive and require pairs of students to be withdrawn from the classroom and to work with an adult instructor for three 30-minute lessons each week for 30 weeks. Where possible, the pairings of students match individuals with similar learning obstacles in either numeracy or reading.

The *QuickSmart* programs follow a structured lesson sequence. An important underlying goal of each lesson is to 'structure for success' by providing students with regular and predictable learning sequences. Instructional time is made available for students to practice and improve on what they already know, and to learn and practice new knowledge.

The *QuickSmart* intervention programs are designed to:

- improve students' basic fact retrieval times, thus freeing working-memory capacity;

- foster automaticity in the performance of basic academic tasks, thus further freeing working-memory capacity;
- incorporate both time and accuracy as key dimensions of learning;
- use explicit strategy instruction that is individually tailored to students' needs;
- maximise student on-task time in structured but flexible lesson formats;
- provide extensive support materials, including a variety of learning/teaching resources;
- integrate formative assessment tasks into each lesson with a focus on individual improvement;
- use information obtained from formative assessment to provide opportunities for targeted and deliberate practice of basic skills;
- incorporate the regular use of the Cognitive Aptitude Assessment System (CAAS) software for formative assessment and as a motivating educational activity; and
- facilitate the development of meta-cognitive skills in learners, that is, the ability of learners to monitor their own learning and to set realistic learning goals for themselves.

Participants in the *QuickSmart* programs learn to develop effective strategy use and participate in targeted practice activities. Focusing on various domains in numeracy and reading, the programs enable instructors to plan instruction that meets individual students' learning needs and also provides students with opportunities to self-monitor and to receive immediate, formative feedback.

The programs in both numeracy and literacy follow a structured lesson sequence based around a 'focus set' of number facts or words. The *QuickSmart* program also emphasises the usefulness and relevance of focus number facts and focus words to regular classroom activities. This feature of the program is important for developing transfer of learning to other settings.

In relation to this point, it is also important to acknowledge that once students' recall of basic academic facts and performance of basic tasks becomes truly automatic, they cannot help but have these facts and skills available for use in other settings and on more complex tasks. It is important that middle-school students have ready access to prerequisite academic skills that enable them to engage fully with challenging academic work.

*QuickSmart* learning and teaching strategies include explicit strategy instruction, modeling, discussion, questioning, and guided and independent practice. Each lesson involves revision of work covered in the previous session, a number of guided practice activities featuring overt self talk, discussion and practice of memory and retrieval strategies, and games and worksheet activities followed by timed and independent practice activities.



Most lessons conclude with an assessment on the Cognitive Aptitude Assessment System (CAAS) to provide the student and the instructor with information about individual students' accuracy and speed of recall of basic facts. Ongoing, formative assessment is an integral part of the *QuickSmart* intervention programs and ensures that the learning programs cater to the specific needs of individual learners.

## **The use of formative assessment in the *QuickSmart* programs**

To address individual learners' needs, *QuickSmart* students are assessed at the beginning of the program and assessment results are used to develop individualised intervention programs in order to strengthen the specific basic skills (such as recall of number facts, strategy use, and basic computation skills) that students find problematic. Assessment is an important ongoing component of the *QuickSmart* learning/teaching cycle, and informs the continued development of each individual student's learning program.

In addition to specially developed paper-based learning/teaching resources and appropriate educational games provided in folders and kits (all of which are used by *QuickSmart* instructors as both instructional materials and formative assessment tools), *QuickSmart* uses a software program, the Cognitive Aptitude Assessment System (CAAS), to support learning and to obtain on-going reliable assessments of student performance. This software was developed at the Laboratory for the Assessment and Training of Academic Skills (LATAS) at the University of Massachusetts (Royer & Tronsky, 1998).

The CAAS program is installed on a laptop computer and enables precise measurements of students' accuracy and information retrieval times on literacy and numeracy tasks. Importantly, the CAAS assessment tasks are designed and sequenced in order to help identify particular obstacles that may impede student learning (Royer, 1996). The CAAS system is an important ongoing feature of the *QuickSmart* instruction and assessment cycle as it is used consistently as an instructional and assessment tool throughout the implementation of the intervention programs: as noted previously, most *QuickSmart* lessons conclude with an assessment on the CAAS system.

During these assessments, students aim to increase their accuracy and decrease their response time as a means of demonstrating increased automaticity. An appealing feature of the *QuickSmart* program is that much of the assessment information obtained during *QuickSmart* lessons is both accessible and understandable to the participating students.

*QuickSmart* students are thus able to monitor their own learning progress by receiving and recording immediate, formative feedback. The students' CAAS assessment results are automatically summarised by the software and made available in either a graph or report form that is easily interpretable by both students and teachers. Students plot assessment information obtained from the CAAS and selected other activities (such as how many flash card number facts they answer accurately or how many correct words per minute they read) onto individual graphs (please refer to Appendices 2 and 3 for sample student graph proformas).

The graphs developed by the students provide them with a motivating visual representation of their progress. Students are encouraged to use this information to set

their own realistic future learning goals. In these ways, *QuickSmart* provides struggling learners with important opportunities to take control of their own learning.

Assessment and instruction thus form a continuous cycle in the *QuickSmart* program. Instructor observations, information gained from questioning students about their strategy use, and assessment information derived from many of the activities in the program such as flashcards, repeated reading, worksheets and the oral reading of books are the basis of instructional decision-making and individualisation.

## **The *QuickSmart* Numeracy Intervention Program**

The *QuickSmart* Numeracy program focuses on improving students' recall of basic number facts and the automatic and quick performance of the four number operations (addition, subtraction, multiplication and division). Numeracy instruction occurs in half-hour sessions three times a week, and the sessions are structured to include the following short, focused activities:

- timed recall of basic number facts from a targeted set of focus number facts;
- speed sheets that also relate to the same set of basic focus facts (involving operations on numbers from 0 to 9) and include extension number facts (involving operations on numbers in the tens and hundreds);
- independent work sheets completed while students take turns on the CAAS;
- regular testing on tasks from the CAAS bank of mathematics tasks; and
- games providing opportunities to consolidate the use of strategies for calculating number facts.

The *QuickSmart* numeracy lessons begin with a review of the focus facts, starting with those already known, and move on to those yet to be remembered. Instructor-led discussion and questioning about the relationship between number facts and ways to recall them merge into simple mathematics fact practice activities (speed sheets) and games involving numbers and operations on numbers (such as *Three-in-a-Row* and *Same Sums*).

These games were developed to complement each set of focus facts and allow students to review and consolidate their learning in a motivating way. Flashcards and timed performance activities, such as speed sheets, are used to assist students to develop automatic recall.

Towards the end of the lesson, students practise their skills independently on carefully selected worksheets that are closely related to the lesson content. Numeracy lessons usually conclude with a brief CAAS assessment, which provides learners with opportunities to monitor their own progress and motivates them to improve on their own performance.

Both structured and incidental strategy instruction are thus 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. Once the program is

established, at least one lesson a week focuses on problem-solving strategies and activities.

## **The *QuickSmart* Literacy Intervention Program**

The *QuickSmart* Literacy program focuses on improving students' automaticity of word recognition and fluency in reading connected texts. Instruction is organised into units covering three-to-four weeks (i.e., 9-12 lessons) that centre on sets of focus words. Sets of around thirty focus words range in difficulty, beginning with high usage three and four letter words, to more complex and demanding sets. The sets of focus words are either linked to a curriculum learning area, a quality literary text, or a theme of interest to the students. The focus words are incorporated in two or more passages of connected text relevant to the topic.

*QuickSmart* literacy intervention sessions are structured to include a number of short and focused activities aimed at improving students' speed of word recognition, reading fluency, and comprehension skills. Each week, the three reading intervention sessions include:

- timed flashcard activities based on a set of focus words selected from a target text;
- vocabulary and word study activities;
- repeated readings of the target text to improve students' reading fluency;
- scaffolded use of comprehension strategies;
- reading games designed to consolidate students' word recognition and word meaning knowledge; and
- regular testing on selected tasks from the CAAS.

## ***QuickSmart* Numeracy and Literacy Materials**

Many of the resources required to implement the *QuickSmart* programs are provided in the *QuickSmart* Numeracy and Literacy Kits. The Kits for both programs include administrative and organisational information, learning/teaching resources, and a *QuickSmart* DVD. In addition, *QuickSmart* provides the Cognitive Aptitude Assessment System (CAAS) software for ongoing assessment throughout the duration of the *QuickSmart* programs (please refer to Appendix 4 for a concise list of the resources included in the kits).

Before the instructional program begins, each student receives a work folder, which they can personalise with drawings and stickers. This folder contains information about the program, a timetable of lessons, lists of focus words or facts, numeracy worksheets or reading passages, a 'Help' section for strategy cue cards, and an assessment and graphing section in which speed and accuracy rates, and flashcard scores or oral reading fluency data are recorded. Students leave these folders in the instructional setting so that they do not need to bring anything to *QuickSmart* lessons.

A variety of pens, pencils, highlighters, and writing materials are generally provided for students to use during lessons. Individualisation of the program to meet learners'

needs involves selecting relevant sets of flashcards, worksheets and games before the intervention for use in regular practice activities.

## **QuickSmart Professional Learning Opportunities**

An integral part of the *QuickSmart* Numeracy program is the professional learning opportunities it provides to teaching and support staff, numeracy co-ordinators and educational leaders. In essence, *QuickSmart* uses a nested model of implementation Resnick (2009) that sets up:

- groups within a school working at the student level;
- groups of schools within a cluster working at teacher learning levels;
- clusters of schools within a region working at the policy level while also ensuring the fidelity of implementation; and finally,
- regions of schools within a state working to support and evaluate the program.

School communities' involvement in professional learning experiences are dependant on a number of factors such as the number of schools in a cluster, the implementation activities at each level of the model, the type of commitment to the support of the program that different tiers of education are prepared to make, and whether it is the first year of implementation or a subsequent year. An overview of what is covered in the professional learning workshops is provided below.

## **Region and Principals' Information Session**

The first professional information session provided as part of the *QuickSmart* program's implementation entails a two-hours meeting for senior administrators, principals and other members of school executives. This meeting offers senior staff the opportunity to engage briefly with details of the program, examine the results of the research that establishes the intervention's effectiveness, and understand the necessary commitments to being involved in the *QuickSmart* program.

At this session participants have the opportunity to ask questions and to address or clarify relevant issues. On the basis of the information presented during this day, principals decide whether their schools will participate in the *QuickSmart* program.

## **Principals' Professional Learning Workshop**

The first professional learning opportunity provided as part of the *QuickSmart* program's implementation is a workshop session lasting a full day for principals and other members of school executives. The purpose here is for senior school personnel to engage deeply with details of the program including the rationale, theory base and instructor roles, and to examine more thoroughly the results of the research that establishes the intervention's effectiveness and the implications of this to school implementation. Where possible, site visits to an existing school that is using *QuickSmart* is arranged. Please refer to Appendix 5 for a sample agenda for the Principals' Professional Learning Workshop.

It is important to inform and encourage the involvement of school leaders in the implementation of *QuickSmart* in order to set up conditions conducive to the

sustainability of the program. School executive members administer budget allocations and oversee staffing decisions that can affect which programs continue successfully in their schools.

Commencing in 2010, Principals will be expected to attend a further workshop day in the second and subsequent years of *QuickSmart* being implemented in their school. During these workshop sessions, the *QuickSmart* activities undertaken at their school in the previous year will be reviewed, and Principals will be supported in managing and extending the *QuickSmart* program's impact in the coming year. Most significantly, the focus in these workshops will more explicitly address the **transformational** aspects of *QuickSmart* for all students in the school and also for the school's educational and wider community members – the leadership team in a school, classroom teachers, teacher aides, and parents.

### **QuickSmart Professional Learning Workshops**

The *QuickSmart* professional learning program consists of an intensive series of professional inputs built around the *QuickSmart* intervention and research program. School *QuickSmart* Coordinators and *QuickSmart* Instructors participate in three two-day professional learning workshops within a year. At these workshops participants learn about and discuss the underlying perspectives informing the program, trial the *QuickSmart* materials, refine their teaching and assessment techniques, and share their experiences with peers.

The first professional learning workshop introduces the *QuickSmart* approach (please refer to Appendix 6 for a sample agenda), which is consolidated in the next two workshops. In the second and third workshops the *QuickSmart* team from each school reports back to other teams from schools that make up a geographically proximate learning community of about 10-15 schools (please refer to Appendices 7 and 8 for sample workshop agendas).

The professional learning program accompanying *QuickSmart* is focused on supporting instructors to understand and provide:

- effective instruction that maximises student on-task time, and provides learning scaffolds to ensure that students experience improvement and success;
- deliberate practice that is integral to every lesson, allows for success and is focused on providing targeted feedback to improve learning;
- guided and independent timed practice activities;
- strategy instruction and concept development;
- confidence to their students by encouraging a 'can do' attitude;
- appropriate teacher and peer modelling; and
- motivational academic activities that provide opportunities for modelling and for developing fluency.

As a consequence of the project and professional learning experiences, *QuickSmart* instructors learn to:

- use time as a dimension of learning and practice;
- incorporate concepts of automaticity (being ‘Quick’) and accuracy (being ‘Smart’) regularly in their teaching;
- structure learning activities built about deliberate practice to help encourage success;
- address individual student needs in their planning over an extended period;
- assess and monitor student needs unobtrusively in their teaching programs;
- create a highly motivational learning environment for students;
- integrate assessment tasks into each lesson, alongside a non-competitive focus on individual improvement; and
- design and develop activities that improve students’ information processing abilities by freeing up working memory.

The professional learning sessions and implementation of the intervention programs also provide opportunities for instructors to experience how:

- automaticity requires conceptual understanding and efficient, effective strategy use; and
- assessment provides formative information relevant to the progress and design of each individual student’s program.

## **Supervisors’ Professional Learning Workshop Sessions**

From 2010, workshop sessions will be offered to School *QuickSmart* Coordinators and to Cluster Supervisors of *QuickSmart*. The roles of these two groups of people are important in ensuring the fidelity of the program and in allowing the people who occupy these positions to have the professional grounding to understand more fully the theoretical aspects of *QuickSmart* as well as appropriate instructional techniques and professional knowledge.

In the case of the school *QuickSmart* Coordinators, this will involve in the first year a one-day workshop three times over the year. In practical terms this will occur at the end or close to when the two-day workshops occur. The key points here relate to their mentorship work with *QuickSmart* Instructors and how to approach the issues that arise using supportive and developmentally-based learning procedures. Teachers in this role will be able to use this work as evidence to support growth up to, or at, the third tier of professional learning, referred to in NSW as *Professional Accomplishment*.

In the case of the *QuickSmart* Cluster Supervisor, professional learning activities will involve an intensive three-day professional school at the University of New England. Specific issues addressed will include: theoretical underpinnings of *QuickSmart*; techniques and skills in managing a large-scale intervention; practical and theoretical

advice concerning working with Principals (school *QuickSmart* Leaders) and school *QuickSmart* Coordinators; and in-depth work on establishing and implementing robust and informative Quality Assurance programs. In addition, there will be advice on ways of functioning within the larger region hierarchy.



## SECTION B: THE QUICKSMART RESEARCH PROJECT

As noted earlier in this Report, research indicates that if low-achieving students learn how to automatically complete basic tasks, this reduces the demands such routine tasks make on working memory thus freeing cognitive resources for higher-order processing such as using more advanced mathematical procedures and problem solving (Anderson, 1983; Ashcraft, Donely, Halas, & Vakali, 1992; Hanley, 2005; Zbrodoff & Logan, 1996). The *QuickSmart* research project aims to further investigate the relationship between automaticity, working-memory capacity, and learners' academic achievements.

This section of the Report provides an overview of the *QuickSmart* research project's design and methodology and includes descriptions of data collection procedures as well as explanations of how the data are analysed.

### Description of the *QuickSmart* Research Project

A critical aspect of the implementation of *QuickSmart* over the last eight years has been the attention paid to the ongoing intensive evaluation of the program. The research that informs *QuickSmart* is focused particularly on cognitive processing, the conditions necessary for gaining facility with lower order tasks or basic academic skills, and the potential complementary effects of improved mastery of these skills on higher order learning processes. Accordingly, the research has two overall goals:

- to investigate the conditions under which improved fluency with basic academic skills is developed; and
- to observe whether improved fluency with the basics has any effect on the performance of more demanding academic tasks, such as comprehension and mathematical problem solving, as reflected in students' performance on state-wide tests or standardized achievement tests.

The specific aims of the *QuickSmart* research project are to:

- develop a deeper understanding of the role of working memory load in information processing, and how this is implicated in the literacy and numeracy problems students encounter;
- develop detailed descriptions of cognitive obstacles that preclude students achieving acceptable standards of literacy and numeracy;
- prepare detailed profiles of individual students, documenting their development in literacy/numeracy over the period of an academic year;
- note procedures for overcoming common learning obstacles;
- gain insights into how the procedures developed for individual use may be generalised to suit whole or part classroom, or small group situations;
- explore ways of adapting the technology used in the project to assist classroom teachers and support personnel to identify and target particular problems that students face in areas of literacy and numeracy; and



- develop a set of design features that can be used by teachers and support staff to identify and help rectify particular problems in the areas of literacy and numeracy.

## Research Design

The *QuickSmart* project uses a quasi-experimental research design involving collecting and analysing pre-test and post-test data from two groups of students: (i) the ‘*QuickSmart* Students’, who participate in the numeracy and/or literacy intervention programs; and (ii) ‘Comparison Students’, who do not participate in the intervention programs. The procedures used to select participants and Comparison Students are explained in detail below.

The decision to use a quasi-experimental design (whereby participants and non-participants are carefully selected to meet set criteria) rather than an experimental design (where participants and non-participants are randomly assigned) was informed by ethical considerations: *QuickSmart* project developers do not want to deprive any of the students who would potentially benefit from participating in the intervention programs from opportunities to improve their academic performance (and thus their life chances as outlined in the introductory section of this report).

Significantly, we believe that serious data collection involves gathering information from all sites that participate in the *QuickSmart* program. It is the accumulation of evidence from multiple jurisdictions across a range of geographic and socio-economic contexts that should take precedence in establishing the veracity, usefulness, effectiveness and sustainability of an intervention program (rather than some large-scale single definitive study).

## Participant Selection

Primary school students who participate in the *QuickSmart* programs meet the following criteria:

- experiencing persistent difficulty in either literacy or numeracy;
- displaying a good attitude to working in small groups, and
- having average cognitive potential without major attention difficulties.

Likewise, participants from secondary school settings are selected by English and Mathematics head teachers using the criteria that the students:

- are experiencing learning difficulties in either literacy or numeracy;
- performed in the lowest two bands on the State-wide Year 7 screening tests; and
- had a regular school attendance pattern.

## Comparison Data

In order to gain a clearer indication of the effectiveness of the *QuickSmart* intervention for improving accuracy and automaticity of basic academic skills, CAAS

and standardised test data are collected from other students in the same grade as the participants in the study. In general, the group of comparison students included in the assessments consists of average-achieving students as nominated by their teachers in each of the areas of reading and numeracy. These comparison students complete the selected CAAS sub-tests in literacy or numeracy at the beginning and the end of the intervention and also participate in the standardised testing sessions.

Comparison data afford important opportunities to examine the differences in accuracy and automaticity levels for students with learning difficulties compared to a sample of average-achieving students. They also facilitate a comparison of the rate of increase in accuracy and automaticity between the participants in the *QuickSmart* program and average-achieving non-participant same-age peers.

### **Implications of research design for validity and generalisability**

Quasi-experimental research designs, in which the ‘treatment subjects’ (in this case, participants in the *QuickSmart* intervention programs) and ‘comparison subjects’ (non-participants) are deliberately assigned, provide a weaker case for causal conclusions than do true experimental research designs, but present a stronger case “for finding generalisable results under more realistic conditions” (Cooksey, 2007, p. 178). While true experimental research designs are generally seen as providing stronger evidence for claiming ‘cause and effect’ (in this case, that participating in the *QuickSmart* intervention program causes an improvement in academic performance), they do so in an artificial, highly controlled context, and it is thus more difficult to generalise the results in a context representative of real life (Cooksey, 2007, pp. 177 – 178).

Within educational research especially, there is also a complex interplay between many different variables (such as the students’ family situation, socio-economic status, the school they attend, past educational experiences, prior knowledge, their relationship with their teacher/tutor, etc) that are extremely difficult to control for. The developers of the *QuickSmart* research project have tried to address these problems in various ways as set out under the following headings.

### **Measures to minimise the limitations of the research design and extraneous variables**

The developers of the *QuickSmart* research project have taken several inter-related measures to simultaneously:

- maximise the potential of learners to benefit from the intervention programs;
- minimise the limitations inherent in conducting educational research that involves the complex interplay of several important variables; and
- increase the generalisability of the results obtained.

These measures include:

- setting realistic learning goals for *QuickSmart* participants;
- using various strategies to minimise the effects of individual differences (as outlined above) on learners’ development; and

- using quantitative data analysis methods that attempt to identify the extent to which variables other than the intervention program could possibly influence the results (as described in more detail in Section C of this report).

The *QuickSmart* project's research design is realistic in the expectations it holds of the learners (the *QuickSmart* participants) and this realism is achieved by using a quasi-experimental (rather than a true experimental) research design. Thus comparison students are deliberately selected on the basis of their academic achievement being either average or slightly above average as this comparison is both realistic and fair to the *QuickSmart* participants.

It would be unfair to inadvertently compare these learners' academic achievements to, for instance, the random assignment of a control group of high-achieving students. Such a comparison would also not provide a true measure of the effects of the *QuickSmart* intervention programs, which aim to bring students who are currently below benchmark up to benchmark.

Two of the extraneous variables mentioned above that all educational researchers have to deal with are differences in instructor knowledge and the availability of resources in different schools. The *QuickSmart* project addresses these by providing:

- professional development in the form of six days of intensive workshops to the teachers/tutors;
- a large variety of learning/teaching resources and detailed guidelines on their use; and
- ongoing support in the implementation of the intervention programs as required by individual schools and instructors.

As has already been discussed in this report, differences in learners' prior knowledge are established in the diagnostic pre-tests, and the *QuickSmart* learning/teaching model forms a continuous cycle whereby assessment informs further instruction. The small-group format of *QuickSmart* lessons also lends itself to the establishment of good working relationships between learners and *QuickSmart* instructors, thus helping to create a motivating learning environment that is more likely to result in academic success.

## **Quantitative Data Collection Assessments and Procedures**

Pre-test and post-test data are collected by school-based *QuickSmart* instructors/co-ordinators for *QuickSmart* and Comparison students using two forms of assessment: the Computer-based Academic Assessment System (CAAS) tests and independent state-wide or standardised achievement tests.

## **Cognitive Aptitude Assessment System (CAAS) Data**

Measuring accuracy and automaticity of basic academic skills and the recall of basic facts is an integral part of this research. Upon admission to the *QuickSmart* program students complete an assessment process consisting of listening and reading comprehension tests and CAAS tasks that measure the speed and accuracy of hierarchically arranged reading and basic mathematics tasks. Speed is measured using

tasks that involve the appearance of a stimulus on the computer screen followed by the student responding into a microphone.

The CAAS provides highly accurate measures of how rapidly students complete the tasks and an assessor then scores the response for accuracy. The CAAS assessment process involves completion of tasks that measure simple perception, letter naming, word naming, pseudoword naming (e.g., 'plok'), concept activation, sentence understanding, number identification, and addition, subtraction, multiplication and division tasks.

## State-wide or Standardised Test Data

Independently prepared tests in the form of state-wide tests or standardised achievement tests are used to provide data about the transfer of basic fact knowledge to more complex academic and cognitive tasks. To date, the Progressive Achievement Tests in Mathematics (PATMaths) and the Progressive Achievement Tests in Reading: Comprehension and Vocabulary (PAT-R) (Australian Council for Educational Research) are being used in New South Wales, South Australia, the Australian Capital Territory, and Victoria, and the Multilevel Assessment Program (MAP) is used in the Northern Territory.

In addition, data from relevant State/Territory tests (e.g., Basic Skills Tests; Student Numeracy Assessment Program (SNAP); English, Literacy and Language Assessment (ELLA); and the National Assessment Program Literacy and Numeracy (NAPLAN) have also been collected relevant to those *QuickSmart* students in the Year levels targeted by these assessments. As of 2008, the Basic Skills Tests, SNAP and ELLA, have been replaced by the NAPLAN tests.

While the Progressive Achievement Tests have Australian norms and are standardised tests independent of the researchers, they were not deemed suitable for use in the Northern Territory because of the particular language and educational contexts found in remote school settings. Instead, the Northern Territory Department of Education and Training (NTDET) developed a form of multilevel assessment specifically for use by students participating in the *QuickSmart* intervention. This assessment was constructed by the assessment branch of the NTDET and used items originally designed for, but not used, in Territory-wide assessments.

## Quantitative Data Collection Instruments

To facilitate the collection and recording of the quantitative data a variety of data collection forms were developed. The original data collection forms have been reviewed and refined by the *QuickSmart* team over time in order to better facilitate the ease with which school staff involved in the *QuickSmart* project can collect and record the required data.

*QuickSmart* staff record quantitative data on the following data sheets:

- *QuickSmart Literacy/Numeracy Information Sheets*, on which general data about participating schools and the *QuickSmart* program are recorded (please refer to Appendix 9);

- *Summary of Individual Student's Performance: QuickSmart Student* sheets, on which individual participating students' pre-intervention and post-intervention assessment results are recorded (please refer to Appendix 10);
- *Summary of Individual Student's Performance: Comparison Student* sheets, on which individual comparison students' assessment results from assessments sat at the same time as *QuickSmart* students are recorded (please refer to Appendix 11); and
- *QuickSmart Lesson Attendance Sheet*, on which *QuickSmart* lesson attendance records are kept for each student (please refer to Appendix 12).

In addition to support in the form of an overview of the data collection instruments being provided during the first Professional Development workshop, *QuickSmart* staff based in participating schools are also provided with written guidelines to assist them in completing the data collection sheets (please refer to Appendix 13).

## Qualitative Data Collection Instruments

Assessment 'self-factors' such as student self-efficacy, self-confidence, and scaffolded risk taking are an important part of the *QuickSmart* research framework. Qualitative data about such factors are obtained from learners (please refer to Appendices 14 and 15) and other stakeholders (school *QuickSmart* Coordinators and Instructors, and classroom teachers, school principals, and parents/guardians) who are encouraged to complete specifically-designed questionnaires (please refer to Appendices 16-25).

## Data Analysis Procedures

Part of the *QuickSmart* program is the collection of quantitative and qualitative data from all sites. As noted previously, quantitative and qualitative data are obtained by school-based *QuickSmart* staff (Instructors or Coordinators). All data are sent to the SiMERR National Centre at the University of New England, where they are transferred to electronic spreadsheets or word processing programs. In the case of the NT DET, officers have independently collected data from participating schools since 2006 and undertake the analysis before forwarding the results to SiMERR.

The analysis of the quantitative data presents the strongest empirical evidence that the intervention programs achieve their stated aim to improve learners' academic performance. This information is supplemented and enriched by the qualitative survey and interview data. These data are analysed using appropriate software to evaluate the effectiveness of the intervention programs.

## Quantitative Data Analysis Procedures

The first step in preparing for the analysis of the *QuickSmart* data from 2001 to 2008 was to complete combined databases so that they were as comprehensive as possible. This endeavour resulted in two database with a total of 2182 entries for *QuickSmart* students and 844 for comparison students. The SiMERR National Centre developed one database. The other was created independently by the Northern Territory (NT) Department of Education and Training based on the Multilevel Assessment Program (MAP) data collected in the NT.

The SiMERR National Centre database contains data from 1419 *QuickSmart* students and 401 comparison students while the database containing Northern Territory information consists of 763 *QuickSmart* students and 443 comparison students. Data excluded or missing were either not submitted to the SiMERR National Centre or Northern Territory Department of Education and Training or were not clearly interpretable (e.g., did not include the version of the ACER PAT assessments used, the length of the intervention, etc).

The analyses to be presented in the result section of this *QuickSmart* Report were completed by an independent statistical consultant, Dr Peter Grimbeek, of Griffith University, Queensland (see <http://www.grimbeek.com.au/>). Dr Grimbeek selected analyses and advised on the subsequent write up of these analyses. Dr Grimbeek's work provides an independent audit of the effectiveness of the *QuickSmart* intervention program. As Dr Grimbeek commented,

The *QuickSmart* database provides an unusually extensive range of mathematics and literacy measures related to intervention and comparison groups. More specifically, it is distinguished by its richness in terms of the totality of participants (more than 3000, with 1200 in the NT), the number of years across which data has been collected (2001-2008), the range of year levels involved (Years 3-11), and its relatively even gender balance (i.e., 50.4% female students). The program is for educational reasons directed to those with learning difficulties, with a relatively small subset (22%, excluding NT students) of comparison students who have progressed more normally. Analysis of outcomes based on this purposive sample identifies consistent differences in favour of *QuickSmart* participants, an outcome consistent with the value of the program.

The following section describes the main steps of the quantitative data analysis. Extensive appendices are provided to facilitate the further examination of the results. For example, Appendix 26 contains the descriptive statistics for the numeracy and literacy interventions using the SiMERR National Centre data and Appendix 27 shows the descriptive statistics for the Northern Territory. These appendices include descriptive statistics relating to a number of **composite** and **difference scores** that it was necessary to derive before the analyses could be completed.

Because the databases contained a number of cases where students recorded mid-intervention results but not final post-test scores, composite scores were created in order to maximise the number of data points available for analysis. Where final entries were missing, composite scores were formed using mid-intervention scores as final post-intervention scores. Creating **composite scores** in this way yielded a conservative set of final scores that underestimates the effect of the intervention.

Once composite scores were available, then **difference scores** were calculated by subtracting each student's initial score from his/her final composite score. Creating difference scores in this way emphasises the amount of growth evident on different measures included in the research design. These scores also act to control for pre-existing differences between students because they ameliorate the pattern (due to the design of the *QuickSmart* research) whereby the comparison students score considerably higher than *QuickSmart* students at pre-test.



In general statistical terms, the purpose of the analysis of variance (ANOVA) is to test for significant differences between means. A series of multivariate analyses of variance (MANOVAs) were used to investigate the effect of the *QuickSmart* intervention on a number of dependent variables – including standardised or state-wide tests, and measures generated by the CAAS software. The major rationale for utilising MANOVA was to examine whether the *QuickSmart* intervention program was associated with differences in mean scores obtained on a considerable number of dependent variables.

Stepwise regression was used to investigate the effect of a slightly larger set of predictors that included the *QuickSmart* mathematics and literacy intervention programs. As is customary, predictor variables (gender, intervention, grade level, year of intervention) were entered as dummy variables. Stepwise regression adds variables to a regression model based on purely quantitative criteria (i.e., amount of variance explained) and has the capacity to identify subsets of influential predictors. This method can be used to screen larger numbers of predictor variables efficiently.

The forward selection regression method means that variables are selected based on *R*-Squared values, that is, how well a regression line approximates real data points. *R*-Squared is a descriptive measure between zero and one that indicates how well one variable is at predicting another. At each step, the variable that increases *R*-Squared the most is selected, until none of the remaining variables are significant.

In addition to these analyses across the whole set of the *QuickSmart* data from 2001 to 2008, Effect Sizes were also calculated for each region or Territory where *QuickSmart* has been implemented since the program began. Effect Sizes were used here to quantify the effectiveness of interventions relative to comparison groups. Discussions of Effect Sizes allows analyses to be compared across different systems using different instruments, but more importantly, it enables researchers to move beyond the simplistic, ‘Does it work or not?’ to the more useful, ‘How well does it work in a range of contexts?’ Based on the work of Hattie (2009) an insignificant effect size is around 0.1, an average effect size is around 0.3, important effect sizes begin above 0.4 and significantly important effect sizes occur above 0.6.

## Qualitative Data Analysis Procedures

When conducting the qualitative data analysis for this report, the qualitative data were first reorganised in three stages:

- transcripts were separated by stakeholders;
- stakeholder transcripts were further separated by schools; and
- student transcripts were further separated by numeracy and literacy.

Each data file in NVIVO was assigned three attributes – region, school, and year. For every stakeholder, a set of ‘tree nodes’ was developed and each response was coded into one of the nodes. A limited number of responses were coded into two nodes where applicable. Nodes were developed for each question separately.

Finally, a summary of qualitative data report was developed for each stakeholder. For students, two reports were produced: one for numeracy and one for literacy. The

reports presented both quantitative information (e.g., the number of respondents, schools, and responses under each particular code) and qualitative information (a selection of salient quotes).

Only student data were separated by literacy and numeracy. With other stakeholders it was often difficult to determine whether they were commenting on literacy or numeracy. Many of their answers refer to *QuickSmart* in general. When it was not clear whether the response was about numeracy or literacy it was coded with the numeracy responses. If a response was clearly about literacy, it was coded separately under literacy. Consequently, in all reports (apart from the students' reports as already discussed) literacy responses followed the numeracy responses at the end of each question.



## SECTION C: QUANTITATIVE RESULTS – GENERAL

The emphasis in this report is on results from the *QuickSmart Numeracy* intervention. This emphasis is justified because the numeracy program has been most widely implemented and has resulted in a robust database, particularly since 2005. Within the data collected the emphasis for this analysis is on the results collected from standardised and state-wide testing. These data are theoretically important because they are indications of students' successful higher-order thinking and growing academic competence.

Therefore, in the following sections, results for the *QuickSmart* numeracy intervention on the standardised tests and state-wide assessments are discussed in detail first, followed by available information on the literacy program. The performance of Indigenous students is highlighted where possible in these analyses. Analyses of the CAAS measures using MANOVA and ANOVA statistics are summarised next. The following section presents the follow-up analyses using step-wise regression. Effect Size calculations across the NSW regions for the available *QuickSmart* data complete the presentation of quantitative results.

### Overall Results on Standardised and State-Wide Assessment Data

Examination of the mean differences from the descriptive statistics supplied in Appendix 26 and 27 indicate that across the board, students in the numeracy and literacy intervention groups improved more than the comparison students on (i) standardised measures of intervention and (ii) measures related to CAAS assessments. This is a consistent and robust statistical outcome.

### Progressive Achievement Tests in Mathematics

Difference scores based on the available raw scores from the standardised mathematics tests (Progressive Achievement Test) indicated that overall the average difference score for the 1354 *QuickSmart* students was 5.63 (SD = 6.84) compared to an average difference score of 3.78 (SD = 7.62) for the 530 comparison students.

It is important to note that over the eight-year span of this analysis, versions of the Progressive Achievement Tests used in schools have varied. Therefore, where possible, raw scores have been transformed to scale scores (PATM), which are consistent across all versions of the PAT tests.

Using available PATM data, the descriptive statistics indicate that the difference scores for 573 *QuickSmart* numeracy students averaged 6.70 (SD = 7.50), while difference scores for the comparison students averaged 3.67 (SD = 7.04). Importantly, the gain for 120 Indigenous students with PATM difference scores averaged an impressive 7.07 points (SD = 8.66). Table C.1 displays mean difference scores for data from the Progressive Achievement Tests in Mathematics.

**Table C.1: Means and Standard Deviations for PAT Difference Scores by *QuickSmart* and Comparison Students**

Group	<i>QuickSmart</i>		Comparison	
	Mean	SD	Mean	SD
RawScr Difference	5.63	6.84	3.78	7.62
PATM Difference	6.70	7.50	3.67	7.04

### Further analyses using MANOVA (Numeracy)

A between-groups multivariate analysis of variance (MANOVA) was conducted to determine the effect of group membership (*QuickSmart* or Comparison) on four dependent variables (DVs), (i.e., difference scores based on ACER PAT pre-test and composite score data). Significant effects were found for group membership on the multivariate dependent measures, Wilks'  $\Lambda = 0.71$ ,  $F(4,671) = 67.75$ ,  $p < 0.001$ .

Univariate tests (Analysis of variance (ANOVA)) provide an indication of whether specific independent variables (IVs) are significantly associated with specific DVs. The main effect for treatment condition was statistically significant for difference scores based on the raw PAT scores ( $F(1,674) = 35.19$ ,  $p < 0.001$ ), PATM scores across all versions of the PAT tests ( $F(1,674) = 16.42$ ,  $p < 0.001$ ), and PAT stanine scores ( $F(1,674) = 14.33$ ,  $p < 0.001$ ).

Table C.2 presents the means and standard deviations for the PAT mathematics tests.

**Table C.2: Means and Standard Deviations for each PAT Mathematics Test Dependent Variable for *QuickSmart* and Comparison Students**

Group	<i>QuickSmart</i>		Comparison	
	M	SD	M	SD
RawScore Dif Cohen's $d = .59$	4.93	5.14	2.20	4.30
PATM Dif	6.61	7.41	3.85	7.18
PctlRnkg Dif	11.87	14.72	9.53	16.74
Stanine Dif	1.04	1.15	.633	1.16

### Multilevel Assessment Program Scores in Mathematics (NT)

Data from students in the Northern Territory have been collected from 2005 to 2008. Comparison students in the Northern Territory are mostly drawn from urban and suburban schools. Small remote schools tend to include all eligible students on the *QuickSmart* program and either have very small comparison groups or none at all. Difference scores calculated from raw scores collected as part of the Multilevel Assessment Program (MAP) mathematics test indicated that the average difference score for 623 *QuickSmart* students was 7.03 (SD = 7.94) compared to an average difference of 5.12 (SD = 8.98) for the 318 comparison students. ANOVA with these scores as the dependent variables and with treatment groups as the independent variables indicated a statistically significant main effect for the *QuickSmart* program ( $F(1,939) = 11.13$ ,  $p = 0.001$ ).

Increasing numbers of Indigenous students have completed the *QuickSmart* numeracy project in the Northern Territory since 2005. In the database assembled as the basis of this report, 359 Indigenous students completed the pre-test MAP. Their average score was 15.8 (SD = 9.66). At post-test, the average score for 283 Indigenous students was 23.21 (SD = 9.66). The effect size for this improvement, in terms of Cohen's *d*, is educationally important at 0.78.

## Progressive Achievement Tests of Vocabulary and Comprehension

### Further analyses using MANOVA (Vocabulary)

An initial examination of mean scores across a range of measures found difference scores to be larger on average for those in the intervention group. However, the small sample size for literacy and relatively large standard deviations militate against treatment-related differences being statistically significant.

Table C.3 presents the means and standard deviations of the dependent variables for vocabulary for the *QuickSmart* and comparison groups.

**Table C.3: Means and Standard Deviations for each PAT Vocabulary Test Dependent Variable for *QuickSmart* and Comparison Students**

Group	<i>QuickSmart</i>		Comparison	
	Mean	SD	Mean	SD
RawDif Vocab Cohen's <i>d</i> = 0.27	3.16	5.27	2.00	3.26
ScaleDif Vocab	4.98	9.03	3.17	5.37
PctlDif Vocab	13.23	19.83	7.36	13.72
StanDif Vocab	0.97	1.61	0.27	0.90

Analyses of variance (ANOVA) for each dependent variable were conducted but all were non-significant. This finding is consistent with observations made during the initial experiences of implementing the *QuickSmart* literacy program. The students' vocabulary scores were consistently very low at the beginning of the intervention and difficult to impact. It appears necessary to improve students' word knowledge, rate of reading and level of comprehension before they begin to read more and thereby improve their vocabulary knowledge.

### Further analyses using MANOVA (Comprehension)

A one-way multivariate analysis of variance (MANOVA) was conducted to determine the effect of group membership (*QuickSmart* or Comparison) on four dependent variables related to comprehension performance, i.e., the difference scores created from the PAT pre-test and post-test comprehension score data.

Table C.4 presents the means and standard deviations of the dependent variables for the *QuickSmart* and comparison groups on the comprehension assessments.

**Table C.4: Means and Standard Deviations for each PAT Comprehension Test Dependent Variable for *QuickSmart* and Comparison Students**

Group	<i>QuickSmart</i>		Comparison	
	M	SD	M	SD
RawDif Comp Cohen's $d = 0.80$	5.72	5.24	1.09	5.01
ScaleDif Comp	6.84	6.42	1.06	5.77
PctlDif Comp	18.89	17.49	4.72	15.52
StanDif Comp	1.12	1.05	0.27	1.10

A significant Box's M indicated that the homogeneity of variance-covariance matrix assumption was violated because all of the dependent variables were based on the same test data. No outliers were evident, however, and MANOVA was still considered to be an appropriate analysis technique.

Whether students were in the *QuickSmart* cohort or not was significantly associated with the dependent measures (Wilks'  $\Lambda = 0.70$ ,  $F(4,39) = 4.25$ ,  $p=0.006$ ) taken as a group. The multivariate  $\eta^2$  measure of effect size based on Wilks'  $\Lambda$  was strong at 0.16 (where  $\eta^2 = 0.14$  relates to a Cohen's  $d$  value of 0.8).

Analyses of variance (ANOVA) statistics for each dependent variable were conducted as follow-up tests to the MANOVA. The main effect of the intervention condition was statistically significant for the PAT raw scores of comprehension ( $F(1,42)=7.01$ ,  $p<0.05$ ), PAT scale scores across all versions of the PAT tests ( $F(1,42)=16.42$ ,  $p<0.05$ ), for PAT percentile scores ( $F(1,42)=5.69$ ,  $p<0.05$ ) and for stanine scores ( $F(1,42)=5.23$ ,  $p<0.05$ ). These outcomes are consistent with the *QuickSmart* literacy program having a significantly beneficial effect on students' comprehension.

## Overall Results of the Analysis of CAAS Data

### *QuickSmart* Numeracy

The CAAS data comprise results from five tests based on sets of twenty randomly generated individual questions. The five tests are referred to as: number naming, addition, subtraction, multiplication, and division. In each test, scores are collected for both percentage accuracy (accuracy) and the average time taken for a response to each question (speed).

Table C.5 below summarises the MANOVA and ANOVA statistics for all CAAS assessments in mathematics.

**Table C.5: Influence of mathematics intervention group on mathematics outcomes**

Dependent Variable	df	Df error	MS	F	Sig.
Numerical identification speed	1	582	2.361	9.379	**
Numerical identification accuracy	1	582	15.899	0.688	NS
Addition speed	1	1020	93.537	40.958	***
Addition accuracy	1	1020	2216.907	21.527	***
Subtraction speed	1	967	135.264	49.685	***
Subtraction accuracy	1	967	6233.29	44.278	***
Multiplication speed	1	953	256.718	40.564	***
Multiplication accuracy	1	943	17388.33	58.71	***
Division speed	1	914	379.903	60.969	***
Division accuracy	1	914	24344.567	78.079	***

\*\* $p < 0.01$ , \*\*\* $p < 0.001$

Significant outcomes were obtained for group membership (*QuickSmart* versus Comparison students) on all the CAAS measures except for the accurate identification of numerals, which did not differentiate between the students because of the high accuracy levels of both groups. This group of findings is easily interpretable and important in terms of the design of the *QuickSmart* numeracy program and its focus on the accuracy of basic facts and speed of recall.

*QuickSmart* students spend considerable lesson time becoming ‘quicker’ at number fact recall and ‘smarter’ in strategy use. Their progress in improving the speed and accuracy of basic mathematics facts is monitored using the CAAS software throughout the *QuickSmart* Numeracy program.

### **QuickSmart Literacy**

The outcomes for literacy, while strong, were compromised in comparison with numeracy scores due to smaller student numbers. Whereas estimates of the statistical significance of the intervention group in relation to mathematics outcomes were based on 600-1100 participants, equivalent estimates in relation to literacy outcomes were based on approximately 40 participants.

MANOVA analyses in Table C.6 indicated that all four measures of comprehension from the Progressive Achievement Tests were predicted by participation in the intervention group. Again, these findings are important because they indicate that

students' success with basic knowledge can contribute to their improvement on higher-order tasks.

**Table C.6: Influence of literacy intervention group on literacy outcomes (MANOVAs or ANOVAs)**

Dependent Variable	df	Df error	MS	F	Sig.
Comprehension raw scores	1	42	177.341	6.583	*
Comprehension scale scores	1	42	275.793	7.015	*
Comprehension percentile rankings	1	42	1652.189	5.687	*
Comprehension stanine scores	1	42	5.939	5.23	*

\* $p < 0.05$

## Follow-Up Analyses Using Stepwise Regression

Stepwise regression analyses were undertaken as a follow-up to the MANOVA results. These analyses tested the hypothesis that background variables might have influenced intervention outcomes significantly. To this end, a series of step-wise regressions were completed, with each of the PAT difference scores as the dependent variables in turn, with the following dummy variables created as independent variables:

- *QuickSmart* numeracy intervention group;
- *QuickSmart* literacy intervention group;
- Male participants;
- Specific Year levels (Year 2, Year 3, Year 4, Year 5, Year 6, Year 7); and
- Specific program years (2001-2006, 2007, 2008).

The rationale for using step-wise regression was that this procedure makes no assumptions about the relative importance of variables and instead selects variables for entry into the model in an order that reflects the extent to which they explain shared variance, and the extent to which this sharing is statistically significant. Conversely, step-wise regression excludes variables from the model that do not explain a sufficient portion of the shared variance. A feature of this procedure is that when two variables overlap in their capacity to account for the shared variance, the variable with the greater capacity to do so is entered.

The major outcome of the step-wise regression was that the *QuickSmart* numeracy intervention predicted all of the mathematics change scores, and the literacy intervention predicted almost all of the literacy change scores. This means that the effect of the *QuickSmart* program was strong across both the standardized and CAAS measures.

In terms of background variables, the dummy variables of year level, year of the program and gender predicted outcomes at times, but not in a consistent pattern. For instance, in some cases, being in the program in 2001-2006 was associated with better outcomes, and at other times being in program in 2007 or 2008 would produce the same outcome, or vice versa. What this suggests is that the interventions were in fact the prime cause of measured changes for the better (i.e., greater accuracy and greater speed made the most consistent difference across all of the outcome measures).

The detailed analysis output of the step-wise regression is provided in Appendix 28 commencing with the initial MANOVAs. Given the initial MANOVAs indicated that the mathematics and literacy interventions were significantly associated with each and every outcome measure except those that could not be undertaken because of small response levels, these subsequent analyses should be read as supplementary to the analyses already discussed. They should not distract from the importance of the key qualitative findings already discussed that underscore the effectiveness of both the *QuickSmart* interventions.

### **QuickSmart Numeracy Effect Sizes for Regions and Years Using PATM Scores**

This section considers Effect Size statistics related to the improvement on the standardised Progressive Achievement Tests in Mathematics of students who participated in the *QuickSmart* Numeracy program from various regions and at various times since the program began. In particular, results are presented for schools in the Armidale Diocese from 2002-2004; Minimbah and Mirriwinni Gardens independent schools from 2007 and 2008; schools in the Lismore Diocese from 2002-2008; Western Region schools in 2007 and 2008; and North Coast Region schools in 2007 and 2008.

As discussed earlier in this report, Effect Sizes below 0.2 are considered poor, with an appropriate range of growth over an academic year for a student cohort established as within the range of 0.2 to 0.4. Effect-size scores of 0.4 to 0.6 are considered strong, those between 0.6 and 0.8 are considered very strong, while those above 0.8 represent substantial improvement of the order of approximately three years' growth. While possible, scores of 0.8 and above are not common in educational research and may be too much to expect of data from a large and diverse population of students. Significantly, those students in the bottom 25% of the achievement range usually record Effect Size growth scores of around 0.2 or less. It is not unusual for these students to record negative Effect Size scores.

The following tables, Table C.7 to C.11 report, without further commentary, the results from different education jurisdictions that are representative of the schools that have contributed to the SiMERR National Centre database from 2002 to 2008.



**Table C.7: Armidale Diocese Effect Sizes for 2002-2004**

	Pre-scores PATM (SD)	Post-scores PATM (SD)	Effect Size (Cohen's <i>d</i> )
<i>QuickSmart</i> students	47.12 (8.00) <i>n</i> = 30	52.14 (9.67) <i>n</i> = 28	0.56
Comparison students	59 (10.29) <i>n</i> = 12	61.56 (12.48) <i>n</i> = 9	0.22

**Table C.8: Minimbah and Mirriwinni Effect Sizes for 2007 and 2008**

	Pre-scores PATM (SD)	Post-scores PATM (SD)	Effect Size (Cohen's <i>d</i> )
<i>QuickSmart</i> students	37.91 (13.23) <i>n</i> = 23	44.09 (11.76) <i>n</i> = 23	0.49

**Table C.9: Lismore Diocese Effect Sizes for 2002-2008**

	Pre-scores PATM (SD)	Post-scores PATM (SD)	Effect Size (Cohen's <i>d</i> )
<i>QuickSmart</i> students	45.36 (8.73) <i>n</i> = 62	51.74 (7.12) <i>n</i> = 64	0.80
Comparison students	54.94 (7.46) <i>n</i> = 17	53.63 (7.87) <i>n</i> = 16	-0.17

**Table C.10: Western Region Effect Sizes for 2007 and 2008**

	Pre-scores PATM (SD)	Post-scores PATM (SD)	Effect Size (Cohen's <i>d</i> )
<i>QuickSmart</i> students	38.6 (10.71) <i>n</i> = 88	45.59 (10.15) <i>n</i> = 86	0.67

**Table C.11: North Coast Region Effect sizes for 2007 and 2008**

	Pre-scores PATM (SD)	Post-scores PATM (SD)	Effect Size (Cohen's <i>d</i> )
<i>QuickSmart</i> students	44.05 (8.24) <i>n</i> = 375	50.92 (9.53) <i>n</i> = 334	0.77
Comparison students	55.29 (7.93) <i>n</i> = 89	58.53 (10.31) <i>n</i> = 88	0.33

Two important observations summarise these Effect Size tables. First, the Effect Sizes obtained across these schools and jurisdictions are remarkably consistent, ranging from 0.49 to 0.80 with higher scores for the *QuickSmart* students over the comparison group's performance consistently evident. Secondly, across the board the Effect Sizes based on the scores of the *QuickSmart* students are well above the expected yearly average growth of around 0.3.

## SECTION D: ACADEMIC ACHIEVEMENT OF INDIGENOUS STUDENTS WHO PARTICIPATED IN THE QUICKSMART NUMERACY INTERVENTION PROGRAM (2002-2008)

National test data (Ainley, Kos, & Nicholas, 2008; Commonwealth of Australia, 2008a) provide a compelling case for the need to develop programs that improve the literacy and numeracy outcomes for students who are performing at or below the National Literacy and Numeracy Benchmarks. There is a specific need for such programs to be effective for Indigenous and rural students and those with a language background other than English (Ainley, Kos, & Nicholas, 2008; Commonwealth of Australia, 2008a). The QuickSmart numeracy program was developed in 2001, and has been refined over the years, to address the learning needs of these groups of students.

Increasing numbers of Indigenous students have participated in the *QuickSmart* numeracy program in the Northern Territory and the North Coast Region since 2006, and in the New England Region since 2008. As demonstrated by the analyses discussed below, Indigenous students who participated in the *QuickSmart* Numeracy intervention in all these regions have made impressive academic gains that are comparable to the academic gains made by non-Indigenous *QuickSmart* students.

### Analysis of Results: Effect Sizes

The effects of the *QuickSmart* Numeracy intervention program were measured by comparing the pre-intervention and post-intervention means of *QuickSmart* students' results in independent standardised tests – the Multilevel Assessment Program (MAP) in the Northern Territory and the Progressive Achievement Tests in Mathematics (PATMaths) in other states. The results demonstrate that both Indigenous and non-Indigenous students who participated in the *QuickSmart* Numeracy intervention program made significantly greater gains in academic achievement than did the Comparison students (who did not participate in the intervention program). Importantly, the post-intervention test results indicate that some progress has been made in narrowing the gap between struggling students (both Indigenous and non-Indigenous) and their average-achieving peers.

The use of effect size has been an important aspect of the *QuickSmart* data analysis plan. Effect sizes were used here to quantify the effectiveness of interventions relative to comparison groups. Discussions of effect sizes allows analyses to be compared across different systems using different instruments but, more importantly, it enables researchers to move beyond the simplistic, 'Does it work or not?' to the more useful, 'How well does it work in a range of contexts?'

Based on the work of Hattie (2009):

- Effect Sizes below 0.2 are considered poor, with an appropriate range of growth over an academic year for a student cohort established as within the range of 0.2 to 0.4;

- Effect-size scores of 0.4 to 0.6 are considered strong;
- Effect Sizes between 0.6 and 0.8 are considered very strong; and
- Effect-size scores above 0.8 represent substantial improvement of the order of approximately three years' growth.

While possible, effect size scores of 0.8 and above are not common in educational research and may be too much to expect of data from a large and diverse population of students. Significantly, those students in the bottom 25% of the achievement range usually record effect size growth scores of around 0.2 or less. It is not unusual for these students to record negative effect size scores.

Three important observations summarise the Effect Size results presented in the analyses below. First, the effect sizes for Indigenous *QuickSmart* students range from 0.43 to 0.86, with higher scores for the Indigenous *QuickSmart* students over the comparison group's performance consistently evident. Secondly, across the board the effect sizes based on the scores of the *QuickSmart* students are well above the expected yearly average growth of around 0.3. Thirdly, the Indigenous *QuickSmart* students' academic growth is comparable to that of their non-Indigenous peers: the effect size for Indigenous *QuickSmart* students in the New England and North Coast Regions (2002-2008) was 0.64 while that for the non-Indigenous *QuickSmart* students was 0.68, and the effect size for the Northern Territory (2006-2008) Indigenous *QuickSmart* students was 0.65 while that for the non-Indigenous *QuickSmart* students was 0.82.

The Indigenous *QuickSmart* students' results are discussed in more detail under the following headings:

- New South Wales Overall Indigenous *QuickSmart* Students' Results (2002 – 2008)
- Northern Territory Overall Indigenous *QuickSmart* Students' Results (2006-2008)
- Northern Territory 2006 Indigenous *QuickSmart* Students' Results
- Northern Territory 2007 Indigenous *QuickSmart* Students' Results
- Northern Territory 2008 Indigenous Students' *QuickSmart* Results
- Orara High School (North Coast Region, NSW) 2005/2006 *QuickSmart* Results
- Orara High School (North Coast Region, NSW) 2006/2007 *QuickSmart* Results
- Orara High School: Two-Year Study of Effects of *QuickSmart* Program on Student Academic Performance
- North Coast Region (NSW) 2008 *QuickSmart* Interim Results

- New England Region 2008/2009 DEEWR-Funded 2008/2009 *QuickSmart* Project Results

## New South Wales Overall Indigenous *QuickSmart* Students' Results (2002-2008)

The following Tables summarise the findings of an analysis of the results of Indigenous and Non-Indigenous *QuickSmart* students' academic performance in New South Wales over the period 2002-2008, as well as the academic results of Comparison students who did not participate in the *QuickSmart* Numeracy intervention program.

Paired results of the pre-intervention and post-intervention standardised PATMaths tests that were used as the basis for this analysis were available for 709 *QuickSmart* students (195 of whom were Indigenous students) and 216 Comparison students over the period 2002 – 2008. Effect sizes were not calculated when the number of students in the group was less than 10 as statistics based on such low numbers lack validity.

**Table D.1: Effect size of the *QuickSmart* Numeracy Intervention on the Academic Achievement of Indigenous Students in New South Wales (2002 – 2008)**

Region/School Sector	No of Indigenous <i>QuickSmart</i> Students	Indigenous <i>QuickSmart</i> Students		Effect size of Indigenous <i>QuickSmart</i> Students' Academic Achievement in Numeracy
		Pre-intervention PAT Test Results: Mean (Standard Deviation)	Post-intervention PAT Test Results: Mean (Standard Deviation)	
Armidale Diocese	0	N/A		
Independent Schools	15	37.47 (13.060)	43.13 (13.458)	0.427
Lismore Diocese	4	49.25 (3.594)	47.25 (2.217)	N/A
New England Region	89	39.00 (9.117)	44.81 (10.212)	0.600
North Coast Region	86	40.12 (9.857)	48.17 (10.912)	0.774
Port Macquarie	0	N/A		
Western Region	1	36.60	37.60	N/A

<b>TOTAL</b>	<b>195</b>	<b>39.57</b> <b>(9.767)</b>	<b>46.18</b> <b>(10.787)</b>	<b>0.642</b>
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**Table D.2: Effect size of the *QuickSmart* Numeracy Intervention on the Academic Achievement of Non-Indigenous Students in New South Wales (2002 - 2008)**

Region/School Sector	No of Non-Indigenous <i>QuickSmart</i> Students	Non-Indigenous <i>QuickSmart</i> Students		Effect size of Non- Indigenous <i>QuickSmart</i> Students' Academic Achievement in Numeracy
		Pre-Intervention PAT Test Results: Mean (Standard Deviation)	Post-intervention PAT Test Results: Mean (Standard Deviation)	
Armidale Diocese	26	46.69 (7.740)	51.77 (9.348)	0.592
Independent Schools	8	38.75 (14.420)	45.88 (8.149)	N/A
Lismore Diocese	58	45.09 (8.927)	52.05 (7.369)	0.850
New England Region	81	38.49 (11.883)	45.42 (9.917)	0.633
North Coast Region	250	45.56 (7.150)	51.94 (8.832)	0.794
Port Macquarie	3	47.67 (2.517)	50.67 (5.033)	N/A
Western Region	85	38.92 (10.697)	45.69 (10.175)	0.649
<b>TOTAL</b>	<b>511</b>	<b>43.25</b> <b>(9.563)</b>	<b>49.77</b> <b>(9.543)</b>	<b>0.683</b>

**Table D.3: Effect size of the *QuickSmart* Numeracy Intervention on the Academic Achievement of All (Indigenous and Non-Indigenous) Students in New South Wales (2002 - 2008)**

Total No of <i>QuickSmart</i> Students	Pre-Intervention PAT Test Results: Mean (Standard Deviation)	Post-intervention PAT Test Results: Mean (Standard Deviation)	Effect size of all <i>QuickSmart</i> Students' Academic Achievement in Numeracy
709	42.19 (9.756)	48.73 (10.030)	<b>0.661</b>

(NOTE: The above total includes 3 NESB students' results, which were not included in Tables D.1 and D.2).

**Table D.4: Effect size of the Academic Achievement of Comparison Students in the New South Wales (2002 - 2008)**

Region/School Sector	No of Comparison Students	Comparison Students		Effect size of Comparison Students' Academic Achievement in Numeracy
		Pre-Intervention PAT Test Results: Mean (Standard Deviation)	Post-intervention PAT Test Results: Mean (Standard Deviation)	
Armidale Diocese	9	59.11 (11.879)	61.56 (12.481)	N/A
Independent Schools	0	N/A		
Lismore Diocese	16	54.81 (7.687)	53.62 (7.873)	-0.153
New England Region	76	48.86 (12.461)	51.89 (12.077)	0.247
North Coast Region	93	54.86 (8.106)	57.65 (10.484)	0.298
Port Macquarie	0	N/A		
Western Region	22	46.08 (6.934)	53.45 (11.831)	0.760
<b>TOTAL</b>	<b>216</b>	<b>52.03 (10.473)</b>	<b>55.06 (11.417)</b>	<b>0.277</b>

**Table D.5: Effect sizes of the Academic Achievement of Indigenous and Non-Indigenous *QuickSmart* Students who participated in the *QuickSmart* Numeracy Intervention program and of Comparison Students in New South Wales (2002 - 2008)**

Region/School Sector	Effect Size of Indigenous <i>QuickSmart</i> Students' Academic Achievement in Numeracy	Effect Size of Non-Indigenous <i>QuickSmart</i> Students' Academic Achievement in Numeracy	Effect size of Comparison Students' Academic Achievement in Numeracy
Armidale Diocese	N/A	0.592	N/A
Independent Schools	0.427	N/A	N/A
Lismore Diocese	N/A	0.850	-0.153
New England Region	0.600	0.633	0.247
North Coast Region	0.774	0.794	0.298
Port Macquarie	N/A	0.754	N/A
Western Region	N/A	0.649	0.760
<b>TOTAL</b>	<b>0.642</b>	<b>0.686</b>	<b>0.277</b>

## Discussion

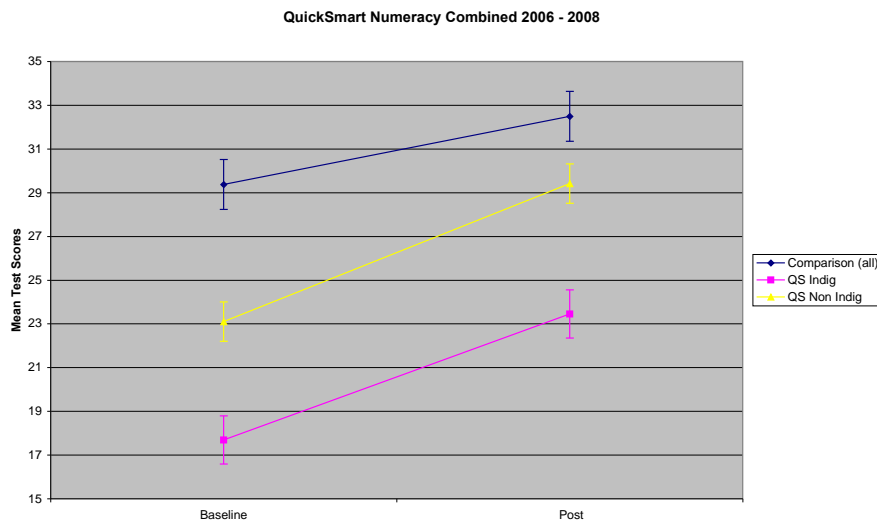
Table D.5 above shows that the effect sizes of the academic growth of Indigenous and the Non-Indigenous *QuickSmart* Numeracy students are very similar, and that the *QuickSmart* students demonstrated more than twice the academic growth (as measured by the pre-intervention and post-intervention independent standardised PATMaths test results) of the Comparison student group who had not participated in the Numeracy intervention.

## Northern Territory Overall *QuickSmart* Results (2006-2008)

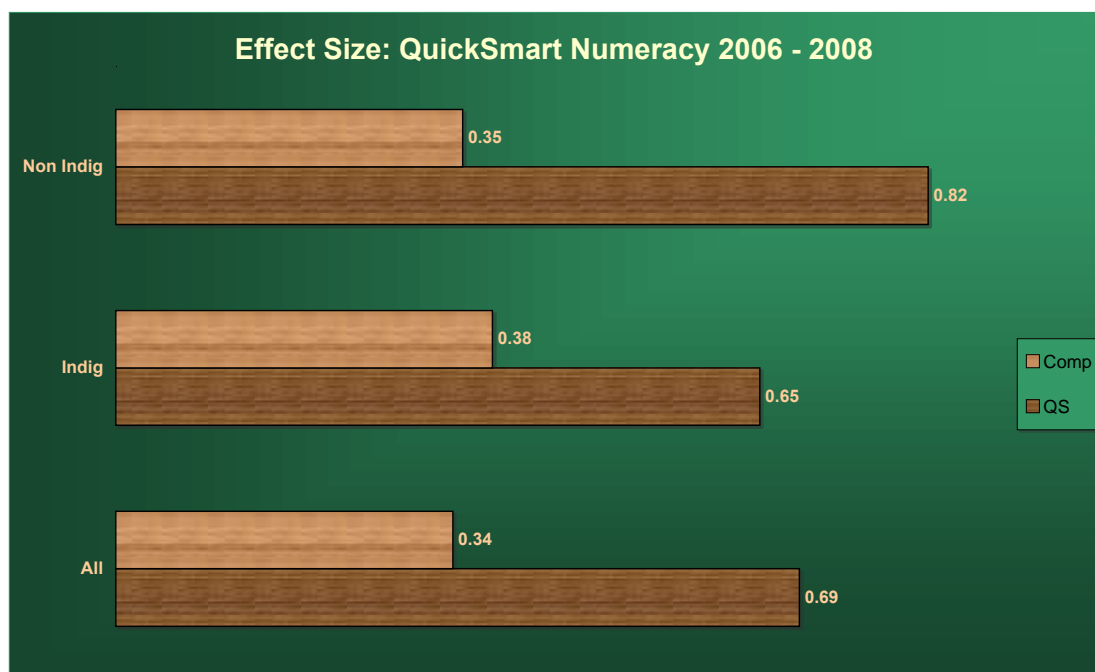
The *QuickSmart* program was initially piloted in 2005 in the Northern Territory, making 2008 the fourth year of the program. The main source of quantitative data for this program was the baseline and post-intervention Multilevel Assessment Program (MAP) style test. Pre- and post-intervention MAP tests were completed by all students undertaking the program in order to monitor the program's efficacy as it grew from a pilot project with eight schools in 2005 into a widely used approach being adopted by over 60 Northern Territory schools in 2009. Selections of average-achieving students who did not participate in the *QuickSmart* numeracy program also completed these tests in order to provide comparison data.



The analyses discussed below examined the pooled data from all participating schools, determining the effect size and significance of the *QuickSmart* student performance in relation to that of the comparison students and emphasising the academic performance of Indigenous students. In May 2009, Mr John Bradbury and Ms Joanne Jefferson of NT DET undertook an analysis of all paired data collected from Northern Territory schools involved in *QuickSmart* from 2006 to 2008. There were 526 students in *QuickSmart* (258 of whom were Indigenous) and 249 comparison students who completed pre- and post-MAP tests over the period. The results are provided graphically below in Figures D.1 and D.2.



**Figure D.1: Combined Results 2006 –2008 *QuickSmart* Numeracy program**



**Figure D.2: Combined Results 2006 –2008 *QuickSmart* Numeracy program, effect sizes**

The results in Figure D.1 illustrate that over the three years during which substantive data has been collected on *QuickSmart* Numeracy in the Northern Territory there has been substantial growth on a statewide test. Also observable is that despite the Indigenous *QuickSmart* students starting at a particularly low level on the MAP test the academic growth is similar to the growth experienced by the non-Indigenous students. In both cases, students enrolled in the *QuickSmart* program have “narrowed the gap”.

In Figure D.2 the results show the effect sizes for the different cohorts of students. In Table D.6 below a summary of the numbers of students in each cohort, upon which the analysis was undertaken, is provided.

**Table D.6: Numbers of *QuickSmart* and Comparison cohort students with paired data from 2006 – 2008 in the NT**

	Numbers of Non-Indigenous students	Numbers of Indigenous students	Total numbers of students
<i>QuickSmart</i> Cohort	268	258	526
Comparison Cohort	167	82	249

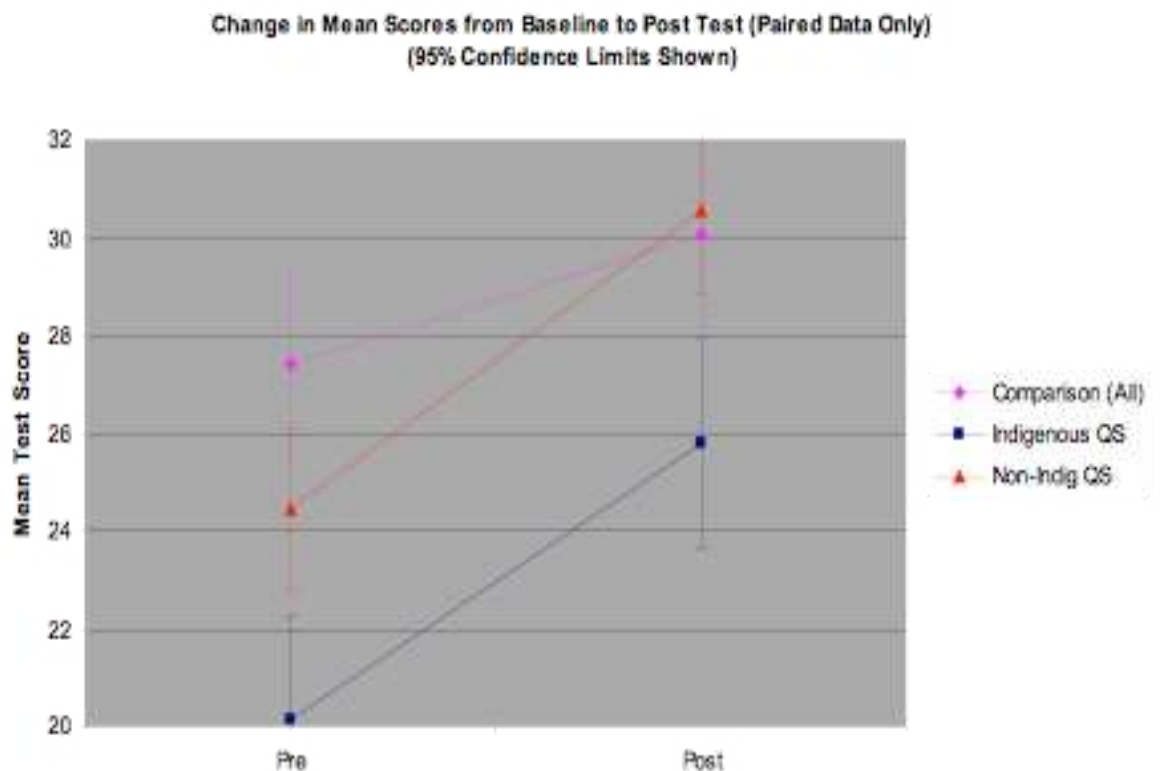
There are at least four significant features to be found in the data in Figure D2. Firstly, the average effect size for the average-performing comparison group lies within the traditional range of 0.2 to 0.4 as suggested by Hattie (2009). Secondly, the effect size of the *QuickSmart* students is significantly above the Comparison group, representing on average a two-to-three year growth by these students. Thirdly, these results represent a possible minimum effect as they include new schools that started the program either in 2006, 2007 or 2008 where the improvements, while significant, are below those to be expected in the second and subsequent years. Finally, these results also represent a possible minimum as the attendance data has not been applied to the results.

This last point means that the analysis data was carried out on all students who had paired (pre- and post-test) scores and does not distinguish among those students who may have been regular attenders and those who may have been less regular in their attendance or who might have been in a school that offered less than thirty weeks’ instruction.

## **Northern Territory 2006 Indigenous *QuickSmart* Students’ Results**

Data were collected from eleven schools across the ‘top end’ of the Northern Territory. Two schools were selected from the Darwin urban area, four from regional towns, two from rural areas, one from a remote township and two from remote Indigenous communities. All schools hosted Indigenous populations and supported English as a Second Language (ESL) learners. Students were selected from Years 5, 6 and 7. Generally, students who were underachieving in mathematics were chosen for the *QuickSmart* cohort while ‘average-achieving’ students were selected for the comparison cohort, although there were some exceptions to this convention.

While the results from some schools decisively demonstrated that the *QuickSmart* program positively impacted on the test performance of participating students, the results from others were not statistically conclusive. All schools, however, returned data that was suggestive of a positive effect. Pooling the data from all schools compounded these tendencies, disclosing a significantly greater improvement in the test performance of participating students compared with that of students who did not take part in the program. This change is illustrated in Figure D.3 below.

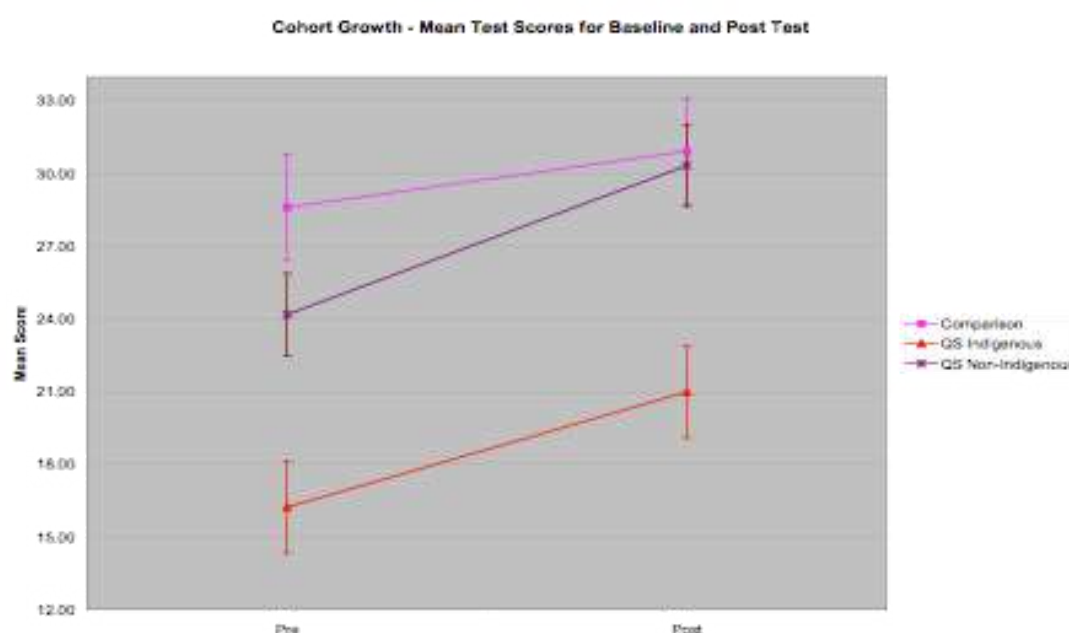


**Figure D.3: Pre- and post-Intervention *QuickSmart* and Comparison group data for 2006**

A comparative analysis of the Indigenous *QuickSmart* students', non-Indigenous *QuickSmart* students' and Comparison students' MAP test results are illustrated above. While Indigenous *QuickSmart* students returned a lower mean baseline test score than the non-Indigenous *QuickSmart* students, they improved their test performance by the same degree (as indicated by a similar slope of the growth lines), indicating that the program benefited the Indigenous students to the same degree as it did the non-Indigenous students.

## Northern Territory 2007 Indigenous *QuickSmart* Students' Results

Separate analyses of the Indigenous and non-Indigenous *QuickSmart* students show that those students in the *QuickSmart* program outperformed, in terms of growth, their comparison peers. The effect sizes for the Comparison, non-Indigenous *QuickSmart* and Indigenous *QuickSmart* groups in 2007 were 0.27, 0.81, and 0.51. Interestingly, despite the high achievement levels of the comparison group the Non-Indigenous students were able to score very close to these students by the end of the year. This is represented graphically in Figure D.4 below.



**Figure D.4: Pre- and post-Intervention *QuickSmart* and Comparison group data for 2007**

## Northern Territory 2008 Indigenous Students' *QuickSmart* Results

The 2008 *QuickSmart* cohort in the Northern Territory was divided into Indigenous and non-Indigenous results for comparative analysis. As in previous years, there was a strong similarity in the pattern of growth between the Indigenous and non-Indigenous *QuickSmart* results. A *t*-test confirmed that there was no significant difference in the growth between these cohorts ( $p = 0.41$ ), indicating that the program has been just as effective with Indigenous students as with non-Indigenous students. Analysis of the relative effect sizes (see below) confirmed that the two results were statistically indistinguishable ( $z = 0.805$ ,  $p = 0.2119$ ).

This does not explain why the gap was so pronounced, however. Both *QuickSmart* Indigenous and non-Indigenous groups showed a strong effect size of  $0.76 \pm 0.09$  and  $0.88 \pm 0.12$  respectively, well in line with previous years' results (e.g., ES was 0.51

and 0.81, respectively in 2007). A comparison of the 2008 results with the results from two previous years reveals some interesting similarities and differences.

Firstly, the confidence intervals of the means have become tighter over the years as the number of students in the study has grown. In addition, the baseline results of both the Indigenous and non-Indigenous *QuickSmart* cohort have declined from around 20 and 24 in 2006 to 16 and 21 respectively in 2008. This is probably due to the greater proportion of remote schools now included in the program (i.e., 10 schools out of 21 school data sets were collected) although this conjecture remains to be tested. Finally, the comparison baseline result has increased from around 28 schools in 2006 and 2007 to almost 33 in 2008, with the comparison effect size also rising from around 0.31 in 2007 to 0.51 in 2008. This could be due to many of the more remote and new schools failing to provide paired data for a comparison group, allowing the urban comparison results to be more strongly expressed (but this hypothesis, too, remains to be tested).

Reassuringly, growth for the both Indigenous and non-Indigenous *QuickSmart* students has remained strong and has been consistently greater than that of the comparison cohort for each year of the study. The results are summarised in Table D.7 below.

**Table D.7: Overall Effect Size Results for the Northern Territory in 2008**

	Effect size	Confidence Interval	Significance (wrt Comparison)
<i>QuickSmart</i> – All	0.78	$\pm 0.07$	$p = 0.0029$
<i>QuickSmart</i> – Indigenous	0.76	$\pm 0.09$	$p = 0.0174$
<i>QuickSmart</i> – Non-Indigenous	0.88	$\pm 0.12$	$p = 0.0033$
Comparison	0.51	$\pm 0.07$	

Despite an increase in the measured effect size of the comparison cohort in 2008, both Indigenous and non-Indigenous divisions of the *QuickSmart* cohort continued to demonstrate significantly greater growth compared with students who have not participated in the *QuickSmart* Numeracy intervention program.

## **Orara High School (North Coast Region, NSW) 2005/2006 *QuickSmart* Results**

Orara High School students' state-wide test results on the Secondary Numeracy Assessment Program (SNAP) have consistently been significantly below the state and regional averages. In 2005, when the school was first funded through the Priority Schools Program, the decision was made to address the numeracy problems of Year 7 and Year 8 students; with this aim in mind, the *QuickSmart* numeracy program was implemented at Orara High School in July 2005 and, as a result, sixty-seven low-achieving Year 7 students participated in the program during 2006.

Of the 12 Aboriginal and Torres Strait Islander students included in this group, eight students (66%) showed improvement on standardised measures. Five students who

had patterns of regular school attendance showed noticeable gains at the end of the *QuickSmart* program. The students who were consistently absent from school were identified as primarily the younger siblings of students who had been expelled from Orara High School.

The administration of Orara High School arranged for students to take the statewide SNAP assessments in Year 7 and again in Year 8. A cohort of students who completed the SNAP assessments in Year 8 had taken part in the *QuickSmart* project in Year 7 during 2005, so their results are of interest when considering the impact of the *QuickSmart* Numeracy program on Orara High School students.

The results of the SNAP assessments are compelling. For the first time Orara High School was placed first in the Coffs Harbour/Clarence region in terms of value adding for students in Numeracy. The school was placed ninth overall in the North Coast Region on SNAP results. Table D.8 below shows the Orara High School results compared to State and School Education Group averages.

**Table D.8: SNAP Numeracy Results for Orara High School (2006)**

Student Group	Orara High School SNAP Numeracy Results (2006)	State SNAP Numeracy Results (2006)	Local School Education Group SNAP Numeracy Results (2006)
All	2.83	2.44	2.43
ATSI	1.31	1.10	0.99
Effect size	0.30	0.24	NA

The results of the *QuickSmart* program at Orara High School brought with them attention from the Director General of the Department of Education and Training, Andrew Cappie-Wood and the Assistant Director General, Trevor Fletcher. Both these educators spent time at the school observing the *QuickSmart* program in action during 2006. As a result, the NSW DET supported extending the *QuickSmart* project. In addition, an informative article by Kim Cotton about the project appeared in the November 2006 issue of *Side-by-Side*. Of relevance here are the first two paragraphs (p.5) of this article:

It's not often that a school records a meteoric rise in student performance over a single year. So when Orara High School recorded the highest growth in its history for Year 8 literacy and numeracy, the principal, Graham Mosey, summed it up in three words: "We were thrilled!"

Last year almost half of the school's Year 7 cohort was under the national benchmark for literacy and numeracy. But in 2006, all of the students, now in Year 8, performed above the benchmarks – almost doubling the state average growth in their English Language and Literacy Assessment results, and more than doubling the state average growth in writing. Similar results were brought home for the Secondary Numeracy Assessment Program.

## Orara High School (North Coast Region, NSW) 2006/2007 *QuickSmart* Results

In 2006, 68 students undertook *QuickSmart* in Year 7. When the students were in Year 8 (in 2007) they undertook the state-wide SNAP test. This provided data on the growth of students over the period of their involvement in *QuickSmart*. Table D.9 summarises the results.

**Table D.9: SNAP Numeracy Effect Size Results for Orara High School and NSW State (2007)**

Student Group	Orara High School SNAP Effect Size (2007)	NSW State SNAP Effect Size (2007)
<i>QUICKSMART</i> non-Indigenous students	0.55	–
<i>QUICKSMART</i> Indigenous students	0.56	–
Non- <i>QUICKSMART</i> Indigenous students	–	0.26
Non- <i>QUICKSMART</i> students	0.49	0.30

The data shown above and reported as effect sizes are impressive for several reasons. There has been a further significant improvement from the results of the 2005-2006 Orara cohort. The *QuickSmart* student effect sizes of 0.55 and 0.56 are important given that this includes all students who were enrolled in *QuickSmart* at Orara High and does not remove those students who had poor attendance. Also, traditionally the *QuickSmart* students (i.e., those below benchmark) are those students that historically have the lowest effect size scores. It is also important to note that the *QuickSmart* Indigenous students' effect size is more than double the state effect size for Indigenous students (i.e., 0.56 as opposed to 0.26).

## Orara High School: Two-Year Study of Effects of *QuickSmart* Program on Student Academic Performance

The release of the National Assessment Program – Literacy and Numeracy (NAPLAN) data for Orara High School has meant that the analysis of data of students who have participated in the *QuickSmart* program can be extended to consider the impact of the program over an extended period on state/national testing initiatives. The purpose of the discussion here is to build on the strong empirical basis already established at Orara High School concerning *QuickSmart* that showed that at the end of the program students had shown considerable growth.

In 2006, 41 Year 7 students were below the national benchmark for numeracy as indicated by the SNAP data. In 2008 only 2 former *QuickSmart* students were below benchmark in Year 9 as indicated by 2008 NAPLAN results. The results were: 2 students attained Band 5 (considered below benchmark in NAPLAN for Year 9); 14 students attained Band 6; 8 students attained Band 7; 2 students attained Band 8; 3 students were absent for the NAPLAN test; and the remaining 12 former *QuickSmart* students had left the school since 2006. The two former *QuickSmart* students who were below benchmark were identified as having been diagnosed with mild intellectual disabilities (IM); however, over the two years these students made above average improvement.



The calculation of effect sizes reveals a strong trend that can be attributed to the *QuickSmart* program. For the 44 students with matched data the effect size over the two-year period was 1.03 and for the Indigenous students the effect size was 0.89. This compares to an effect size of 0.55 for the average and above-average students at Orara High School who did not participate in the *QS* program, and a plausible estimated effect size of 0.56 for all students in NSW.

## North Coast Region (NSW) 2008 *QuickSmart* Interim Results

In 2008 there were 16 schools in the North Coast Region using the *QuickSmart* (*QS*) program. Data were submitted in 2008 for 274 students who participated in the *QuickSmart* project. Of these, 186 were *QuickSmart* participants (including 52 Indigenous participants) and 36 were comparison students.

The breakdown of student numbers based on data to hand by 22nd December 2008 is shown in Table D.10 below.

**Table D.10: Number of *QuickSmart*, Indigenous and Comparison Students**

School	Number of Students
High School 1*	3 <i>QS</i> , including 3 Indigenous and 0 valid comparison students
Central School 1	27 <i>QS</i> , including 7 Indigenous and 3 valid comparison students
High School 2	49 <i>QS</i> , including 4 Indigenous and 5 valid comparison students
High School 3	35 <i>QS</i> , including 14 Indigenous and 5 valid comparison students
Primary School 1	8 <i>QS</i> and 8 valid comparison students
Primary School 2	20 <i>QS</i> , including 5 Indigenous and 6 valid comparison students
Primary School 3	33 <i>QS</i> , including 14 Indigenous and 4 valid comparison students
Primary School 4	11 <i>QS</i> , including 5 Indigenous and 5 valid comparison students

Students were selected from Years 4, 5, 6, 7, 8 and 9. Generally, students who were underachieving in mathematics were chosen for the *QuickSmart* cohort while average-achieving students were selected for the comparison cohort. Most *QuickSmart* students at High School 1 are not included as they have not completed 30 weeks of the program. All students underwent a pre- and post-test assessment on the Progressive Achievement Test (PAT) in numeracy.

All schools were used to calculate the effect size for the North Coast Region *QuickSmart* and comparison group students, and the results are summarised below:

- The effect size for the North Coast Region *QuickSmart* students for 2008 is 0.809 whilst the comparison group had an effect size of 0.413.
- The Indigenous *QuickSmart* students within the North Coast Schools had an effect size of 0.859. This represents a further improvement from 2007 when the effect size for the North Coast region *QuickSmart* students was 0.75 and the effect size of the Comparison Group was 0.19.

For those schools with reasonable numbers of Indigenous students in *QuickSmart*, the effect sizes for the Indigenous *QuickSmart* students were:

- High School 3            1.04
- Primary School 3        1.29

These effect sizes represent impressive and considerable academic growth for these children. Given that expected growth should be in the range of 0.2 to 0.4, these results represent more than two and three years' growth on average for the 30-week *QuickSmart* Program. This indicates that the *QuickSmart* intervention program does narrow the performance gap between low-achieving students and their average-achieving peers.

## **New England Region 2008/2009 DEEWR-Funded 2008/2009 *QuickSmart* Project Results**

During 2008, Department of Education, Employment and Workplace Relations (DEEWR) funding supported the *QuickSmart* numeracy program in ten New England Region schools. Students were selected to take part in the *QuickSmart* program based on their need for support in order to improve their basic numeracy skills and on their consistent patterns of attendance at school. In total, 186 low-achieving students participated in *QuickSmart* lessons across the ten New England schools. Their results were compared to those attained by 67 comparison students from the same schools. Therefore, the grand total of participating students for this project was 253. Of the 186 *QuickSmart* students, 125 were identified as Indigenous students.

The following Tables summarise the findings of an analysis of the results of Indigenous and Non-Indigenous *QuickSmart* students' academic performance in the *QuickSmart* New England Region DEEWR-funded project in 2008/2009. Also shown are the academic results of Comparison students who did not participate in the *QuickSmart* Numeracy intervention program. Paired results of the pre-intervention and post-intervention standardised PATMaths tests that were used as the basis for this analysis were available for 119 *QuickSmart* students (78 of whom were Indigenous students) and 39 Comparison students. Although effect sizes were calculated when the number of students in the group was relatively low (in some cases less than 10), it should be noted that statistics based on such low numbers lack validity and that the total effect size numbers should therefore be the focus of attempts to evaluate the effectiveness of the *QuickSmart* Numeracy intervention program.

**Table D.11: Effect Size of the *QuickSmart* Numeracy Intervention on the Academic Achievement of Indigenous Students (DEEWR NER Project, 2008/2009)**

School	No of Indigenous <i>QuickSmart</i> Students	Indigenous <i>QuickSmart</i> Students		Effect Size of Indigenous <i>QuickSmart</i> Students' Academic Achievement in Numeracy
		Pre-Intervention PAT Test Results: Mean (Standard Deviation)	Post-intervention PAT Test Results: Mean (Standard Deviation)	
S1	14	35.057 (9.0402)	41.400 (11.0648)	0.628
S2	10	36.630 (5.6533)	43.340 (3.9141)	1.380
S3	No paired data available			
S4	7	29.600 (2.4000)	43.957 (2.0452)	6.439
S5	4	34.900 (4.8353)	37.450 (6.6766)	0.437
S6	14	41.264 (5.6770)	43.800 (9.1060)	0.334
S7	5	45.880 (9.4693)	50.940 (7.6872)	0.587
S8	12	42.708 (10.9959)	48.300 (9.3862)	0.547
S9	10	44.840 (6.8578)	49.480 (12.2892)	0.466
S10	2	32.250 (10.2530)	31.650 (3.4648)	N/A
<b>TOTAL</b>	<b>78</b>	<b>38.928 (8.7947)</b>	<b>44.565 (9.4369)</b>	<b>0.618</b>

**Table D.12: Effect Size of the *QuickSmart* Numeracy Intervention on the Academic Achievement of Non-Indigenous Students (DEEWR NER Project, 2008/2009)**

School	No of Non-Indigenous <i>QuickSmart</i> Students	Non-Indigenous <i>QuickSmart</i> Students		Effect Size of Non-Indigenous <i>QuickSmart</i> Students' Academic Achievement in Numeracy
		Pre-Intervention PAT Test Results: Mean (Standard Deviation)	Post-intervention PAT Test Results: Mean (Standard Deviation)	
S1	1	31.000 (N/A)	32.600 (N/A)	N/A
S2	10	39.830 (5.4589)	43.360 (4.4287)	0.710
S3	No paired data available			
S4	6	25.400 (14/6922)	43.483 (3.9458)	1.681
S5	1	35.500 (N/A)	44.300 (N/A)	N/A
S6	0	N/A	N/A	N/A
S7	2	47.500 (9.6167)	49.250 (5.3033)	N/A
S8	9	41.433 (5.1337)	50.511 (5.6310)	1.685
S9	4	49.825 (3.8091)	46.650 (7.3219)	- 0.544
S10	7	44.129 (6.2806)	47.629 (8.2225)	0.478
<b>TOTAL</b>	<b>39</b>	<b>40.059 (10.0875)</b>	<b>46.459 (6.1335)</b>	<b>0.767</b>

**Table D.13: Effect Size of the *QuickSmart* Numeracy Intervention on the Academic Achievement of All (Indigenous and Non-Indigenous) Students (DEEWR NER Project, 2008/2009)**

Total No of <i>QuickSmart</i> Students	Pre-Intervention PAT Test Results: Mean (Standard Deviation)	Post-intervention PAT Test Results: Mean (Standard Deviation)	Effect Size of all <i>QuickSmart</i> Students' Academic Achievement in Numeracy
119	39.144 (9.2244)	45.045 (8.5197)	0.665

**Table D.14: Effect Size of the Academic Achievement of Comparison Students (DEEWR NER Project, 2008/2009)**

School	No of Comparison Students	Comparison Students		Effect Size of Comparison Students' Academic Achievement in Numeracy
		Pre-Intervention PAT Test Results: Mean (Standard Deviation)	Post-intervention PAT Test Results: Mean (Standard Deviation)	
S1	7	40.686 (7.5274)	45.857 (8.8778)	0.628
S2	5	59.650 (8.4372)	60.983 (8.5978)	0.156
S3	No paired data available			
S4	2	47.300 (0.8485)	48.100 (8.7681)	N/A
S5	2	47.100 (14.4250)	54.150 (12.2329)	N/A
S6	4	43.375 (4.2406)	51.125 (4.2406)	1.828
S7	5	52.680 (7.3217)	62.080 (6.3724)	1.370
S8	5	54.720 (6.7046)	55.080 (7.0588)	0.052
S9	5	60.100	54.260	- 0.673

		(6.2534)	(10.5671)	
S10	3	61.300 (20.6463)	59.833 (16.2715)	0.079
<b>TOTAL</b>	<b>39</b>	<b>51.959</b> <b>(11.0330)</b>	<b>54.679</b> <b>(9.9168)</b>	<b>0.261</b>

**Table D.15: Effect Sizes of the Academic Achievement of Indigenous and Non-Indigenous *QuickSmart* Students who participated in the *QuickSmart* Numeracy Intervention program and of Comparison Students (DEEWR NER Project, 2008/2009)**

School	Effect Size of Indigenous <i>QuickSmart</i> Students' Academic Achievement in Numeracy	Effect Size of Non-Indigenous <i>QuickSmart</i> Students' Academic Achievement in Numeracy	Effect Size of Comparison Students' Academic Achievement in Numeracy
S1	0.628	N/A	0.628
S2	1.380	0.710	0.156
S3	No paired data available		
S4	6.439	1.681	N/A
S5	0.437	N/A	N/A
S6	0.334	N/A	1.828
S7	0.587	N/A	1.370
S8	0.547	1.685	0.052
S9	0.466	- 0.544	- 0.673
S10	N/A	0.478	0.079
<b>TOTAL</b>	<b>0.618</b>	<b>0.767</b>	<b>0.261</b>

## Discussion and Conclusion

Many hundreds of Indigenous students have undertaken *QuickSmart* in NSW and the NT. Also there have been many others but schools have not identified students who are Indigenous from non-Indigenous students. Overall, the data presented above highlights the impressive gains in academic growth that *QuickSmart* Indigenous students' have achieved. These students have more than doubled the effect size of the

Comparison students' academic growth. This can represent a factor of up to eight over the traditional growth of underachieving peers who do not participate in *QuickSmart*.

We conclude this section with comments taken from an Independent report prepared by Murphy and Thomas (2008) based upon an evaluation of federally funded *QuickSmart* intervention covering five months in late 2008. After five months of implementation, the effect size growth for Indigenous students ( $n=105$  matched pairs) of 0.42 on a standardised test of basic mathematics represents a watershed of successful learning for these children.

*The evaluators have been impressed with the outcome of the QS intervention program at its "half-way" mark. In spite of the late commencement of QS activities in nine of the ten participating schools, pre-test and mid-test standardised scores (as assessed via the PAT Scale) reflect improvements in Indigenous students' numeracy, particularly among female students. This success must obviously be attributed to the structure and delivery of QS—its theoretical and practical underpinnings are substantial and impressive—and also to its inherent attractiveness to students. In the nine schools in which the evaluators observed lessons being conducted students' enthusiasm was obvious and elements of both competition and cooperation spurred them on to further achievement.*

*In general, schools have endeavoured to familiarise parents with the QS program and to advise them of their children's achievements. To accomplish such has proved challenging in some cases where parental contact is difficult to initiate and to sustain. Nevertheless, progress in this regard has been made. Within the schools teachers in general have displayed both acceptance of the value of QS and support for its operation and continuation.*

*The sustainability of QS is seemingly assured in some schools, regardless of the challenge this poses with regard to employment of tutors. Elsewhere, although there is enthusiasm and support, the "resource problem" has led to uncertainty about continuation – cause for considerable disappointment and even some anxiety among coordinators and tutors.*

*Most noticeable to the evaluators is the importance of the tutors in the QS program. The QS team at University of New England has devoted and continues to devote attention to the elevation of tutors' standards. Of particular satisfaction to the evaluators has been the observation of so many Indigenous tutors conducting QS lessons. These tutors are enthusiastic and devoted and with few, if any, exceptions, keen to expand their knowledge of QS in future professional development workshops. (L.Murphy & A.R.Thomas, 2008)*



## SECTION E: QUANTITATIVE RESULTS – INDEPENDENT REPORTS

This section summarises information from the major reports on the effectiveness of the *QuickSmart* program authored by independent sources. The reports are presented in five major sub-sections.

- Results from the Northern Territory, analysed by John Bradbury for 2006, 2007 and 2008 (and Joanne Jefferson, 2008), are presented in the first sub-section.
- The second sub-section results are from Ms Lyn Alder's reports on Orara High School (a government school in Coffs Harbour in the North Coast Region of New South Wales), for 2005-2008. Also included in this sub-section are the results of a longitudinal study of students at Orara High School based on state-wide testing using SNAP scores for 2006 and 2007, and NAPLAN scores for 2008.
- The third sub-section reports a summary of data covering a cluster of schools in the North Coast Region for 2007 and 2008, prepared by Ms Lyn Alder for the Region Director.
- The penultimate sub-section is a report developed by Ms Sally Mackander (ESL/ESD Co-ordinator) of an NT School of the Air for the First International Symposium for Innovation in Rural Education (ISFIRE). It concerns a trial in 2008 of the *QuickSmart* program over distance through the facilities at an NT School of the Air.
- The final sub-section discusses a preliminary analysis of data obtained from ten schools in the New England Region of NSW. This final sub-section includes a summary of some of the findings by the independent review team, Mr L. Murphy and Professor A. R. Thomas, funded through DEEWR in 2008 as part of The Parent School Partnerships Initiative (PSPI) Program.

### Northern Territory Results

The following discussion was adapted from several reports prepared by education officers in the Northern Territory for 2006 – 2008, the most recently released report being the *Preliminary Report of the 2008 QuickSmart Intervention Results in the Northern Territory* authored by Mr John Bradbury and Ms Joanne Jefferson.

The *QuickSmart* (QS) program was initially piloted in 2005 in the Northern Territory, making 2008 the fifth year of the program. The main source of quantitative data for this program was the baseline and post-intervention Multilevel Assessment Program (MAP) style test. Pre- and post-intervention MAP tests were completed by all students undertaking the programme in order to monitor the programme's efficacy as it grew from a pilot project with eight schools in 2005 into a widely used approach being adopted by over 60 NT schools in 2009. Selections of average students who did not participate in the *QuickSmart* numeracy program also completed these tests in order to provide comparison data.

The analyses discussed below examined the pooled data from all participating schools, determining the effect size and significance of the *QuickSmart* student performance in relation to that of the comparison students. The performance of Indigenous students was also examined.

## **Northern Territory 2006 *QuickSmart***

The following summary of the 2006 *QuickSmart* intervention results in the Northern Territory are extracts from an independent report prepared by Mr John Bradbury and Mr Geoff Gillman (please refer to the full report in Appendix 29).

The overall objective of the *QuickSmart* Northern Territory (NT) Pilot project was to rigorously research and evaluate the impact of *QuickSmart* on the numeracy development of targeted upper primary students. NT Multilevel Assessment Program (MAP) test data provide a compelling case to identify programs that will improve numeracy outcomes for students that are performing below the National Literacy and Numeracy Benchmarks and well below their cohort peers. There is a particular need to identify approaches that are effective for Indigenous students with a language background other than English (LBOTE).

In addition, an analysis of student-matched 2001 Year 3 and 2003 Year 5 MAP test data identified a substantial systemic decline in both the number and percentage of students achieving Numeracy benchmarks between Year 3 and Year 5. This was repeated with the 2002/2004 cohort, indicating the beginnings of a trend that needs to be attended to as a matter of urgency.

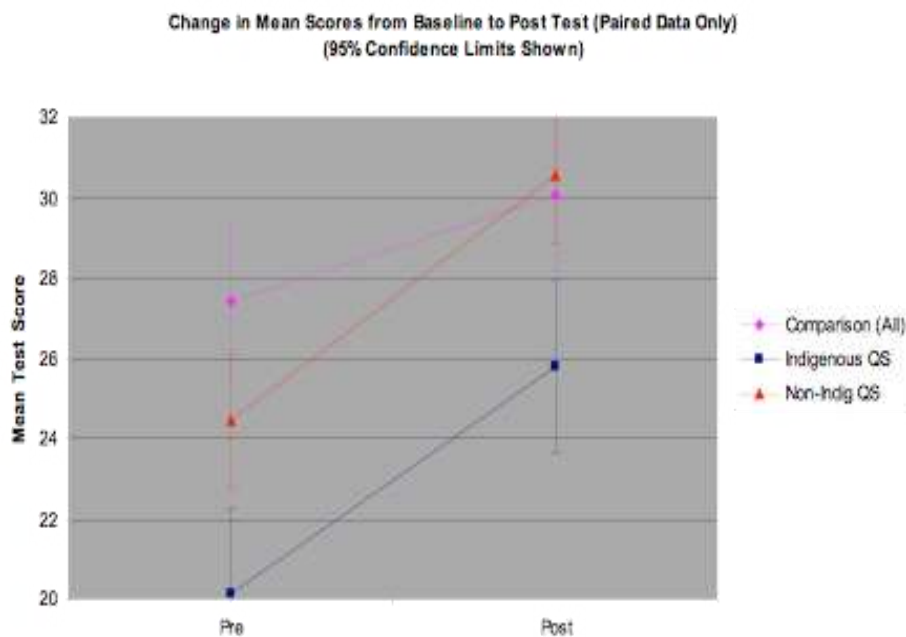
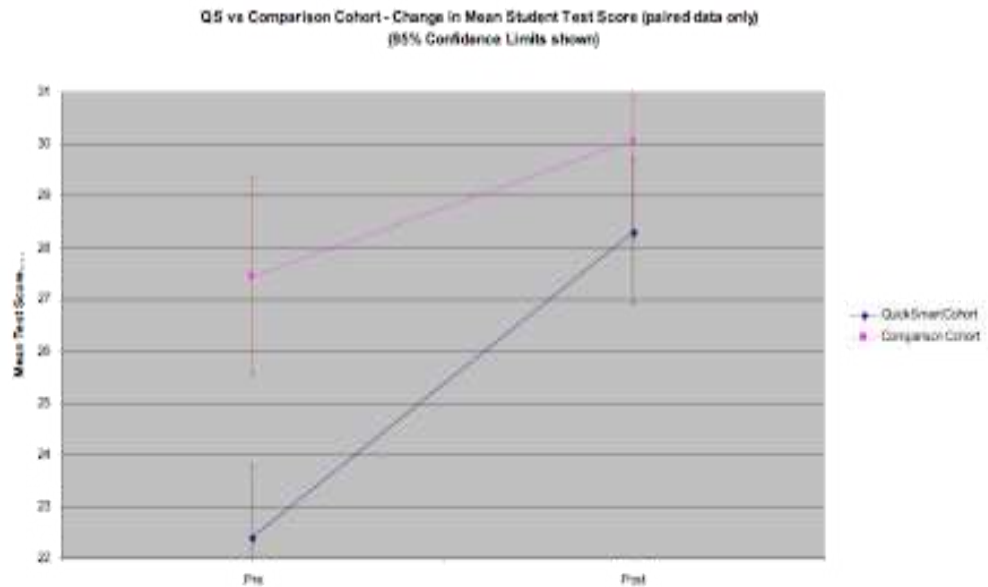
Data were collected from eleven schools across the ‘top end’ of the Northern Territory. Two schools were selected from the Darwin urban area, four from regional towns, two from rural areas, one from a remote township and two from remote Indigenous communities. All schools hosted Indigenous populations and supported English as a Second Language (ESL) learners. Students were selected from Years 5, 6 and 7. Generally, students who were underachieving in mathematics were chosen for the *QuickSmart* cohort while ‘average-achieving’ students were selected for the comparison cohort, although there were some exceptions to this convention.

Most schools complied with the recommended format when implementing the *QuickSmart* program: that the program run for a minimum of 20 weeks and that the students attend three sessions per week for 30 minutes per session. Most schools were also able to provide dedicated areas, which were physically isolated from the ongoing classroom activities, for students to attend *QuickSmart* sessions. Student absenteeism, initial workload, insufficient tutors and tutor turnover were some of the more common challenges reported.

Quantitative data were obtained through the administration of baseline (pre-intervention) and post (post-intervention) tests. Identification of students was done partly through the development of *QuickSmart* specific testing in the Northern Territory. In the Northern Territory, the same test was administered as a pre-test and as a post-test. This specially designed *QuickSmart* test was constructed from ‘left-over’ items devised for the state-wide MAP that is used as a state-wide assessment framework in the Northern Territory.

While the results from some schools decisively demonstrated that the *QuickSmart* program positively impacted on the test performance of participating students, the results from others were not statistically conclusive. All schools, however, returned data that was suggestive of a positive effect. Pooling the data from all schools compounded these tendencies, disclosing a significantly greater improvement in the test performance of participating students compared with that of students who did not take part in the program.

This change is illustrated in the graph shown below (Figure E.1).



### Figure E.1: Pre- and post-Intervention *QuickSmart* and Comparison group data for 2006

As a result of the cohort selection process, there was a significant difference in the baseline test performance between the two groups. Post intervention, however, the difference in test performance between the *QuickSmart* and Comparison students was not significant. The effect sizes are 0.68 and 0.31, respectively for the *QuickSmart* and Comparison cohorts.

The test results of Indigenous students were subsequently analysed separately. The relative improvement of the Indigenous *QuickSmart* students is illustrated above.

While Indigenous *QuickSmart* students returned a lower mean baseline test score than the non-Indigenous *QuickSmart* students, they improved their test performance by the same degree (as indicated by a similar slope of the growth lines), indicating that the program benefited the Indigenous students to the same degree as it did the non-Indigenous students.

The qualitative information received from the participating schools was consistently positive in terms of the perceived impact of the program on student outcomes in mathematics. All stakeholders, including management, parents, staff, facilitators and students, shared these positive perceptions. There was also a consensus that participating students gained confidence generally, resulting in improved performances in subject areas other than mathematics. Examples of stakeholders' comments are as follows:

“Students have more confidence and are more likely to give things a go that relate to basic maths.” (*QuickSmart* instructor)

“Twelve months after the *QuickSmart* program last year and those students have maintained and progressed very well.” (Class teacher)

“Children are always keen to go. Parents note children talking about their work in the program. Teacher feedback has been very positive.” (Principal)

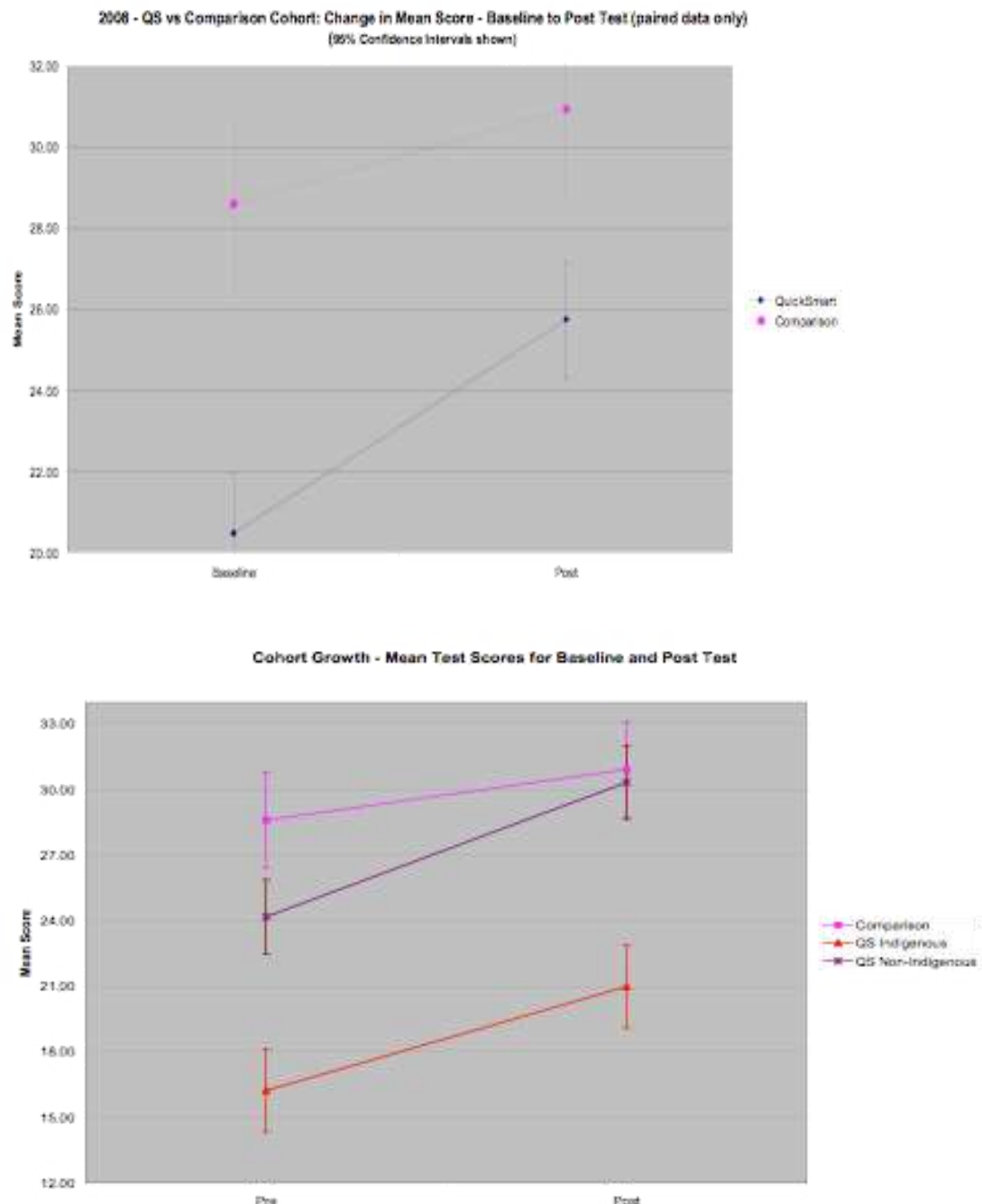
### Northern Territory 2007 *QuickSmart* Results

The results from the 2007 cohort are illustrated in Figure E.2 below.

Once again the *QuickSmart* program continues to narrow the gap. However, there are two features to note about this diagram in comparison with that for 2006. These are that the comparison group in the pre-test performed better on average than the comparable group in the previous year while the *QuickSmart* cohort scored lower than the previous year's cohort; hence, the gap between the two groups was larger. Having said that they started further apart at the beginning, the growth for the year mirrors the results for 2006 – with an effect size for the Comparison Group of 0.27 and for the *QuickSmart* group of 0.60.

A further analysis separated out the Indigenous and non-Indigenous *QuickSmart* students. Once again we see that those students in the *QuickSmart* program outperformed, in terms of growth, their comparison peers. The effect size for the Comparison, non-Indigenous *QuickSmart* and Indigenous *QuickSmart* groups are 0.27, 0.81, and 0.51. Interestingly, despite the high achievement levels of the

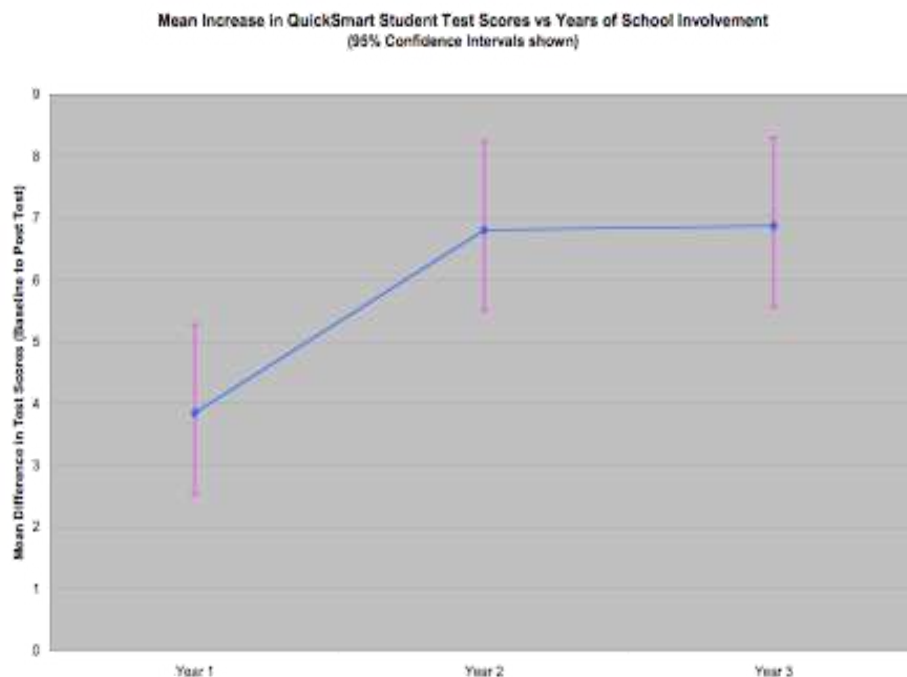
comparison group the Non-Indigenous students were able to score very close to these students by the end of the year. This is represented graphically in Figure E.2 below.



**Figure E.2: Pre- and post-Intervention *QuickSmart* and Comparison group data for 2007**

In the 2007 report, Mr John Bradbury undertook two additional analyses. The first looked at the growth schools could achieve in student learning outcomes as they implemented the program beyond the first year. The second looked at a small cohort of 20 students whose schools had decided to keep in the program for a further 30 weeks.

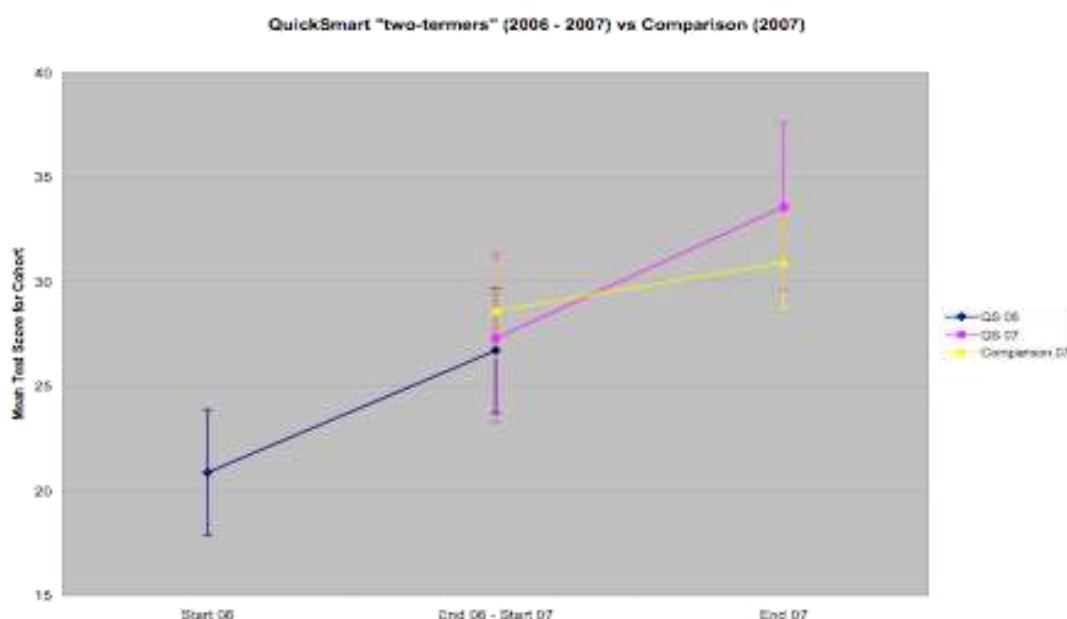
The first analysis is provided in Figure E.3.



**Figure E.3: School improvement scores over three years for *QuickSmart* students**

The results of this analysis show that, on average, schools can expect an approximate improvement on statewide test scores of 10% (or about 3.5 points) from *QuickSmart* students during the first year of the program. During the second and subsequent years of implementing *QuickSmart*, average student improvement can be of the order of 20% (or up to 7 points on the NT MAP test). Figure E.3 derived from improvement scores obtained by established schools in the Northern Territory depicts substantial improvement in terms of students' scores over the first year of the program and then more pronounced and subsequently stable growth once the program is established. These data give encouragement to schools to continue the program.

The second analysis, Figure E.4 records the results graphically, concerns 20 students who continued in the program for a second year.



**Figure E.4: *QuickSmart* student data for two-year intervention group, 2006-2007**

Schools were not encouraged to attempt this and it was only through working with the NT data base that Mr John Bradbury noticed that this had occurred in a small number of cases. Of interest in this figure is that students continue to consolidate ideas over the Christmas vacation and that their growth (slope of line) in the second year is comparable to that in their first year on *QuickSmart* and, significantly, that the growth is cumulative. Also significant is that despite the Comparison group's results in 2007 being very much higher than the *QuickSmart* cohort's results, these two-timers were able to move beyond this group.

Overall, the analyses undertaken in 2007 confirmed the significant gains identified in 2006 and provide additional insights into the efficacy of the *QuickSmart* intervention.

### **Northern Territory 2008 *QuickSmart* Results**

The discussion in this section is adapted from the recently released *Preliminary Report of the 2008 QuickSmart Intervention results in the Northern Territory*. Mr John Bradbury and Ms Joanne Jefferson (Teaching, Learning and Standards Division) prepared the 2008 report – please refer to Appendix 30 for the full report.

The above-mentioned report is termed 'preliminary' as it is envisaged that a series of more comprehensive studies, such as a question by question analysis of Indigenous and non-Indigenous growth, a cross section of school case studies, statistically combining data from previous years, and effects on MAP achievement, will follow.

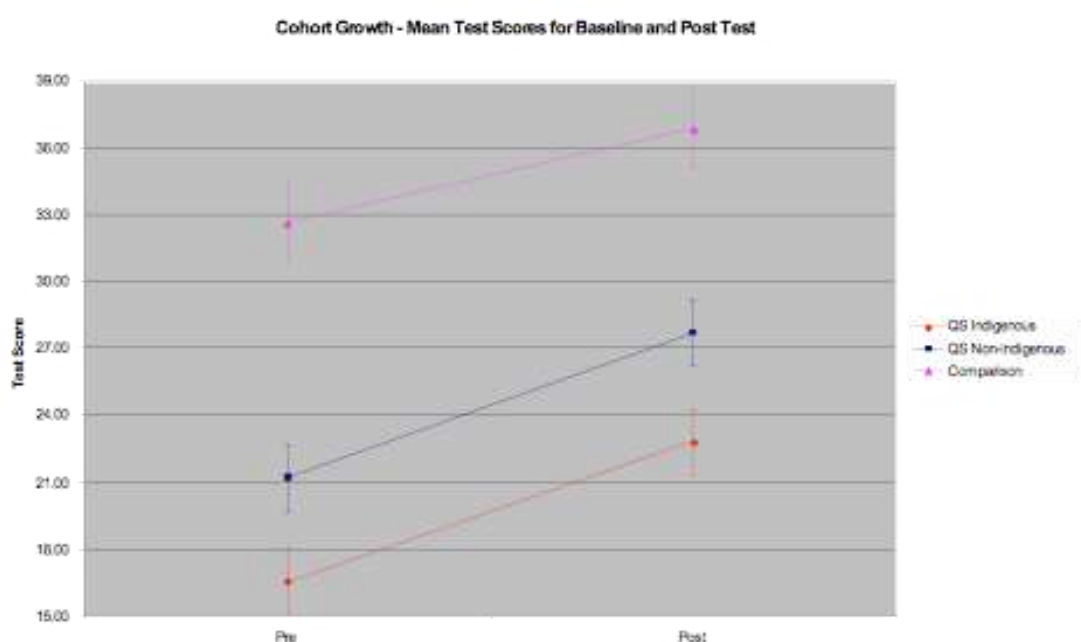
Only paired data sets have been used in the analysis of the test results to ensure reliability. The baseline and post test papers were identical and were each scored on 53 items. Significance of growth within cohorts was determined by paired two-sample t-tests for means while comparisons of growth between cohorts were tested using two-sample t-tests assuming equal variance.



effect size (ES) calculations were based on Cohen's  $d$ , although as only paired data were used, the calculation was also identical to Hedge's  $g$ . The Standard Deviation value used in effect size calculations was based on the raw data rather than on the paired  $t$ -test value (as suggested by Dunlop et al.). ES confidence intervals were calculated using a dependant sample formula suggested by Becker (1988), while the formula for the corresponding  $z$  test was taken from Lambert and Flowers (1998).

Paired data were collected from 216 *QuickSmart* students and 86 comparison students from a total of 21 schools. An examination of the baseline and post-test scores of students in the *QuickSmart* cohort revealed a strong positive change in test performance. A paired Student's  $t$ -test confirmed that this gain was highly significant ( $p = 4.65 \times 10^{-30}$ ). The comparison cohort also demonstrated a significantly positive change ( $p = 2.27 \times 10^{-12}$ ).

While both cohorts exhibited an overall positive change in scores from baseline to post-test, a closer examination of results indicated stronger growth by students from the *QuickSmart* cohort. An analysis of the relative growth between the cohorts using an unpaired Student's  $t$ -test confirmed this difference as significant ( $p = 4.54 \times 10^{-3}$ ). Further confirmation of this differential growth was provided as the relative ES of the cohorts ( $0.78 \pm 0.07$  for *QuickSmart* group and  $0.51 \pm 0.07$  for the comparison group) also proved significantly different ( $p = 0.0029$ ). This is illustrated in Figure E.5.



**Figure E.5: Pre- and post-Intervention Indigenous and non-Indigenous *QuickSmart* and Comparison group data for 2008**

This result indicates that the program has been successful in that the *QuickSmart* cohort grew at a greater rate than the comparison cohort. This is particularly notable as the comparison group this year (2008) performed very strongly on the baseline test and also demonstrated the strongest growth of any comparison group to date. It is reasonable to suppose that these students are successfully engaged in classroom programs and are able to access this instruction effectively.

Although the results indicate a narrowing of the gap between cohorts, the difference between the means of the cohorts clearly remains significant at post-test. Previous years' results have shown a much closer narrowing of the gap at post-test. To investigate further, the *QuickSmart* cohort was divided into Indigenous and non-Indigenous results.

As in previous years, there is a strong similarity in the pattern of growth between the Indigenous and non-Indigenous *QuickSmart* results. A *t*-test confirms that there is no significant difference in the growth between these cohorts ( $p = 0.41$ ), indicating that the program has been just as effective with Indigenous students as with non-Indigenous students. Analysis of the relative effect sizes (see below) confirmed that the two results were statistically indistinguishable ( $p = 0.2119$ ).

This does not explain why the gap is so pronounced, however. Both *QuickSmart* Indigenous and non-Indigenous groups show a strong ES of  $0.76 \pm 0.09$  and  $0.88 \pm 0.12$ , respectively, well in line with previous years' results (e.g., ES was 0.51 and 0.81, respectively in 2007). A comparison of the 2008 results with the results from two previous years reveals some interesting similarities and differences. Firstly, the confidence intervals of the means have become tighter over the years as the number of students in the study has grown.

In addition, the baseline results of both the Indigenous and non-Indigenous *QuickSmart* cohort have declined from around 20 and 24 in 2006 to 16 and 21 respectively in 2008. This is probably due to the greater proportion of remote schools now included in the program (i.e., 10 schools out of 21 school data sets were collected) although this conjecture remains to be tested.

Finally, the comparison baseline result has increased from around 28 schools in 2006 and 2007 to almost 33 in 2008, with the comparison ES also rising from around 0.31 in 2007 to 0.51 this year. This could be due to many of the more remote and new schools failing to provide paired data for a comparison group, allowing the urban comparison results to be more strongly expressed (but again, this remains to be tested).

Reassuringly, growth for the both Indigenous and non-Indigenous *QuickSmart* students has remained strong and has been consistently greater than that of the comparison cohort for each year of the study.

The results are summarised in Table E.1 below.

**Table E.1: Overall Effect Size Results for the Northern Territory in 2008**

	Effect Size	Confidence Interval	Significance (wrt Comparison)
<i>QuickSmart</i> – All	0.78	$\pm 0.07$	$p = 0.0029$
<i>QuickSmart</i> – Indigenous	0.76	$\pm 0.09$	$p = 0.0174$
<i>QuickSmart</i> – Non-Indigenous	0.88	$\pm 0.12$	$p = 0.0033$
Comparison	0.51	$\pm 0.07$	

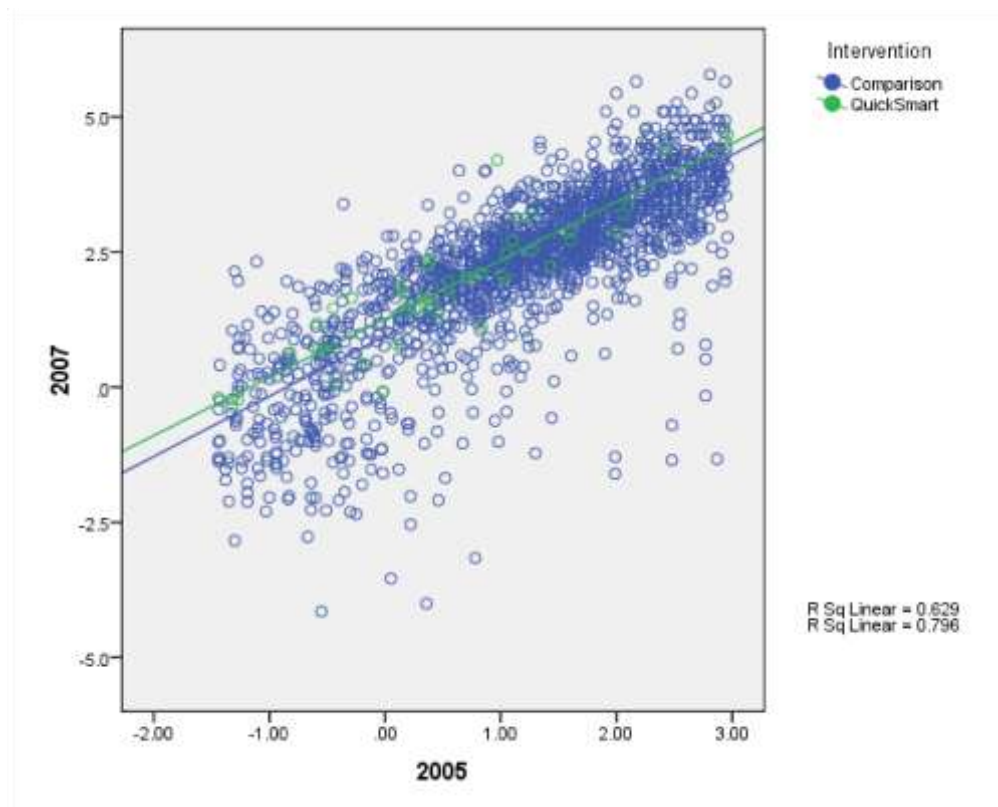
Despite an increase in the measured ES of the comparison cohort in 2008, both Indigenous and non-Indigenous divisions of the *QuickSmart* cohort continued to demonstrate significantly greater growth compared with students who have not received intervention.

## Results of Northern Territory Longitudinal Research

Initial attempts have been undertaken by Mr John Bradbury to consider if he could capture statistically the anecdotal evidence that the *QuickSmart* student results were beginning to be felt in the State-wide MAP test. His attempt to undertake this analysis is offered in Figure E.6 below.

He found that the effect sizes for those students who had undertaken *QuickSmart* between the 2005 and 2007 state test were significantly different ( $p = 0.036$ ), with the average *QuickSmart* student logit gain (vs no intervention gain) of 0.297. The implication here is that the *QuickSmart* students and Comparison students (being all the rest of the students in the NT) were significantly different from one another.

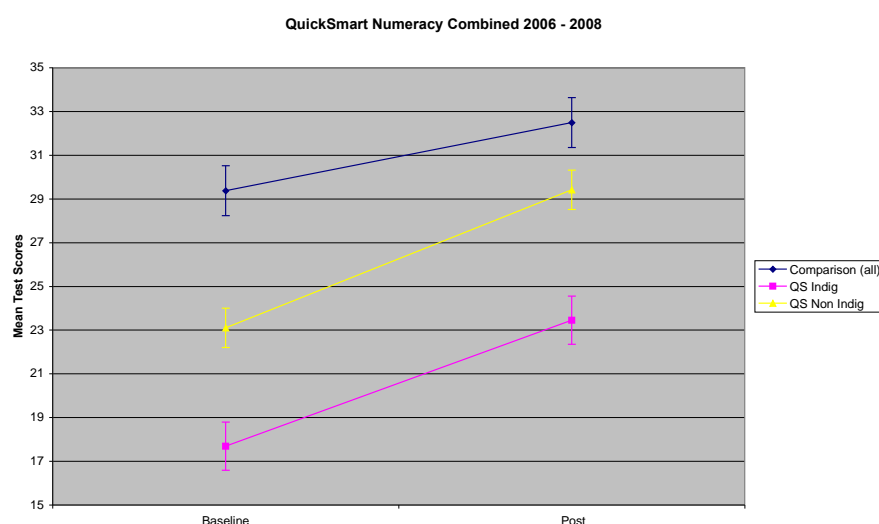
He also stated that it is “Interesting to note the initially poor-achieving comparison students who actually go backwards (in real terms over the two years) at the lower end of the graph.”



**Figure E.6: Comparison of *QuickSmart* students with Territory results between 2005-2007**

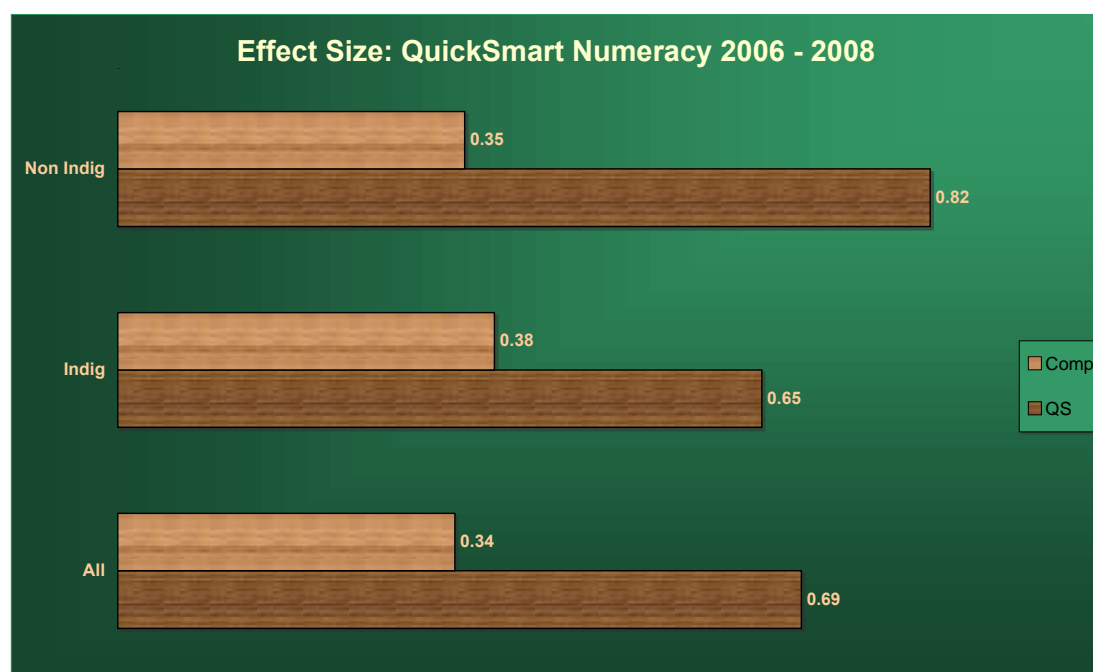
## Overall Results of Northern Territory 2006-2008

In May 2009, Mr John Bradbury and Ms Joanne Jefferson of NT DET undertook an analysis of all paired data collected from Northern Territory schools involved in *QuickSmart* from 2006 to 2008. The results are provided graphically below in Figures E.7 and E.8.



**Figure E.7: Combined Results 2006 –2008 *QuickSmart* Numeracy program**

There were 526 students in *QuickSmart* and 249 comparison students who completed pre- and post-MAP tests over the period.



**Figure E.8: Combined Results 2006 –2008 *QuickSmart* Numeracy program, Effect Sizes**

The results in Figure E.7 illustrate that over the three years of which substantive data has been collected on *QuickSmart* Numeracy in the Northern Territory there has been

substantial growth on a state-wide test. Also observable is that despite the Indigenous *QuickSmart* students starting at a particularly low level on the MAP test the growth (gains) are similar to the growth experienced by the non-Indigenous students. In both cases, however, students enrolled in the *QuickSmart* program have “narrowed the gap”.

In Figure E.8 the results show the Effect Sizes for the different cohorts of students. In Table E.2 below a summary of the numbers of students in each cohort, upon which the analysis was undertaken, is provided.

**Table E.2 Numbers of *QuickSmart* and Comparison cohort students with paired data from 2006 – 2008 in the NT**

	Numbers of Non-Indigenous students	Numbers of Indigenous students	Total numbers of students
<i>QuickSmart</i> Cohort	268	258	526
Comparison Cohort	167	82	249

There are at least four significant features to be found in the data in Figure E.8. Firstly, the average effect size for the average-performing comparison group lies within the traditional range of 0.2 to 0.4 as suggested by Hattie (2009). Secondly, the effect size of the *QuickSmart* students is significantly above the Comparison group, representing on average a two-to-three year growth by these students. Thirdly, these results represent a possible minimum effect as they include new schools that started the program in either 2006, 2007 or 2008 where the improvements, while significant, are below those to be expected in the second and subsequent years. Finally, these results also represent a possible minimum as the attendance data have not been applied to the results.

This last point means that the analysis data was carried out on all students who had paired (pre- and post-test scores) and does not distinguish among those students who may have been regular attenders and those who may have been less regular in their attendance or who might have been in a school which offered less than thirty weeks’ instruction.

These results are impressive and give further empirical backing to the reference by Ms Debbie Efthymiades, General Manager, Strategic Executive Services, Northern Territory Department of Education and Training, when she stated:

Improvements in student achievement results through the *QuickSmart* program have continued to be outstanding throughout the five-year expansion including the clear improvement in Year 5 and Year 7 numeracy results in the inaugural 2008 National Assessment Program Literacy and Numeracy (NAPLAN) tests. Of particular note, the numeracy results for the NT exceeded literacy results at these year levels for the first time in history. The connections to the *QuickSmart* program are both valid and strong as a major contributing factor for these improved results.

The improvements noted above have been realised despite increasing numbers of students with even lower levels of numeracy entering the program and continuing to improve at the same rate as previous cohorts.

## **Orara High School (North Coast Region, NSW) 2005/2006 *QuickSmart* Results**

The following summary of the 2005/2006 *QuickSmart* intervention results at Orara High School is an extract from a report prepared by Ms Lyn Alder (Support Teacher Learning Assistance, Orara High School). Please refer to the full report in Appendix 31.

Orara High School is a comprehensive Year 7 to Year 12 public school located in Coffs Harbour on the Mid-North Coast of New South Wales. It is one of two public high schools in the town. Of the 650 students enrolled at Orara High School, approximately fifteen percent come from family backgrounds where the parents are unemployed and eleven percent of the school population identifies as Aboriginal or Torres Strait Islander. The school also includes a number of refugee students from Sudan and neighbouring African countries. The school receives Priority Schools Program funding and employs one full-time Learning Support Teacher.

Orara High School students' state-wide test results on the Secondary Numeracy Assessment Program (SNAP) have consistently been significantly below the state and regional averages. In 2005, when the school was first funded through the Priority Schools Program, the decision was made to address the numeracy problems of Year 7 and Year 8 students; with this aim in mind, the *QuickSmart* numeracy program was implemented at Orara High School in July 2005. This section of the report focuses on the achievement of a cohort of sixty-seven low-achieving Year 7 students who participated in the program during 2006.

The student selection at Orara High School was based on information from primary feeder schools, class teacher assessments and results on the Progressive Achievement Tests in Mathematics (ACER, 2005) and Comprehension (ACER, 2001). Based on these criteria, sixty-seven of the 116 (67%) students beginning Year 7 were included in the program.

These students scored results in Stanine 1, 2 or 3 of the Progressive Achievement Tests (PAT) on the PAT 4 Mathematics test. PAT-R Comprehension tests were administered to assess students' key reading skills, which were also of interest and can be seen as underpinning students' understanding of mathematical problem-solving.

The Support Teacher (Learning) supervised the implementation of the *QuickSmart* Program at Orara High School. Using a combination of funding sources, three full-time teacher aides were employed to provide instruction throughout the program. *QuickSmart* lessons were presented in a classroom equipped with five computers and a series of working spaces for instructors and pairs of students.

Communication with class teachers, particularly those in the Mathematics faculty, was carefully maintained and monitored. Interested teachers were included in the



professional development workshops offered on three occasions as part of the *QuickSmart* program throughout 2006.

Results from Orara High School were positive with regard to students' performance on the PAT standardised test, class performance, state-wide testing and in terms of the recognition of the value of the program within the school and the wider educational community.

Students were retested on the relevant Progressive Achievement Test in Mathematics and in Comprehension in November 2006. Of the sixty-seven students who began the program with Stanine scores of 1, 2, or 3 on the Mathematics test, thirty-nine (58%) finished the program with scores of Stanine 4 or above. These results indicate impressive gains on standardised tests within a period of ten months.

Of the 28 remaining students who did not reach the level of Stanine 4 or above, eight students have a diagnosed mild intellectual disability (IM), ten students were absent for significant amounts of time during the year, and two students left the school for terms two and three, but returned at the end of Term 4.

The IM students improved on the CAAS computer system and achieved 100% on the four basic operations, but did not show improvement on the problem-solving aspects of the PAT assessments. This is consistent with what can be expected of students with intellectual disabilities.

Of the 12 Aboriginal and Torres Strait Islander students included in this group, eight students (58%) showed improvement on standardised measures. Five students who had patterns of regular school attendance showed noticeable gains at the end of the *QuickSmart* program. The students who were consistently absent from school were identified as primarily the younger siblings of students who had been expelled from Orara High School.

The administration of Orara High School arranged for students to take the state-wide SNAP assessments in Year 7 and again in Year 8. This re-administration of the SNAP is optional for schools. A cohort of students who completed the SNAP assessments in Year 8 had taken part in the *QuickSmart* project in Year 7 during 2005, so their results are of interest to this report on the impact of *QuickSmart* on Orara High School students.

The results of the SNAP assessments are compelling. For the first time Orara High School was placed first in the Coffs Harbour/Clarence region in terms of value adding for students in Numeracy. The school was placed ninth overall in the North Coast Region on SNAP results. Table E.3 below shows the Orara High School results compared to State and School Education Group averages.

**Table E.3: SNAP Numeracy Results for Orara High School (2006)**

Student Group	Orara High School SNAP Numeracy Results (2006)	State SNAP Numeracy Results (2006)	Local School Education Group SNAP Numeracy Results (2006)
All	2.83	2.44	2.43
ATSI	1.31	1.10	0.99
Effect Size	0.30	0.24	NA



The results of the *QuickSmart* program at Orara High School have brought with them attention from the Director General of the Department of Education and Training, Andrew Cappie-Wood and the Assistant Director General, Trevor Fletcher. Both these educators spent time at the school observing the *QuickSmart* program in action during 2006.

As a result, there is NSW DET support for the final recommendation of this report that the *QuickSmart* project be extended. Also, an informative article by Kim Cotton about the project appeared in the November issue of *Side-by-Side* (please refer to Appendix 31 for a copy of the article). Of relevance here are the first two paragraphs (p.5) of this article:

It's not often that a school records a meteoric rise in student performance over a single year. So when Orara High School recorded the highest growth in its history for Year 8 literacy and numeracy, the principal, Graham Mosey, summed it up in three words: "We were thrilled!"

Last year almost half of the school's Year 7 cohort was under the national benchmark for literacy and numeracy. But in 2006, all of the students, now in Year 8, performed above the benchmarks – almost doubling the state average growth in their English Language and Literacy Assessment results, and more than doubling the state average growth in writing. Similar results were brought home for the Secondary Numeracy Assessment Program.

The article concludes with a comment from Mr Rod Jones, then Deputy Principal at Orara High School and now Principal at Gunnedah High School:

"Students are coming back into class a lot more enthusiastic and willing to take risks with their classroom activities," Mr Jones said. "They're showing a lot more confidence within themselves, sharing ideas with other students in the class, enjoying their learning and have a lot of success."

Within the school, Year 7 teachers organised '*QuickSmart* Awards' which were presented at the school's end-of-year Celebration of Learning day. This was done independently of the Support Teacher (Learning) and is an encouraging indication of how Orara High School embedded *QuickSmart* into their school culture.

In summary, for 2005-2006 the Effect Size of student growth for the school was 0.30, and this compared favourably with the NSW State Effect Size for that year of 0.24.

## **Orara High School (North Coast Region, NSW) 2006/2007 *QuickSmart* Results**

In 2006, 68 students undertook *QuickSmart* in Year 7. When the students were in Year 8 (in 2007) they undertook the state-wide SNAP test. This provided data on the

growth of students over the period of their involvement in *QuickSmart*. Table E.4 summarises the results.

**Table E.4: SNAP Numeracy Effect Size Results for Orara High School and NSW State (2007)**

Student Group	Orara High School SNAP Effect Size (2007)	NSW State SNAP Effect Size (2007)
<i>QS</i> non-Indigenous students	0.55	–
<i>QS</i> Indigenous students	0.56	–
Non- <i>QS</i> Indigenous students	–	0.26
Non- <i>QS</i> students	0.49	0.30

The data shown above and reported as effect sizes are impressive for several reasons. There has been a further significant improvement from the results of the 2005-2006 Orara cohort, of which much has already been written and acclaimed.

The *QuickSmart* student Effect Size of **0.55** and **0.56** is important given that this includes all students who were enrolled in *QuickSmart* at Orara High and does not remove those students who had poor attendance. Also, traditionally the *QuickSmart* students (i.e., those below benchmark) are those students that historically have the lowest Effect Size scores.

The *QuickSmart* Indigenous students' Effect Size is more than double the State Effect Size for Indigenous students (i.e., **0.56** as opposed to **0.26**).

The strong result (**0.49**) for the average and above average students not in the *QuickSmart* program highlights the important work being carried out by the Mathematics Faculty at Orara High School. In addition, the *QuickSmart* students' growth also means the Mathematics Teachers at Orara High School have been able to build on the gains and confidence created in students in the *QuickSmart* sessions.

The further improvement over 2005-2006 data probably mirrors further experience with teaching the *QuickSmart* program in the school and is also likely a result from the fact that the program was run for 30 weeks in 2007 as opposed to 18 weeks in 2005-2006.

### **Orara High School: Two-Year Study of Effects of *QuickSmart* Program on Student Academic Performance**

The following extract is adapted from the Executive Summary of a report entitled *Longitudinal evaluation of student-learning outcomes associated with QuickSmart in Year 7 in 2006 at Orara High School*, written by Lyn Alder. Please refer to Appendix 32 for the full report.

The release of the National Assessment Data – Literacy and Numeracy (NAPLAN) data for Orara High School has meant that the analysis of data of students who have participated in the *QuickSmart* (*QS*) program can be extended to consider the impact of the program over an extended period on state/national testing initiatives. The

purpose of this work is two-fold: firstly to build on the strong empirical basis already established at Orara High School concerning *QS* that showed that at the end of the program students had shown considerable growth; and secondly to further investigate the substantial (and often informal) qualitative data from Orara High School that students that have participated in the *QS* program continue to grow in their learning years after they have exited the program.

The main report is in three sections that discuss:

- 41 *QS* students who were below benchmark in Year 7,
- 27 *QS* students who were slightly above benchmark in Year 7 and
- the performance of the 68 *QS* students in comparison to 58 non-*QS* average-to-high-achieving peers at Orara High School.

Of the 68 students who undertook *QS* in Year 7 in 2006 there exists matched data for 44 *QS* students on the Year 7 Secondary Numeracy Assessment Program (SNAP) test and NAPLAN test of Year 9 in 2008 and there are also matched data on the 58 non-*QS* students. This report is about the description and analysis of the long-term performance of these students.

In 2006, 41 Year 7 students were below the national benchmark for numeracy as indicated by the SNAP data. In 2008 only 2 former *QS* students were below benchmark in Year 9 as indicated by 2008 NAPLAN results. The results were: 2 students attained Band 5 (considered below benchmark in NAPLAN for Year 9); 14 students attained Band 6; 8 students attained Band 7; 2 students attained Band 8; 3 students were absent for the NAPLAN test; and the remaining 12 former *QS* students had left the school since 2006. The two former *QS* students who were below benchmark were identified as diagnosed with mild intellectual disabilities (IM). However, over the two years both students made above average improvement.

In 2006, 27 students who were slightly above benchmark but performed poorly on the ACER PAT 4 Numeracy in Year 7 or were identified as not strong by classroom teachers also participated in the *QS* program whilst in Year 7. Prior to their *QS* participation, their SNAP test results were as follows: 7 students attained Elementary Band; 19 students attained Proficient Band, and 1 student was absent for the test. The results for this cohort on the Year 9 NAPLAN test were: 1 student attained Band 5 (under benchmark); 3 students attained Band 6; 8 students attained Band 7; 4 students attained Band 8; 2 students attained Band 9; 2 students left the school; and 7 students were absent for the test.

The calculation of Effect Sizes reveals a strong trend that can be attributed to the *QS* program. For the 44 students with matched data the Effect Size over the two-year period was 1.03 and for the Indigenous students the Effect Size was 0.89. This compares to an Effect Size of 0.55 for the average and above-average students at Orara High School who did not participate in the *QS* program, and a plausible estimated Effect Size of 0.56 for all students in NSW.

The *QS* students whose results were analysed in this sample from either group received no numeracy intervention other than the original *QS* program in Year 7. This suggests that even after 18 months of no further intervention, *QS* students have

continued to build on their basic skills in numeracy and to transfer this learning into Stage 4 and 5 outcomes. These data show that, based on performances on NAPLAN, only 2 students regressed over the two-year period. All other students made improvements. More than half of these students' ( $n=26$ ) growth was in excess of the state average, with eight students reaching Band 8 or above.

The significance of this impressive result is that it suggests that once low-achieving students have the chance to enter the main game of schooling through an intensive instructional program such as *QS* there are no limits to what is possible given the students' willingness to work at their studies and the ability of their classroom teacher to provide a rich and appropriate learning environment.

Finally, these data also show convincingly that the *QuickSmart* program was able to narrow the gap between the low-performing students and the average-achieving students, thus offering an alternative data-base to what is evident from national data which reports that low-achieving students (i.e., those at or below Benchmark), in general, do not improve. In fact the national data report, over the period since national data have been collected, that there is minimal improvement in the outcomes of low-achieving students but that the ranks of those students below benchmark swell as students who were slightly higher on the scale join their lower-achieving peers over time. These data can be summarised by Table E.5.

**Table E.5: Orara High Paired Data on SNAP in 2006 and NAPLAN in 2008**

Of the 44 *QuickSmart* Orara students of which there are paired data:

42	students were above Year 9 Benchmarks
26	students received above state average improvement
2	students fell back over the period (but not below Benchmark)
8	students received Band 8 (6 students) or Band 9 (2 students)
2	students remained below Benchmark (both diagnosed IM), but both achieved above state average growth

## North Coast Region (NSW) *QuickSmart* Results

This sub-section considers the results of the *QuickSmart* intervention program on a cluster of schools in the mid-north coast area of NSW for the years 2007 and 2008.

### North Coast Region (NSW) *QuickSmart* Results for 2007

In 2007 *QuickSmart* was introduced to a small cluster of schools in the North Coast Region of NSW. The schools were Bowraville Central School, William Bayldon Primary School, Tyalla Primary School, Sawtell Primary School, Toormina High School, and Coffs Harbour High School. These six schools joined Orara High School, which had been implementing *QuickSmart* since 2005.

The total number of students in the *QuickSmart* program in the North Coast Region in 2007 was 142, and schools had selected a comparison cohort of 39. Overall results

using effect size on standardised PATM tests for 2007 for the seven North Coast Region schools were: 0.75 for *QuickSmart* students and 0.19 for the Comparison group of students.

## North Coast Region (NSW) *QuickSmart* Interim Results for 2008

The following extract is adapted from the Executive Summary of a report written by Ms Lyn Alder. Please refer to Appendix 33 for the full report.

There are currently 16 schools in the North Coast Region using the *QuickSmart* (QS) program. Data were submitted in 2008 for 274 students who participated in the *QuickSmart* project. Of these, 186 were *QuickSmart* participants (including 52 Indigenous participants) and 36 were comparison students.

The breakdown of student numbers based on data to hand by 22nd December 2008 is shown in Table E.6 below.

**Table E.6: Number of *QuickSmart*, Indigenous and Comparison Students**

School	Number of Students
High School 1*	3 QS, including 3 Indigenous and 0 valid comparison students
Central School 1	27 QS, including 7 Indigenous and 3 valid comparison students
High School 2	49 QS, including 4 Indigenous and 5 valid comparison students
High School 3	35 QS, including 14 Indigenous and 5 valid comparison students
Primary School 1	8 QS and 8 valid comparison students
Primary School 2	20 QS, including 5 Indigenous and 6 valid comparison students
Primary School 3	33 QS, including 14 Indigenous and 4 valid comparison students
Primary School 4	11 QS, including 5 Indigenous and 5 valid comparison students

Students were selected from Years 4, 5, 6, 7, 8 and 9. Generally, students who were underachieving in mathematics were chosen for the *QuickSmart* cohort while average-achieving students were selected for the comparison cohort. Most *QuickSmart* students at High School 1 are not included as they have not completed 30 weeks of the program.

All students underwent a pre- and post-test assessment on the Progressive Achievement Test (PAT) in numeracy. This test is a norm referenced, standardised test produced by the Australian Council of Educational Research. Each school bought the appropriate grade test for their cohort of students. Quantitative data was obtained through the administration of baseline (pre-intervention) and post (post-intervention) tests. Collecting the National Assessment Data – Literacy and Numeracy (NAPLAN) data on students from the 2007 QS cohort was challenging due to difficulties associated with accessing data from individual schools.

All schools were used to calculate the effect size for the North Coast Region *QuickSmart* and comparison group students, and the results are summarised below:

The effect size for the North Coast Region *QuickSmart* students for 2008 is 0.809 whilst the comparison group had an effect size of 0.413.

The Indigenous *QuickSmart* students within the North Coast Schools had an effect size of 0.859. This represents a further improvement from 2007 when the Effect Size for the North Coast region *QuickSmart* students was 0.75 and the effect size of the Comparison Group was 0.19.

We are able to calculate the effect size on individual schools whose participant numbers were greater than 20 students; these effect sizes are:

- High School 3            1.19
- Central School 1        0.78
- High School 2            0.69
- Primary School 2        0.65
- Primary School 3        0.78
- Primary School 4        1.24

For those schools with reasonable numbers of Indigenous students in *QuickSmart*, the effect size for the Indigenous *QuickSmart* students were:

- High School 3            1.04
- Primary School 3        1.29

These effect sizes represent impressive and considerable academic growth for these children. Given that expected growth should be in the range of 0.2 to 0.4, these results represent more than two and three years' growth on average for the 30-week *QuickSmart* Program. This indicates that the *QuickSmart* intervention program does narrow the performance gap between low-achieving students and their average-achieving peers.

Evidence exists that these students will continue to grow as they enrol in further years of study and the gains they have made are likely to be maintained after exiting the program (please refer to Alder's (2008) report, *Longitudinal evaluation of student-learning outcomes associated with QuickSmart in Year 7 in 2006 at Orara High School*, in Appendix 33).

Responses were received from various stakeholders that this program was often the only program in numeracy that was having any effect on these low-achieving students and offering them an alternative to failure. In addition to the compelling quantitative data, all schools reported strongly supportive qualitative data with comments from students, parents, teachers, and principals. It is important that these voices are heard, and that the *QuickSmart* program is used optimally to address the learning needs of these and other students who are not currently achieving benchmarks.

With the above in mind, a cluster supervisor of *QuickSmart* was seconded for two days a week to conduct *QuickSmart* training in new schools and in assisting aides in their understanding of numeracy strategies, and monitoring the *QuickSmart* program already running within each school system. She was invited to speak at the NSW Principals' Secondary Conference and The Australian Special Education Conference,



and organised a Principals' Forum on the impact of *QuickSmart* on the North Coast Region schools and, in particular, on High School 3.

## **An NT School of the Air (Northern Territory) *QuickSmart* Trial Report**

The following report was developed from a presentation prepared and delivered by Ms Sally Mackander (ESL/ESD Co-ordinator) of an NT School of the Air at the *First International Symposium for Innovation in Rural Education (ISFIRE)*. The presentation provided a brief overview of the outcomes of the trial project involving teaching the *QuickSmart* program using distance delivery modes. Please refer to Appendix 38 for a copy of the presentation.

An NT School of the Air trialled the *QuickSmart* Numeracy program over a period of 26 weeks in 2008. Some of the *QuickSmart* resources, and the way the program was taught, had to be modified to suit the distance-learning mode. For example, instead of being taught for three half-hour face-to-face sessions each week, the *QuickSmart* program was taught in three different modes:

- Home tutors taught the program for 30 minutes three times a week;
- The school based tutor taught the program for 20 minutes daily by telephone (with students completing speed sheet and CAAS exercises after the lesson); or
- Teaching occurred over IDL using Return Path Video lessons for 20 minutes twice per week.

Having begun with 15 students on 8 sites, by the end of the 26 weeks there were 10 students on 6 sites due to a variety of challenges, for example, geographical remoteness, home tutors, telephone lines not working, and delays in main delivery.

Teaching *QuickSmart* via telephone involved the school-based tutor reviewing the focus facts with students, then completing the flash card exercises and the speed sheets with the home tutors overseeing the completion of the speed sheets. The students graphed their speed sheet results and then completed their CAAS tasks. *QuickSmart* lessons via Return Path Video followed the standard *QuickSmart* lesson format.

The Multilevel Assessment Program (MAP) results of the majority of the students who completed the *QuickSmart* program improved. Some students moved up a whole band with reference to their MAP results from the beginning of the year (before their participation in the *QuickSmart* program). Tutors also reported that these students were more willing to take risks in their learning and displayed increased confidence to participate in other learning areas. The *QuickSmart* students also demonstrated persistence in learning to read, in discussions, and in trying other mathematics problems. In general, the *QuickSmart* students demonstrated greater resilience and seemed to have an increased sense of self-worth. They also challenged themselves by continually taking ownership over the way the program was being taught.

The following selection of student comments about the *QuickSmart* program illustrate their enthusiasm for it:



QuickSmart has helped me with my maths. I am getting better at my times tables and subtraction questions.

QuickSmart has helped me outside in the cattle yards by adding cows together.

Adding larger numbers outside of school.

I enjoy it!

I'm the king of this!

I can do this!

Go! Let's go!

I'll try this.

Feedback given by parents and tutors has also been very positive, as the following selection of comments illustrate:

The student's developmental changes are immeasurable.

Automatic recall has improved.

My student's attitude has improved and self-confidence has increased.

It is time consuming but the results are worth it.

Willing to do maths due to more understanding of the subject.

My student has improved with self-confidence, self-esteem and behaviour.

She is more willing to do her work by herself and complete it.

Should be introduced to early childhood as soon as possible. Over all going very well.

I believe this it will benefit the Indigenous students greatly.

It has impacted positively because of their abilities to recall maths facts quickly.

Student's attitude has improved because they are more confident and enjoy maths because of this.

It is easy to organise with clear goal with what is supposed to be achieved.

QuickSmart is a great program that every child should participate in.

When it comes to QuickSmart, he is happy to do this subject he finds it fun and comes away with good feelings.

The different challenges helped my student's competitive nature to improve

Teacher feedback was also very positive, as illustrated by the following comments:

QuickSmart has provided an awesome opportunity for identified struggling students to make great leaps to reach their full potential.

Positivity is a consequence!

Some transferring of knowledge into other KLA's.

Improved attitude towards his work. He is having a go and trusting himself.

Self-esteem has improved. He can admit he is getting better.

It has built a safe environment for particular students.

Built relationships teacher/peers.

School is embracing the changes.

Students have improved perception of themselves and their learning.

**IT REALLY WORKS!!!!**

Very positive students have improved not only in maths but are willing to challenge themselves in other areas of learning.

I am enjoying seeing the progress in my students.

Given the promising results of the trial, the NT School of the Air (KSA) decided to continue offering the *QuickSmart* Numeracy program in 2009. At the time this presentation was given, KSA estimated that it would have up to 20 students with at least five home tutors teaching the *QuickSmart* program in 2009, using the three different distance learning/teaching modes again.

## **New England Region (NSW) Interim *QuickSmart* Results**

During 2008, Department of Education, Employment and Workplace Relations (DEEWR) funding supported the *QuickSmart* numeracy program in ten New England Region schools. The funding became available to schools from the beginning of Term 3 in July 2008, which is when the schools commenced with implementing the *QuickSmart* program. The results of the intervention reported here are thus for approximately half of the total number of instructional sessions that will be made available to students included in this *QuickSmart* project.

It should be noted that one of the ten schools, School 1 (ACPS), completed the full thirty-week *QuickSmart* program in 2008. ACPS has implemented *QuickSmart* since 2006 and had begun the *QuickSmart* program early in Term 1 of 2008.

The schools that took part in the New England *QuickSmart* Numeracy project in 2008 are shown in Table E.7. Of these ten schools, five (School 3, School 4, School 5, School 9, and School 10) were new to the program in 2008. Four of the remaining schools (School 2, School 6, School 7, and School 8) had been introduced to *QuickSmart* during 2007. As already noted, School 1 began working with the *QuickSmart* team at the University of New England in 2006.

**Table E.7: School ID Key For DEEWR New England PSPI *QuickSmart* Project**

SCHOOL ID	SCHOOL NAME
S1	School 1 (Public)
S2	School 2 (High)

S3	School 3 (Central)
S4	School 4 (Public )
S5	School 5 (Public)
S6	School 6 (Public)
S7	School 7 (Public)
S8	School 8 (High)
S9	School 9 (High)
S10	School 10 (Public)

Students were selected to take part in the *QuickSmart* program based on their need for support in order to improve their basic numeracy skills and on their consistent patterns of attendance at school. In total, 186 low-achieving students, 96 females and 90 males, participated in *QuickSmart* lessons across the ten New England schools. Their results were compared to those attained by 67 comparison students from the same schools. Therefore, the grand total of participating students for this project was 253. Of the 186 *QuickSmart* students, 125 were identified as Indigenous students. The composition of *QuickSmart* students across the participating schools is shown in Table E.8.

In total, 14 Year 4 students, 47 Year 5 students, 43 Year 6 Students, 45 Year 7 students and 36 Year 8 students participated in *QuickSmart* lessons during this project (the year level of one of the students was not provided in data sent by the school).

**Table E.8: Summary Data for New England Region *QuickSmart* Schools (2008)**

School	QS	F QS	M QS	IN QS	NESB QS	Comp	Total	Y4 QS	Y5 QS	Y6 QS	Y7 QS	Y8 QS
S1	16	10	6	15	1	7	23	5	8	3	0	0
S2	31	16	15	17	2	6	37	0	0	0	14	17
S3	19	10	9	18	0	2	21	0	1	3	7	8
S4	26	12	14	13	0	7	33	9	6	11	0	0
S5	17	9	8	12	0	8	25	0	6	11	0	0
S6	15	5	10	15	0	5	20	0	15	0	0	0
S7	14	10	4	8	0	10	24	0	6	8	0	0
S8	14	6	8	7	0	5	19	0	0	0	14	0
S9	13	8	5	4	0	12	25	0	5	7	0	0
S10	21	10	11	16	0	5	26	0	0	0	10	11
TOTAL	186	96	90	125	3	67	253	14	47	43	45	36

KEY

QS – Number of *QuickSmart* participants in the numeracy program

F – Number of female *QuickSmart* students

M – Number of male *QuickSmart* students

IND – Number of Indigenous students participating in the *QuickSmart* program

NESB – Number of students from a non-English speaking background participating in the *QuickSmart* program

Comp – Number of Comparison students

Total– Number of all students participating in the research (QS + Comparison)

Y4 – Number of Year 4 QS students

Y5 – Number of Year 5 QS students

Y6 – Number of Year 6 QS students

Y7 – Number of Year 7 QS students

Y8 – Number of Year 8 QS students

Data were collected from *QuickSmart* and comparison students on both a standardised assessment of mathematics achievement, specifically the Progressive Achievement Tests (ACER, 2005), as well as from the CAAS computer software that measures students' response speed and accuracy. Assessments were conducted before the intervention began in July/August 2008 and then again in late November 2008. This means that for all schools except School 1, which began *QuickSmart* early in Term 1, the second assessment occurred half way through the intended length of the numeracy program. *QuickSmart* will continue into 2009 for all schools except ACPS, with the final end of program assessments planned for June/July 2009.

The 2008 New England *QuickSmart* numeracy program required independent evaluation of the implementation of the intervention and the project results. To this end, an evaluation team comprising of Mr L Murphy and Professor A R Thomas prepared an independent report of the progress of the New England Region *QuickSmart* project. Their role was to visit each of the ten New England schools on at least one occasion and to independently analyse the data collected so far. Murphy and Thomas' findings can be read in full in their report on the Parent School Partnerships Initiative Program (please refer to Appendix 34 for a full copy of this report).

As Murphy and Thomas (2008) stress in their report, students' results should be interpreted on the understanding that the *QuickSmart* program is at best half way through its complete implementation for nine of the ten schools. The overall effectiveness of the intervention will not be evident until the final data collection in July 2009.

However, students' results on the Progressive Achievement Tests (PAT) and the CAAS assessments still indicate a trend of considerable growth in the performance of the *QuickSmart* students relative to their average-achieving peers. In addition, the CAAS measures provide evidence of increasing automaticity of responses to addition, subtraction, multiplication and division number facts. These results, as well as some examples of comments from stakeholders in the participating schools, are presented in more detail below. It should be noted that at this point in the project a systematic attempt has not been made to collect stakeholder feedback from all schools. A thorough analysis of these qualitative data will, however, follow the final data collection in July 2009.

Table E.9 shows the average scaled scores and standard deviations (in brackets) for students from each school on the standardised Progressive Achievement Tests in Mathematics (ACER, 2005). Although a total of 186 students participated in the

*QuickSmart* program during 2008, pre-test and post/mid-test data from the PAT tests were only available for 160 of these students. Similarly, PAT test data was available for 51 of the total of 67 average-achieving comparison students who participated in this project. Student mobility and absences explain this attrition.

**Table E.9: Students' PAT Test Means and (Standard Deviations)**

School ID	No. of Students		Pre-intervention Mean of PAT Scale Scores (Standard Deviation)		Mid-intervention Mean of PAT Scale Scores (Standard Deviation)	
	QS	COM	QS	COM	QS	COM
S1**	15	7	34.79 (8.77)	40.69 (7.53)	40.81 (10.90)	45.86 (8.88)
S2	25	6	38.90 (6.17)	59.65 (8.44)	42.52 (5.58))	59.5 (7.22)
S3	10	2	41.15 (5.36)	56.40 (0.99)	42.82 (9.92)	62.2 (3.39)
S4	24	5	34.04 (17.05)	52.80 (10.42)	38.46 (12.13)	54.98 (12.10)
S5	14	5	37.89 (6.47)	47.16 (8.43)	37.81 (6.99)	48.94 (7.03)
S6	14	5	41.26 (5.68)	43.32 (3.67)	44.14 (8.91)	49.54 (5.27)
S7	4	7	41.55 (5.17)	56.21 (9.18)	46.17 (6.49)	58.56 (8.01)
S8	22	3	42.38 (8.58)	54.77 (7.96)	47.89 (6.94)	56.77 (9.71)
S9	21	5	46.36 (10.12)	60.1 (6.25)	50.03 (6.41)	55.46 (6.21)
S10	11	6	44.22 (5.85)	69.55 (15.07)	44.52 (6.33)	62.72 (14.81)
TOTAL	160	51	39.93 (10.18)	53.87 (12.10)	43.45 (9.14)	54.97 (10.06)

\*\* S1: Statistics in the Mid-intervention columns are actually Post-intervention statistics for this school as all students have completed the program.

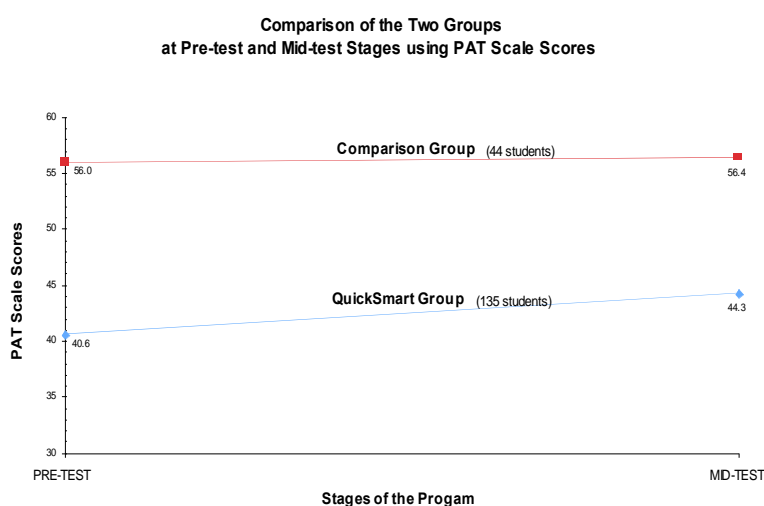
In terms of overall average scale scores across the ten schools in this project, the pre-test scores of the *QuickSmart* students improved by 3.52 points – from 39.93 (10.18) at pre-test to 43.45 (9.14) at mid-test. In contrast, the average scores of the comparison students improved by only 1.1 points from pre-test to mid-test. This equates to a significant difference in terms of effect size between the two groups of students, with *QuickSmart* students obtaining a mid-intervention effect size of 0.36 compared to an effect size of 0.10 for the comparison students. Table E.10 displays this overall statistic as well as the effect size values for each *QuickSmart* school in the New England Region DEEWR project.

**Table E.10: Effect Size Statistics for *QuickSmart* and Comparison Students**

School ID	No. of Students (Effect Size)	
	<i>QuickSmart</i>	COMP
School 1**	15 (0.61)	7 (0.63)
School 2	25 (0.62)	6 (0.02)
School 3	10 (0.21)	2 (2.32)

School 4	24 (0.30)	5 (0.19)
School 5	14 (0.01)	5 (0.23)
School 6	14 (0.39)	5 (1.37)
School 7	4 (0.79)	7 (0.27)
School 8	22 (0.71)	3 (0.23)
School 9	21 (0.43)	5 (-0.74)
School 10	11 (0.05)	6 (-0.46)
TOTAL	160 (0.36)	51 (0.10)

The dramatic difference between the *QuickSmart* Students and the Comparison cohort is illustrated by a graph in the report by Murphy and Thomas (2008), shown in Figure E.9 below.



**Figure E.9: Group comparison on PSPI project after six months**

We end this section with the executive summary from the report submitted to DEEWR on the success of the PSPI project.

## Conclusion

During 2008 Department of Education, Employment and Workplace Relations (DEEWR) funding supported the *QuickSmart* numeracy program in ten New England Region schools. This funding was only available to schools from the beginning of Term 3 in July to the end of November 2008. As a consequence, the results of the intervention reported here are for half of the total number of instructional sessions that will be made available to students included in this *QuickSmart* project.

Students were selected to take part in the *QuickSmart* program based on their need for support in order to improve their numeracy skills and on their consistent attendance at school. In total, 186 low-achieving students, 96 females and 90 males, participated in *QuickSmart* lessons

across the ten New England schools. Their results were compared to those attained by 67 comparison students from the same schools. Therefore, the grand total of participating students for this project was 253. Of the 186 *QuickSmart* students, 125 were identified as Indigenous students.

In terms of results on the Progressive Achievement Tests (ACER, 2005) (a standardised measures of basic mathematical understanding), the pretest scores of the *QuickSmart* students improved by 3.52 from 39.93 ( $sd=10.18$ ) at pre-test to 43.45 ( $sd=9.14$ ) at mid-test. In contrast, the average scores of the comparison students improved by only 1.1 points from pre-test to mid-test. This equates to a significant difference in terms of effect size between the two groups of students with *QuickSmart* students obtaining a mid-intervention effect size of 0.36 compared to an effect size of 0.10 for the comparison students.

Pre-test and mid-intervention information from the Progressive Achievement Tests was available for 105 of the original 125 Indigenous students who began the program. Based on this matched data, the overall effect size for Indigenous *QuickSmart* students was 0.42. This impressive result represents growth of more than a year on standardised scores of basic mathematical ability after only five months' instruction. Note: while average Effect Size for a large cohort over a year is about 0.3 the usual figure for students in the bottom 25% of the cohort is usually close to 0.1.

The participation of parents and Indigenous community members was encouraged in a number of direct and indirect ways throughout the project. For example, a number of schools employed Indigenous community members, Aboriginal Education Officers or Indigenous Teacher Aides as *QuickSmart* tutors. Approximately one-third of the instructors teaching *QuickSmart* in the 2008 New England project were Indigenous.



## SECTION F: QUALITATIVE DATA ANALYSIS – STUDENT AND PARENT PERSPECTIVES

As discussed in Section B of this report, assessment ‘self-factors’ such as student self-efficacy, self-confidence, and scaffolded risk taking are an important part of the *QuickSmart* research framework. Qualitative data about such factors are obtained from learners and parents/guardians, and other stakeholders such as *QuickSmart* Leaders (principals), Coordinators and Instructors, and classroom teachers and school executives, who complete specifically-designed questionnaires.

In preparation for the analysis, the qualitative data were reorganised in three stages as follows:

- transcripts were separated by stakeholders;
- stakeholder transcripts were further separated by schools; and
- student transcripts were further separated by numeracy and literacy.

Each data file was imported into NVIVO 7 and then assigned three attributes – region, school, and year. For every stakeholder, a set of ‘tree nodes’ was developed and each response was coded into one of the nodes. Some (but not many) responses were coded into two nodes. Nodes were developed for each question separately.

Finally, a summary report of the qualitative data analysis was developed for each stakeholder. For students, two reports were produced: one for numeracy and one for literacy. The reports contain both quantitative information (how many respondents, how many schools, how many responses under each particular code) and qualitative information (a selection of salient quotes).

Only student data was separated by literacy and numeracy. With other stakeholder responses it was often difficult to determine whether they were talking about literacy or numeracy. Many of their answers refer to *QuickSmart* in general. When it was not clear whether the response was about numeracy or literacy it was coded together with numeracy. If a response was clearly about literacy, it was coded separately under literacy. Consequently, in all reports (apart from the students’ reports) literacy responses are presented separately at the end of each question section.

These data are analysed and discussed in this part of the report under the following headings:

Summary of Qualitative Data from *QuickSmart* Numeracy Students

Summary of Qualitative Data from *QuickSmart* Literacy Students

Summary of Qualitative Data from Parents and Carers

Each question asked of the different groups from 2003 to 2007 has been analysed separately and (for data other than that obtained from the Northern Territory) the stakeholders’ comments have been organised into summary tables showing: the total number of responses; the number of positive responses; the number of negative responses; and the number of neutral or ‘other’ responses. Note that because each

respondent may have made more than one comment, there will frequently be more responses than there are number of respondents.

## Summary of Qualitative Data from *QuickSmart* Numeracy Students

*QuickSmart* is fuel for the mathematician.

(2007, New England Region, numeracy student)

A total of 299 students who participated in the *QuickSmart* Numeracy program between 2003 and 2007 responded to the questionnaire. Below is a breakdown of their answers to individual questions (using NVIVO 7).

**Table F.1: Qualitative Data from 299 *QuickSmart* Numeracy Students (2003-2007)**

QUESTION	TOTAL NO OF RESPONSES	NO OF POSITIVE RESPONSES	NO OF NEGATIVE RESPONSES	NO OF 'OTHER' RESPONSES
QUESTION 1: How has the <i>QS</i> program been useful to you? Give examples of how it has been useful.	263	213	0	50
QUESTION 2: Think about all the activities you do in your classroom. How have the understandings that you have gained, the strategies that you have learnt, and the fast response times that you have developed in <i>QS</i> sessions been useful in your classroom work?	231	213	3	15
QUESTION 3: Do you use the understandings and fast response times developed in <i>QS</i> lessons in your life outside of school? How? Give examples to illustrate.	219	195	16	8
QUESTION 4: What aspects of the <i>QS</i> program have you enjoyed the most and found most beneficial?	254	244	1	9
QUESTION 5: What aspects of the <i>QS</i> program would you change to make the program more suitable for you and your learning?	201	130	0	71
QUESTION 6: What other comments would you like to make about the <i>QS</i> program?	152	111	0	41
QUESTION 7: Complete the sentence: <i>QuickSmart</i> is.....	247	231	6	10

**QUESTION 1:** How has the *QuickSmart* program been useful to you? Give examples of how it has been useful.

Approximately 263 students answered this question. Most of the comments related to students' increased ability (213 responses). This has been coded into four categories: Improved skills (148 responses); Increased speed (47 responses); Better in comparison to peers (12 responses); and Improvement in other subjects (6 responses).

Among those who commented on *improved skills*, some comments were of a general nature (simply stating that it helped them with maths) – for example:

Yes, I do my maths better (2005, Northern Territory (NT), numeracy student)

I am now good at maths and still improving (2006, Lismore Diocese, numeracy student)

Examples of comments about *increased speed*:

I know my times tables better than I did. I've improved my speed by finding short ways of doing the number facts. And I know about denominators and numerators. And how to change things into a decimal or a percentage and how to put things in the right groups (2003, New England Independent School, , numeracy student)

Comes quicker into my head and I know off by heart. I count faster (2005, NT, numeracy student)

Examples of comments with respect to '*better comparison to peers*':

In maths we have these five-minute tests, and since I started this I've been getting 150 out of 150 (2003, Armidale Diocese, numeracy student)

I got the highest mark in my maths class (2004, North Coast Region, numeracy student)

Approximately 43 students offered comments regarding their improved attitude with respect to mathematics: 29 mentioned increased confidence and 14 increased sense of empowerment. Some of the answers coded as 'increased sense of empowerment' could also have been coded as 'increased confidence'.

Examples of comments about *increased confidence*:

I have moved up in Maths groups and I feel more confident (2005, North Coast Region, numeracy student)

It's been very useful to me because I understand it a lot more and feel more confident with doing maths (2007, New England Region, numeracy student)

Examples of comments about an increased *sense of empowerment*:

It has been very helpful. Now I know stuff that I didn't and I'm not afraid of giving an answer in class (2006, Lismore Diocese, numeracy student)

Well, It's a lot of fun. You get on this laptop computer and press a button if it's right or wrong. And you do lots of Maths, like 5-5 or 6-5. You get better and go on a higher level. We get maths and like 6-3 and it's easier. I know the answer and put it down and it can be right (2003, Armidale Diocese, numeracy student)

Five responses to Question 1 mentioned *usefulness* of what they learnt in *QuickSmart* outside school; for example:

I've learned my times tables and that has really helped me. You can use it anywhere – in class, shopping, just thinking mathematically, just really anything (2003 New England Independent School, numeracy student)

It as helped me with everything that I do like sports that you need to score (2007, New England Region, numeracy student)

Only three responses indicated that the student found *QuickSmart* *unsatisfying* or *had an ambivalent attitude* to it. These were:

Sort of (2005, NT, numeracy student)

It hasn't (2007, New England Region, numeracy student)

Not much useful (2007, Western Region, numeracy student)

**QUESTION 2:** Think about all the activities you do in your classroom. How have the understandings that you have gained, the strategies that you have learnt, and the fast response times that you have developed in *QuickSmart* sessions been useful in your classroom work?

There were 209 responses to this question. The answers were coded into the following 7 categories: Increased speed (71 responses); Improvement in specific areas (68 responses); Self-sufficiency, confidence (20 responses); Better comparison to peers (14 responses); Better problem solving (5 responses); Useful in general (13 responses); and Not useful (3 responses).

Examples of comments emphasising *increased speed*:

I'm able to take away, multiply, divide and add a lot faster and I'm more organised. I am able to do division and multiplication better, faster and get more questions right. Sometimes I get my work done quicker. I feel more confident about answering (2003, Lismore Diocese, numeracy students)

If the teacher puts a question on the board that has something to do with my tables I can do it straight away (2005, Lismore Diocese, numeracy student)

With respect to improvements in specific areas, some comments were of a general nature stating that the student '*improved in maths*'. The majority of the responses mentioned the specific areas of improvement. Typically, this was addition, subtraction, multiplication, and division (times tables). Some students mentioned using 'strategies' and no longer counting on fingers. Some examples of such comments are:

Throughout the *QuickSmart* year, I have learnt lots. I use the multiplication and division facts and all the strategies because we have sheets to do which are pretty hard (2004, Armidale Diocese, numeracy student)

It helps me because I used to count on my fingers and now I don't. We do problems in class and some are really hard. I use my *QuickSmart* program to help me work them out (2004, Armidale Diocese, numeracy student)

Examples of comments indicating increase in *self-sufficiency or confidence*:

Well when I'm in *QuickSmart* I feel really smart like I'm not dumb anymore. When I wasn't doing *QuickSmart* I felt dumb and I didn't really know how to do maths but it helped me in a lot of ways. Like how to do problems, teaching me all my times tables. If it wasn't for *QuickSmart* I don't know where I would be right now. I LOVE *QUICKSMART* (2007, Western Region, numeracy student)

Makes me feel like I can do the work (2007, Lismore Diocese, numeracy student)

Examples of comments indicating *better comparison to peers*:

I use the strategies in numeracy and literacy. I underline the problems and what I have to do in both numeracy and literacy. I've gone up a spelling group in literacy. I'm in one of the top groups for numeracy. I read a lot better than I used to (2004, Armidale Diocese, numeracy student)

It helps me with my sums and division. I can now keep up with the other children in my class. I get a good score with my times tables. It makes it easier and I keep up with the other kids (2007, Western Region, numeracy student)

Examples of comments indicating *improvement in problem solving*:

It has helped me work out maths problems quickly (2007, North Coast region, numeracy student)

Makes me feel confident enough to do it. To do every maths thing and problems, problem solving (2007, North Coast Region, numeracy student)

Some responses indicated that *QuickSmart* was useful in general. These are mostly brief comments like 'yes, a lot' or 'good' or 'it helps'. One example of a more extended response is:

It helped me in all subjects through using strategies and having to work quickly (2007, Lismore Diocese, numeracy student)

Students in one school in the New England Region (2007), responded to this question in terms of *QuickSmart* being *useful in other subjects*; for example:

You have to tell the time in any class. In cooking when we had to add times and minus times.

Help to measure things in woodwork

Geography. *QuickSmart* has helped me in geography – length, height, temperature.

There were only three responses to Question 2 giving a very brief *negative answer*:

No (2004, Lismore Diocese, numeracy student)

Nothing (2007, Western Region, numeracy student)

No (2007, Western Region, numeracy student)

**QUESTION 3:** Do you use the understandings and fast response times developed in *QuickSmart* lessons in your life outside of school? How? Give examples to illustrate.

Approximately 219 students responded to this question. Their comments were coded into five categories: Life skills math (109 responses); Homework (52 responses); Sport and games (16 responses); A ‘yes’ answer (18 responses); and No or not sure (16 answers).

When it comes to life skills maths, the majority of students commented on how it helps them when they are using money in the shop. Some also mentioned its usefulness during various activities at home (especially students living on farms). Some examples of such comments are:

On a long trip to Newcastle, I had fun with mental calculations to fill in the time. I like to do it now. I can tell the time now and I get some answers right on “Who Wants to be a Millionaire” (2003, North Coast Region, numeracy student)

Yes – using them on my chickens when I’m checking they’re all there – keep a check on how many chores I’ve done – I have 8 and I know 4+4 is 8. Counting rocks (2006, NT, numeracy student)

Many students mentioned that it helps them with *homework*, for example:

At home when my mum tests me and on the computer. Helps with homework and all that (2003, Armidale Diocese, numeracy student)

Sometimes when doing homework or I need to measure something (2005, North Coast Region, numeracy student)

At home when I’m doing my homework. My maths homework is most of the stuff I learn in *QuickSmart* (2007, North Coast Region, numeracy student)

Examples of comments of *QuickSmart* usefulness in sports and games:

Of course – reading the Nintendo 64 (2003, North Coast region, numeracy student)

Yes – in cadets, sailing and ice hockey and sometimes map work in the field (2005, Lismore Diocese, numeracy student)

**QUESTION 4:** What aspects of the *QuickSmart* program have you enjoyed the most and found most beneficial?



Approximately 254 students answered this question. Their responses were coded into the following categories: Everything (17 responses); Particular lesson component (201 responses); Getting better (17 responses); Relationship with Instructor (9 responses); Getting out of class (7 responses); Rewards (2 responses); and Negative comments (1 response).

Students indicating that they liked everything offered mostly brief comments like ‘everything’, ‘all of it’, ‘all aspects’; for example:

All of it (2004, Armidale Diocese, numeracy student)

I like it all and I think it is fun and I’ve learnt a lot more than the start of the year. (2004, Armidale Diocese, literacy and numeracy student)

Most students picked particular lesson component(s) as the part they enjoyed most. The word frequency results were as follows: Computer: 75; Flashcards: 60; Games: 50; Speed: 39; CAAS: 13; Bingo: 8; Strategies: 4.

This means that the computer was enjoyed most, followed by flash cards, games, and speed sheets.

Examples of comments about *lesson components students enjoyed most*:

For me the games and the computer and how you use the board (2003, New England Independent School, numeracy student)

I like to use flashcards and computer and the games (2007, Western Region, numeracy student)

Examples of comments by students who most enjoyed the fact that they were ‘*getting better*’

I have improved my Maths a lot and I’m getting better. Try your hardest in Maths and other subjects and don’t worry about other people’s marks because you have done your personal best. All of *QuickSmart* is a great help to me (2003, New England Independent School, numeracy student)

Learning times tables, getting faster at working sums out, division (2003, Lismore Diocese, numeracy student)

I have enjoyed the QS program because I’m happy that I’m good at maths and I’m really confident (2007, New England Region, numeracy student)

Some students enjoyed the opportunity to *develop interpersonal relationships*; for example:

Working on the computer. Love working with Mrs Andrews (2007, North Coast Region, numeracy student)

Teachers are always good to be with: always help you if you get stuck on a question – they give you lots of praise – tell you how you are improving (2007, Lismore Diocese, numeracy student)

Seven students mentioned ‘*getting out of class*’ as the thing they enjoyed most. For example:



Getting out of work to do funner work (2007, Lismore Diocese, numeracy student)

Only two students mentioned rewards:

When we have lollies people enjoy it more (2007, New England region, numeracy student)

The educational games and rewards (2007, North Coast Region, numeracy student)

There was only one student who replied 'no' to this question.

**QUESTION 5:** What aspects of the *QuickSmart* program would you change to make the program more suitable for you and your learning?

Approximately 201 students responded to this question. The answers were categorised as follows: No change required (92 responses); Changing particular aspect (53 responses); Make it longer or more extended (38 responses); More games (17 responses); and Give homework (1 response).

Almost half of the students indicated that they were happy with *QuickSmart* the way it was. Examples of comments indicating the *QuickSmart* is *fine the way it is* include:

Nothing. *QuickSmart* has been a great help to me and I have learned HEAPS (2003, New England Independent School, numeracy student)

Nothing – It is a good program. It is hard at first then easier when you get to learn it (2005, Lismore Diocese, numeracy student)

Nothing, it is so much fun and it is!! (2007, North Coast Region, numeracy student)

Among the students who suggested changes to particular aspects of *QuickSmart*, the computer was most frequently mentioned (though sometimes positively). Most of the responses expressed *subjective preference* without much elaboration; for example:

The computer testing is boring and sometimes too slow (2003, North Coast region, numeracy student)

You can put kids up to a higher level when they get better (2003, Armidale Diocese, numeracy student)

A girl go with a girl and a boy go with a boy. More time on the computer. (2007, Western region, numeracy students)

all computer games involving maths (2007, Western region, numeracy student)

About 38 students suggested that *QuickSmart* lessons should be made *longer, more frequent, or a bit harder*; for example:

By giving us more time like going for forty-five minutes or something (2003, New England Independent School, numeracy student)

More times tables and harder work (2005, Lismore Diocese, numeracy student)

If it went for a whole period and a tiny bit harder (2007, New England Region, numeracy student)

Go everyday (2007, Western region, numeracy student)

Seventeen students *suggested more games*; for example:

Harder focus facts and games; more games (2003, Lismore Diocese, numeracy student)

I would like more games to play because they are very fun and they helped me learn more (2007, New England Region, numeracy student)

One response could be understood as a request for *QuickSmart homework*:

Get a book with games and puzzles and sums to do at home and here (2005, NT, numeracy student)

**QUESTION 6:** What other comments would you like to make about the QS program?

About 152 students responded to this question. The answers were coded under 3 categories: Positive comments - improvement (67 responses); Positive comments – fun (44 responses); and Other comments (41 responses).

Most comments were positive. Some students emphasised the improvement factor and others the fun factor.

Examples of comments *stressing academic improvement*:

It just really, really helped me (2003, North Coast region, numeracy student)

It has helped me a lot mathematically. I'm finding out I'm getting faster at Maths (2003, Lismore Diocese, numeracy student)

I think that the *QuickSmart* program has improved my self-esteem on trusting myself and improve all areas. I like the *QuickSmart* program because it teaches and improves kids with difficulties (2006, Lismore Diocese, numeracy student)

Examples of comments *emphasising fun*:

I learnt heaps and it was fun (2004, Lismore Diocese, numeracy student)

It was so much fun! I would do *QuickSmart* next year if I could! (2005, Lismore Diocese, numeracy student)

It's fun. I laugh when I go there but I do my work. Enjoyable. It's great (2007, North Coast Region, numeracy student)

It's fun, it's good, makes me smart (2007, Lismore Diocese, numeracy student)

The responses coded as '*other comments*' are mostly general commentary on how good *QuickSmart* is and some positive statements about the instructors or some aspect of the program; for example:

I would like *QuickSmart* if it was longer (2007, Western Region, numeracy student)

They are great people and I reckon they should get a prize as well (2007, North Coast Region, numeracy student)

**QUESTION 7:** Complete the sentence: *QuickSmart* is ...

About 247 students responded to this question. The answers were coded under 4 categories: Positive – good (164 responses); Positive – fun (67 responses); Other (10 responses); and Negative comments (6 responses).

Responses categorised as ‘positive (good)’ are mostly one word, or just a few words/statements expressing the student’s attitude towards *QuickSmart*. The word frequency count provides a good summary of these responses: Good: used 50 times; Best: used 26 times; Great: used 26 times; Fun: used 13 times; Learn: used 13 times; Helpful: used 12 times; Learning: used 12 times; Cool: used 6 times.

Examples of more *extended responses* about *QuickSmart*:

good and has helped me improve my maths in lots of little things that I didn’t know or understand (2003, North Coast Region, numeracy student)

It’s great and it actually works (2004, Lismore Diocese, numeracy student)

... A great help for kids who don’t understand Maths (2005, Lismore Diocese, numeracy student)

Responses categorised as ‘positive (fun)’ are very brief statements stressing the fun aspect of *QuickSmart*. Again, the word frequency count provides a good summary of these responses: Fun: used 58 times; Enjoyable: used 6 times; Great: used 6 times; Exciting: used 5 times; Helpful: used 4 times; Cool: used 3 times; Fantastic: used 3 times.

Some examples of such responses are:

*QuickSmart* is ... fun! (2003, Armidale Diocese, numeracy student)

... great, fun and fantastic (2005, Lismore Diocese, numeracy student)

Very fun and cool (2007, New England Region, numeracy student)

Answers that were coded as ‘others’ are *positive responses of a rather random nature*; for example:

Good because it gets me out of class and helps me with maths (2007, Western Region, numeracy student)

Is a group of people the learn (2007, New England Region, numeracy student)

There were six comments that were *coded as ‘negative’*, though that is too strong a word. They just express mild dissatisfaction. These are:

too smart for me (2007, Western Region, numeracy student)

boring (2007, Western Region, numeracy student)

Annoying sometimes (2007, Western Region, numeracy student)

very fun and sometimes boring (2007, Western Region, numeracy student)

boring (2007, Lismore Diocese, numeracy student)

Boring (2007, Western Region, numeracy student)

Overall, the student responses to *QuickSmart* (Numeracy) were overwhelmingly positive. Students were enjoying the program and were aware of its benefits to them.

## Summary of Qualitative Data from *QuickSmart* Literacy Students

Everything is easier since I have been going to *QuickSmart*. Because I've been going to *QuickSmart* and we've been reading more, it makes it quicker and it goes into my head more. You learn more. I've learned a lot more than I've known in the past year that I've been at *QuickSmart*. When I do my schoolwork its much easier to read and easier to pronounce the words, to split them up and be able to read and that and now I'm reading big books and I used to read just little ones.

(Literacy student, 2003, Armidale Diocese)

A total of 62 students who participated in the *QuickSmart* literacy program between 2003 and 2007 responded to the questionnaire. Below is a breakdown of their answers to individual questions (using NVIVO 7).

**Table F.2: Qualitative Data from 62 *QuickSmart* Literacy Students (2003-2007)**

QUESTION	TOTAL NO OF RESPONSES	NO OF POSITIVE RESPONSES	NO OF NEGATIVE RESPONSES	NO OF 'OTHER' RESPONSES
QUESTION 1: How has the <i>QS</i> program been useful to you? Give examples of how it has been useful.	55	55	0	0
QUESTION 2: Think about all the activities you do in your classroom. How have the understandings that you have gained, the strategies that you have learnt, and the fast response times that you have developed in <i>QS</i> sessions been useful in your classroom work?	48	48	0	0
QUESTION 3: Do you use the understandings and fast response times developed in <i>QS</i> lessons in your life outside of school? How? Give examples to illustrate.	47	44	3	0
QUESTION 4: What aspects of the <i>QS</i> program have you enjoyed the most and found most beneficial?	51	48	0	3
QUESTION 5: What aspects of the <i>QS</i>	35	15	0	20

program would you change to make the program more suitable for you and your learning?				
QUESTION 6: What other comments would you like to make about the <i>QS</i> program?	41	37	0	4
QUESTION 7: Complete the sentence: <i>QuickSmart</i> is.....	59	59	0	0

**QUESTION 1:** How has the *QuickSmart* program been useful to you? Give examples of how it has been useful.

There were 55 responses to this question: 36 reported improved skills (reading, spelling, understanding, writing), 8 reported increased speed, 4 commented on better comparison with peers, 3 reported increased confidence, 3 a sense of empowerment, and 1 reported improvement in all areas.

Examples of comments reporting *improved skills* (reading, spelling, understanding, writing):

Lots of ways like reading and spelling. (Literacy Student, 2003, Lismore Diocese)

Yes. There's a difference. It's easier to read and I can understand what it means now. When I read and I can't pronounce the word, I break it up. I say the word and that's what happens. (Literacy Student, 2003, Armidale Diocese)

*QuickSmart* helps you read better and spell words and helps us, like, figure out words and how to read better and stuff. It is good to make our brains focus on words properly and read. (Literacy Student, 2003, Armidale Diocese)

Examples of comments reporting *increased speed*:

I have got quicker and smarter because I get more work done now than what I did. (2003, Lismore Diocese)

Well it's fun and educational and you learn lots. You read cards and record what you get every day and you try to beat your score. I reckon it has helped me because now I have started it I am a faster reader. I'm able to figure out larger words that are harder. (Literacy Student, 2003, Armidale Diocese)

I can finish my work quicker. I have learnt about reading strategies to help me understand the story. (2007, Lismore Diocese)

I can finish my work quicker now. I don't take as long to do tests. (2007, Lismore Diocese)

Examples of comments reporting *better comparison with peers*:

Definitely! Like, when we go to high school it will a lot easier for us to read and everything ... better understanding of the words. And well, we're in the top spelling and reading group in our classroom. (Literacy Student, 2003, Armidale Diocese)

I can spell more words and I am in a higher reading group. (Literacy Student, 2003, Armidale Diocese)

For my reading. I started at a level 18 now I'm at level 26. (2006, Lismore Diocese)

*QuickSmart* has been useful to me when we have had tests in class and when I am asked a question I can answer quickly. (2006, Lismore Diocese)

Examples of comments about *increased confidence*:

QS has helped me with my reading, sounding out and understanding what letters make other letters say. I am more confident for high school. (2003, Lismore Diocese)

I'm more confident and I can read better and do more things better. (2006, Lismore Diocese)

*QuickSmart* have given me confidence to read better. (2006, Lismore Diocese)

Examples of comments conveying a *sense of empowerment*:

We did a reading task in class the other day and I finished it – I felt great. (2003, North Coast Region)

Everything is easier since I have been going to *QuickSmart*. Because I've been going to *QuickSmart* and we've been reading more, it makes it quicker and it goes into my head more. You learn more. I've learned a lot more than I've known in the past year that I've been at *QuickSmart*. When I do my schoolwork its much easier to read and easier to pronounce the words, to split them up and be able to read and that and now I'm reading big books and I used to read just little ones. (Literacy Student, 2003, Armidale Diocese)

I read more and I can write better. I love reading. I read better. I hated reading. I love it because I come to *QuickSmart*. Before I didn't have much confidence and I wasn't coming here. I'd only read for like three minutes and put the book down. It was boring. I like reading more because I can read bigger words. I can read more chapter books. I can read more books. I can read silently better and I can read to Mum. (Literacy Student, 2003, Armidale Diocese)

One comment claimed *improvement in all areas*:

It has improved in all areas. (2006, Lismore Diocese)

**QUESTION 2:** Think about all the activities you do in your classroom. How have the understandings that you have gained, the strategies that you have learnt, and the fast response times that you have developed in *QuickSmart* sessions been useful in your classroom work?

There were 48 responses to this question: 25 reported improvement in specific areas (reading, writing, understanding, classroom work), 16 increased speed, 4 increased confidence and self-sufficiency, and 3 reported on better comparison to peers.

Examples of comments about *improvement in specific areas* (reading, writing, understanding, classroom work):

*QuickSmart* helped me to understand some of the English class lessons because I remembered words and meanings. (Literacy Student, 2003, North Coast Region)

It has helped me in my reading and my classroom work. (Literacy Student, 2003, North Coast Region)

I understand more things in English and Spelling. (2003, Lismore Diocese)

*QuickSmart* helps me pronounce all my words and with comprehension. I used to be no good at comprehension. I know how to do it now. I read the question and do it. (Literacy Student, 2003, Lismore Diocese)

Examples of comments highlighting *increased speed*:

I'm finishing my tasks a lot faster and I'm up to the normal standard with grades if not better. (2003, Lismore Diocese)

Being able to read quicker helps me in tests. (2005, Lismore Diocese)

It has been useful in the classroom by getting me quicker. (2006, Lismore Diocese)

I can respond to questions quicker. And I feel comfortable in class. (2006, Lismore Diocese)

I'm faster at my work. I can work to a time limit. (2007, Lismore Diocese)

Four responses mentioning *increased confidence and self-sufficiency*:

Yes it has. I feel more confident and more better at work in the classroom. (2006, Lismore Diocese)

I don't need help with my reading anymore because Mrs Fraser helped me to gain confidence in myself and helped through hard words that I though were difficult. (2006, Lismore Diocese)

More confident in reading out loud. (2007, Lismore Diocese)

Doing activities to a time limit. More confident with reading. (2007, Lismore Diocese)

Three responses related to *better comparison to peers*:

When we did test, it really helped when we were asked questions. (2005, Lismore Diocese)

I am not falling behind. Sound out better, and understanding. (2006, Lismore Diocese)

Yes, I have got better marks in my tests and the questions are easier to do since I went to *QuickSmart*. (2006, Lismore Diocese)



**QUESTION 3:** Do you use the understandings and fast response times developed in *QuickSmart* lessons in your life outside of school? How? Give examples to illustrate.

There were 47 responses to this question: 28 reported that it helps them in various life skills (using the computer, helping parents, reading movie subtitles, reading a TV guide, and enjoyment of reading), 13 mentioned that it helps them with their homework, 3 replied with a simple ‘yes’, and 3 replied ‘no’ or ‘not really’.

Examples of comments suggesting *improvement in various life skills*:

Of course – read the TV guide and the computer. (Literacy Student, 2003, North Coast Region)

Yes. If I’m watching a movie with captions I can stay ahead with the movie. If I’m reading to my parents, I’m a lot better and faster. (2003, Lismore Diocese)

I enjoy books more. I understand test questions more. (2005, Lismore Diocese)

I read more at home. (2006, Lismore Diocese)

Examples of comments mentioning that *QuickSmart helps with homework*:

I am able to get my homework done faster. (2003, Lismore Diocese)

Doing homework. (Literacy Student, 2003, Armidale Diocese)

It helps with my homework. (2006, Lismore Diocese)

With my homework I can finish it all in the set time. I like to read more and I understand what I’m reading. (2007, Lismore Diocese)

Try to finish all my homework in a set time. I like to learn new things now and I’m not scared to ask questions. (2007, Lismore Diocese)

**QUESTION 4:** What aspects of the *QuickSmart* program have you enjoyed the most and found most beneficial?

There were 51 responses to this question: 1 suggested that the student liked it all, 44 enjoyed and found most beneficial a particular lesson component, 2 enjoyed increased speed or confidence, 1 enjoyed the relationships, and 3 mentioned rewards.

One response suggesting that the student *liked it all*:

Probably the flashcards but all of it. I like it all. (Literacy Student, 2003, Armidale Diocese)

Responses highlighting a particular lesson component that the student found most enjoyable and beneficial mentioned flash cards (26 responses), computer (17 responses), reading passages (8 responses), games (6 responses), spelling (2 responses) and graphs (1 response).

Examples of comments *highlighting particular lesson components* as enjoyable/valuable:

With the graphs you can see how you did with the task straight away. It’s exciting and you feel really great. (2003, North Coast Region)

The computer test because it has helped me to be faster and better reader and speller; flashcards because you're always thinking. (2003, Lismore Diocese)

The computer because there are different words all the time. In the flashcards you read the same words and you read the passage again, but on the computer they mix them around so you don't know what's coming. There are words like 'contemporary' and 'stationary'. (Literacy Student, 2003, Armidale Diocese)

I have enjoyed doing the reading passages and the flashcards. (2006, Lismore Diocese)

The 5 min games. (2006, Lismore Diocese)

Two responses stated that the student particularly enjoyed *increased speed or confidence*:

Letting me work faster and working faster and faster every time. (2003, Lismore Diocese)

Learning to read more confident. (2006, Lismore Diocese)

One response dwelt on the *importance of relationships*:

The teachers and the people in your group. (2006, Lismore Diocese)

Three responses mentioned *rewards*:

Lollies! And going on the computer and beating your own record what you got last time. And I like reading. I'm reading Harry Potter for the second time. (Literacy Student, 2003, Armidale Diocese)

The weekly lolly and the monthly treat! OK, Doing more reading and writing helps me. When Jenny reads with me and when we do the flashcards. (Literacy Student, 2003, Armidale Diocese)

Flash cards and getting rewards. (2006, Lismore Diocese)

**QUESTION 5:** What aspects of the *QuickSmart* program would you change to make the program more suitable for you and your learning?

There were 35 responses to this question: 14 suggested a particular change (make it harder, make it more fun, more flashcards, help with classroom work, introduce computer typing), 9 stated that no change was required, 6 proposed that the program should be longer or extended, 5 would welcome more games, and 1 response suggested giving homework.

Examples of comments *suggesting a particular change*:

Bingo – make the words harder and have a group with more kids in it. (Literacy Student, 2003, North Coast Region)

Make the computer reading exercises more fun. (Literacy Student, 2003, North Coast Region)

Making the computer quizzes more enjoyable because after a while it gets boring. (2003, Lismore Diocese)

Put in harder words like in middle words – they are too easy for me.  
(2003, Lismore Diocese)

Examples of comments stating that *no change* is required:

Improved? No. [Literacy Student] (2003, Armidale Diocese)

Nothing. (2006, Lismore Diocese)

I think that there is nothing wrong. (2006, Lismore Diocese)

It is great the way it is. (2006, Lismore Diocese)

I would do it in year 8 but other than that I would change nothing.  
(2006, Lismore Diocese)

Examples of comments suggesting the *program should be longer or extended*:

You can't really, it's really good. Probably not often enough. More time for each session? (Literacy Student, 2003, Armidale Diocese)

Probably make it longer and put more educational games in it, maybe.  
(Literacy Student, 2003, Armidale Diocese)

Have it more often! (2006, Lismore Diocese)

Examples of comments *proposing more games*:

More computer word and games. (Literacy Student, 2003, North Coast Region)

Probably make it longer and put more educational games in it, maybe.  
(Literacy Student, 2003, Armidale Diocese)

I would put more fun into how you teach *QuickSmart*. More games that teach you. (2005, Lismore Diocese)

One response suggested *QuickSmart homework*:

Give us homework to do. (Literacy Student, 2003, Armidale Diocese)

**QUESTION 6:** What other comments would you like to make about the *QuickSmart* program?

There were 41 responses to this question: 22 positive comments stressing the student's improvement, 15 positive comments stressing the fun factor of *QuickSmart*, and 4 comments of a more random nature. There were no negative comments.

Examples of **positive comments stressing improvement**:

I think you're on a good thing; keep going because it really helped me so I would like it to help others. I enjoyed Bingo and quick flashcards.  
(2003, Lismore Diocese)

How *QuickSmart* helps you is that I can read better than I could before. I couldn't do my comprehension before but now I can do comprehension. I like reading. I like going through the flashcards. I like the Bingo game. (Literacy Student, 2003, Armidale Diocese)

Do *QuickSmart* again next year to improve more. (2005, Lismore Diocese)

I can't believe how fast I have learnt. (2006, Lismore Diocese)

I'm more confident with my work. I know that I can do things. I don't feel silly to ask questions if I don't understand. (2007, Lismore Diocese)

I liked it. It has helped me a lot in the classroom and with my homework. (2007, Lismore Diocese)

Examples of positive comments *stressing the fun factor*:

It's fun and helps you learn. You get out of class but I get the answers when I go back. Mum usually asks everyday that I go how I am doing in *QuickSmart*. My brother asks, "How come you get out of class?" I say because I get to do something special". (Literacy Student, 2003, Armidale Diocese)

It was fun and I enjoyed it. (2006, Lismore Diocese)

It is heaps fun and it teaches you a lot. (2006, Lismore Diocese)

The teachers are great and what we do is fun. I loved it. (2006, Lismore Diocese)

It was fun and I would like to do it again. (2007, Lismore Diocese)

Examples of *more random comments*:

That some things were fun and others were not as much fun e.g. Bingo was fun, flashcards were not as much fun. (2003, Lismore Diocese)

Not much but I would like to pick the time I go to *QuickSmart*. (2006, Lismore Diocese)

No American spelling for Australian schools. (2006, Lismore Diocese)

I would just like to thank the teachers. (2006, Lismore Diocese)

**QUESTION 7:** Complete the sentence: *QuickSmart* is .....

There were 59 responses to this question: 32 using words that suggest that *QuickSmart* was very helpful to the student (words like good, great, best, useful, help) and 27 stressing the fun factor. There were no negative or neutral responses.

Examples of comments suggesting that *QuickSmart* was *very helpful* to the student:

good to do. (Literacy Student, 2003, North Coast Region)

a great program for kids because it is pretty easy and you learn stuff. (Literacy Student, 2003, North Coast Region)

A very useful program. I have learnt a lot things from QS. (2003, Lismore Diocese)

*QuickSmart* is the best program in the world. (Literacy Student, 2003, Armidale Diocese)

I think that *QuickSmart* has helped me a lot. (Literacy Student, 2003, Armidale Diocese)

Examples of comments *stressing the fun factor*:

Fun! Fun! Fun! (2003, Lismore Diocese)

Fun to do. (Literacy Student, 2003, Lismore Diocese)

Cool, fun and helping me in maths. (2006, Lismore Diocese)

fun and educational. (2006, Lismore Diocese)

fun, interesting, and I want to do it again. (2007, Lismore Diocese)

Overall, the responses from students were overwhelmingly positive. Students enjoyed the program and were well aware of its benefits to them in terms of improved literacy skills. They noticed the benefits both in school and outside school.

## Summary of Qualitative Data from Parents and Carers

*QuickSmart* has had a huge effect on our daughter's performance at school. Most notably the Basic Skills results. In Year 3 she was in the bottom 30% of the state. This year, in Year 5, she was in the top 30%.

(2005, Lismore Diocese)

Confidence is so improved. Skills are amazing. Her attitude to doing work is so much better. Best thing that ever happened to my child this year.

(2006, Lismore Diocese)

In total 86 parents and carers from 27 schools that used *QuickSmart* between 2003 and 2007 responded to the questionnaire. Below is a breakdown of their answers to individual questions (using NVIVO 7).

**Table F.3: Qualitative Data from 86 *QuickSmart* Parents and Carers (2003-2007)**

QUESTION	TOTAL No. OF RESPONSES	No. OF POSITIVE RESPONSES	No. OF NEGATIVE RESPONSES	No. OF NEUTRAL RESPONSES
QUESTION 1: Comment on the <i>QS</i> program that has been offered to your child during this year.	82	76	0	6
QUESTION 2: What effect has the <i>QS</i> program had on the performance of your child at school in terms of their attitude to learning, confidence and successful learning in all areas of the curriculum?	89	87	0	2
QUESTION 3: What effect has the <i>QS</i> program had on the performance of your child at home, for example in doing homework, in reading for pleasure, in completing maths calculations or participating in leisure activities?	78	72	0	6

QUESTION 4: What feedback have you had about the <i>QS</i> program from your child?	78	73	0	5
QUESTION 5: Other comments about the <i>QS</i> program	64	54	0	10

Most of the answers relate to the *QuickSmart* Numeracy program. If it was not clear whether the respondent was referring to the Numeracy or the Literacy program, the entry was grouped together with the Numeracy responses. Responses that directly referred to the *QuickSmart* Literacy program were grouped separately.

**QUESTION 1:** Comment on the *QuickSmart* program that has been offered to your child during this year.

There were 71 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general): 66 responses were straightforwardly positive, 2 responses provided mere description of *QuickSmart* or who participated in it, and 3 responses addressed the issue of feedback and communication. In addition, there were 11 responses referring to the *QuickSmart* Literacy program: 10 straightforwardly positive comments and 1 descriptive comment. There were no negative comments.

Examples of *positive* responses:

I feel my child has been very privileged to participate in this program. The benefits have only been positive. (2003, Lismore Diocese)

... is a quiet child who is always very co-operative in class and will never draw attention to himself. He is a “slow processor” and always appears to be listening in class. However, he often does not understand exactly what to do and does not have the confidence to ask. The result of this is that he attempts many tasks when he is still unsure what to do, but will complete it incorrectly anyway. He hides a lot of his work. *QS* has changed many of these behaviours. At home he has become more confident to ask where he went wrong or to admit that he doesn’t know what to do. A lot of frustration has gone and he listens now with the confidence that he ‘will’ understand what to do. A large wall blocking his learning has been lifted. (2003, Lismore Diocese)

It is wonderful. My son was a long way behind on maths. After being on *QuickSmart*, his confidence has skyrocketed and his maths abilities now are incredible. Thanks so much for *QuickSmart*. (2004, Armidale Diocese)

I think this program should be offered throughout the whole school. It changes lives for the better. (2005, Lismore Diocese)

A. loved the program and doing it with another child as well made her want to strive to do great things. She loved to work with the computer. (2005, Lismore Diocese)

Two of the responses were merely *descriptive*:

Liza participated in the mathematics. (2006, Lismore Diocese)

*QuickSmart* is a maths programme whereby students who are eligible have access to a tutor, in small groups, 3 times a week. I think it's about memorising rather than problem solving? (2007, Lismore Diocese)

Three comments addressed the issue of *feedback and communication*:

Initially we were unaware Shenae was being considered for the program and rang school for an explanation. I think it's a great idea but thought communication with parents could be better. (2007, North Coast Region)

I had little feedback about my child's performance and so can't tell if they have improved or not. From memory I only received one evaluation sheet at the beginning of term 4. (2007, Western Region)

I am glad that Sam has this opportunity, but I am unable to comment, as I have had no feedback. (2007, New England Region)

Examples of *positive comments* about the *QuickSmart* Literacy Program

The *QuickSmart* program has helped my child with the basics in literacy. (2004, Armidale Diocese)

Joel has enjoyed his time at *QuickSmart* immensely. He feels very special to be part of the group. His twin sister is jealous that she is not part of the group even though she is not struggling with any part of her schoolwork. (2006, Lismore Diocese)

My son has enjoyed the *QuickSmart* program. I would like to see the program go through out the year. (2006, Lismore Diocese)

I think the *QuickSmart* program has been a great success on K. I have seen him improve every day. (2007, North Coast Region)

There was also one descriptive response about the *QuickSmart* Literacy program:

My child took part in the literacy program in terms 1, 2, and 3. (2005, Lismore Diocese)

**QUESTION 2:** What effect has the *QuickSmart* program had on the performance of your child at school in terms of their attitude to learning, confidence and successful learning in all areas of the curriculum?

There were 77 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general): 60 responses mentioned increased confidence and self-esteem and improved attitude to learning, 16 highlighted academic improvement, and 1 response was neutral. In addition, there were 12 responses referring to the *QuickSmart* Literacy program: 7 dwelt on increased confidence and self-esteem and improved attitude to learning, 4 focused on academic improvement, and 1 response was neutral. There were no negative responses.

Examples of positive comments stressing *improve confidence, self-esteem and attitude to learning*:



The feedback that I have had from my child's teachers tells me the program has had a positive effect in all areas, particularly confidence. (2003, Lismore Diocese)

My child had a brilliant year in 2004. No doubt *QuickSmart* contributed to her success. St Joseph's have done a great job with her. In 2002, I had to force her to school and hand her over to a teacher. Today she loves school and is so excited over going to O'Connor secondary school, it's all we hear about. (2004, Armidale Diocese)

Confidence is so improved. Skills are amazing. Attitude to doing work is so much better. Best thing that ever happened to my child this year. (2004, Armidale Diocese)

The performance at school in terms of attitude to learning and confidence was evident throughout the program and very successful. (2005, Lismore Diocese)

Remarkable! From a little girl who verbalised she was 'dumb' and completed homework for Maths amidst tears to a confident, have-a-go child who now knows she is a good and able and successful learner! No external gratification/rewards can convince children they can do it. The *QuickSmart* program has delivered skills and accuracy, underpinned by a 'have-a-go' and 'trust your head' philosophy. ALL K.L.A's at school shine now as my child is now a "*QuickSmart* Girl". (2005, Lismore Diocese)

Examples of comments emphasising *academic improvement*:

*QuickSmart* has had a huge effect on our daughter's performance at school. Most notably the Basic Skills results. In Year 3, she was in the bottom 30% of the state. This year, in Year 5, she was in the top 30%. She is able to complete homework tasks without much assistance. She was already confident and capable with all other areas of the curriculum but was not confident with Maths. Her confidence has increased considerably. (2004, Armidale Diocese)

Huge improvement in confidence and ability. He loves maths now and I don't have to hassle him to do homework. His end-of-year award was for improvement in Maths. (2004, Armidale Diocese)

My child displays greater enthusiasm and increased confidence. She has really improved her Basic Skills Test results. She gained top marks in the Basic Skills Test where previously she was in the lower bands. (2005, Lismore Diocese)

The *QuickSmart* program has had a very positive effect on Christine. Being able to see her results compared to other students and her previous ability has been positive. It's difficult to know how it will carry over into the classroom, but my observations with her homework have been good. (2006, Lismore Diocese)

There was one *neutral* response (*QuickSmart* Numeracy):

Unsure – J... has only started *QuickSmart*. (2007, New England Region)

Examples of comments stressing *improved confidence, self-esteem and attitude to learning* (*QuickSmart Literacy*)

She seems more confident. (Literacy Student, 2003, North Coast Region)

He has gained confidence which I believe is the most important thing for a child to have in order to learn. His comprehension has really improved and his reading. (2004, Armidale Diocese)

This program has been a great asset for Kieran as he now does his homework on his own, without guidance from me. He is reading more often and his confidence has improved greatly. (2006, Lismore Diocese)

I don't see K. do much homework but I have seen K. improve daily. His confidence about reading and the computer is amazing. (2007, North Coast Region)

Examples of comments about *academic improvement* (*QuickSmart Literacy*)

It has helped quite considerably, because I believe, in our case, repetition is the only way to help learn the basics of reading, especially spelling. (2004, Armidale Diocese)

The program had definite results for my child's confidence. She understood how much her spelling was improving and how much quicker she was with reading list words. Her Basic Skills Test results in Literacy shows her improvement. Her comprehension abilities are comparable with the school's average. (2005, Lismore Diocese)

There was also one *neutral* response (*QuickSmart Literacy*):

I am not sure what affect it has had at school. (2006, Lismore Diocese)

**QUESTION 3:** What effect has the *QuickSmart* program had on the performance of your child at home, for example in doing homework, in reading for pleasure, in completing maths calculations or participating in leisure activities?

There were 62 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general): 38 described the beneficial effect of the program on the child at home, 19 related to the program's positive impact on homework, and 5 responses were neutral. In addition, there were 16 responses referring to the *QuickSmart* Literacy program: 15 described its positive impact on the child at home, and 1 response was neutral.

Examples of comments about the *beneficial effect* of the program

My child seems more confident in his Math work at home, and this shows through working independently. (2003, Lismore Diocese)

More independent in completing mathematics tasks. (2004, Armidale Diocese)

Enjoys doing calculations for different things. She also enjoyed showing us how she could calculate things in different ways. Increased independence in doing homework. (2005, Lismore Diocese)

S.... writes out his own maths problems at home and asks for us to write some for him to do. This is a big change. (2006, NT)

Examples of comments focusing on the *positive impact* of the *QuickSmart* program on homework

Homework [especially Maths] is done in a calm, confident manner. It isn't a stressed out, hair pulling nail biting exercise any more. (2004, Lismore Diocese)

The school and *QuickSmart* combined have created a child who wants to learn. She happily completes her homework. (2004, Armidale Diocese)

Unbelievable- Homework is completed on her own. From the wings I watch and can see the confidence with which she works things through. In daily life there have been occasions that we have simply been stopped in our tracks as our child completes something confidently and correctly. The other key notables are that 'mistakes' aren't a disaster, they are more viewed by our child as a rung up the ladder to the goal! *QuickSmart* has changed her life! Truly. (2005, Lismore Diocese)

She is trying a lot harder when doing homework and occasionally uses maths in everyday things. (2006, NT)

mainly she has gained confidence in herself knowing she can solve problems. (2006, Lismore Diocese)

He knows when he hasn't been given the correct change at shops and how far to travel on trips. (2007, New England Region)

He has a better understanding of the cost of things when we shop and how much a few items will cost. (2007, North Coast Region)

Scott is now reading without being prompted by us. Whilst shopping he will add/subtract and half the price of items and is correct 90% of the time, also uses his new found skills with his sport. (2007, New England Region)

Examples of comments about the *positive effect* of the *QuickSmart* program on the child at home (*QuickSmart* Literacy)

She is attempting more difficult reading now. She is not that scared any more of making mistakes. (Literacy Student, 2003, North Coast Region)

He had the confidence to do his homework with very little help and he reads magazines for pleasure. It helped him feel good about himself. (2004, Armidale Diocese)

My child has shown much more interest in reading books at home this year and is currently reading the books in the series of Unfortunate

Events. I also feel she is developing the skill of summarising events. She is capable of writing short stories that have a theme and an order. She joins in conversations at home much more often and with more conviction. (2005, Lismore Diocese)

Increased reading at home. (2006, Lismore Diocese)

I have noticed Isaac reading more and he seems more confident in reading newspapers, pamphlets, notes, etc. (2007, Lismore Diocese)

There was also one **neutral** response (*QuickSmart* Literacy):

I wish I could say 'yes' to this. At home he is good, but chores are done because he knows what is expected of him at home. He still doesn't read for pleasure even with my effort of looking for books he may like. He hates shopping! (2005, Lismore Diocese)

**QUESTION 4:** What feedback have you had about the *QuickSmart* program from your child?

There were 70 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general): 65 conveyed positive feedback from the child, 3 indicated no or very little feedback, and 2 responses mentioned the lack of communication between the school and the parent. In addition, there were 8 comments conveying positive feedback from children who did the *QuickSmart* Literacy program. There was no negative feedback from any of the respondents.

Examples of *positive comments* from the child (*QuickSmart* Numeracy or *QuickSmart* in general):

My child loved it. What more can I say. If they love something they will only gain good from it. (2003, Lismore Diocese)

My child has commented on numerous occasions on how enjoyable the program has been. (2003, Lismore Diocese)

She would tell us about her *QuickSmart* sessions – was happy to be part of the program. (2004, Armidale Diocese)

Christine is very positive about QS. She has not wanted to miss one lesson. It's one of the highlights in her week. She sees improvements in her ability from week to week. This brings her a lot of satisfaction. (2006, Lismore Diocese)

Two responses related to the *lack of communication* between the school and the parent:

Initially I had a letter explaining the programme, however I have had no information via the school since then until the end. (2007, Lismore Diocese)

I spoke to the classroom teacher only to enquire as to what the program was. (2007, North Coast Region)

Examples of *positive comments* from children about the *QuickSmart* Literacy program:

She is enjoying the program. (2003, North Coast Region)

That it was enjoyable. (2004, Armidale Diocese)

Would tell me stories on Mon/Wed/Fri of her flash card times and her improvement. Very excited when she beats PB results. (2006, Lismore Diocese)

I get a lot of feedback from my child. He enjoys it very much even if at sometimes he misses other subjects like sports. (2007, Lismore Diocese)

#### **QUESTION 5:** Other comments about the *QuickSmart* program

There were 58 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general): 45 offered positive commentary on *QuickSmart*, 3 conveyed positive comments with qualifications, 3 offered suggestions to extend the program, 5 mentioned communication difficulties between school and parents, and 2 comments were of a random nature (not related to *QuickSmart*). In addition, there were 6 positive comments about the *QuickSmart* Literacy program.

Examples of *positive comments* (*QuickSmart* Numeracy or *QuickSmart* in general)

We are eternally grateful to the QS program. It is the only one on one program which has been offered to our child and it has brought him up to speed with his peers and given him an excellent 'can do' attitude to learning in time for high school. He now has one more year of primary school to consolidate and further improve and we know that he has a solid base for high school numeracy. Thank you! (2003, Lismore Diocese)

What a great program, not just for the student but for the family as a happy more confident child comes home telling of praise and encouragement during her day. Well done and thank you to all involved. (2004, Lismore Diocese)

This is an excellent program and kids that get to do it are envied by the others rather than laughed at. It is a shame that all kids can't do it. (2004, Armidale Diocese)

We think the *QuickSmart* program is a wonderful program to students experiencing learning difficulties and thoroughly recommend the program. The confidence shown and gained after the program shows through their school work. (2005, Lismore Diocese)

One of the best things about *QuickSmart* is that it seems to sponsor a really positive interested attitude to maths – even if you're not really good at it. But then that could be coming from the class teacher and school as a whole as well. Well done. (2006, NT)

There were three *positive comments with qualifications* (*QuickSmart* Numeracy or *QuickSmart* in general):

Consistency. This start, stop swapping tutors, etc. Is the only fault I could find about this program. My child enjoyed immensely just did not get enough! (2007, Western Region)

The only dislike the students seem to all say is they don't like being out of class in the middle of work, and find it hard to get back to what they were doing previously and get it finished (2007, Western Region)

L.'s only other comment was that she may have missed out on other classwork while she attended the *QuickSmart* program. (2005, Lismore Diocese)

Three comments suggested *extending the program* (*QuickSmart* Numeracy or *QuickSmart* in general):

It would be great to see this program available to all students. (2003, Lismore Diocese)

The only problem was that it didn't go for 12 months. A. is going well but 12 months would have been great. (2005, Lismore Diocese)

Would it be worth considering a home program to support the school based program and reinforce. Excellent program, thank you. (2007, North Coast Region)

Examples of comments about *communication difficulties* between the school and parents

More feedback throughout the year and the opportunity to converse at parent teacher evenings about child's progress. (2006, Lismore Diocese)

Perhaps some information be sent home on what they are doing during the program. (2007, Western Region)

More progress reports would be welcome. (2007, Western Region)

Be good if the parents were more informed about it so they could use some of the tactics at home. (2007, Lismore Diocese)

Examples of *positive comments* about the *QuickSmart* Literacy program

I only wish that my son could have been involved in the Maths program as well and had the benefit of the program for longer. FANTASTIC PROGRAM! It worked well because of the wonderful work that the instructor did to make the program fun and the children feel proud of themselves. (2004, Armidale Diocese)

Thankyou for giving my child the opportunity to participate in this program. I feel she could benefit by doing *QuickSmart* Numeracy next year. (2005, Lismore Diocese)

Thank you so much for giving Joel and these other kids the chance to catch up with the other kids. (2006, Lismore Diocese)

Extremely pleased that my daughter participated in the program. (2006, Lismore Diocese)

Overall, the responses from parents and carers were overwhelmingly positive. They conveyed the positive feedback that they received from the child and commented on increased confidence, self-esteem and improved attitude at home (around numeracy

and literacy tasks and homework). Three parents wished there was better communication between them and the school. There were no negative comments from parents and carers.



## SECTION G: QUALITATIVE DATA ANALYSIS – SCHOOL PERSPECTIVES

This section mirrors Section F in which assessment ‘self-factors’ such as student self-efficacy, self-confidence, and scaffolded risk taking are an important part of the *QuickSmart* research framework. In this section qualitative data about such factors are obtained from stakeholders such as *QuickSmart* Leaders (principals), Coordinators and Instructors, classroom teachers, and school executives, who complete specifically-designed questionnaires. In addition, qualitative data with feedback about the utility and value of the professional development workshops in the Northern Territory have been collected over three years (2006, 2007 and 2008).

These data are analysed and discussed in this part of the report under the following headings:

Summary of Qualitative Data from *QuickSmart* Instructors

Summary of Qualitative Data from Principals

Summary of Qualitative Data from Special Needs Coordinators

Summary of Qualitative Data from Teachers

Summary of Qualitative Data from the Northern Territory *QuickSmart* Professional Development Workshops (2006 – 2008)

Each question asked of the different groups of stakeholders from 2003 to 2007 has been analysed separately and (for data other than that obtained from the Northern Territory) the stakeholders’ comments have been organised into summary tables showing: the total number of responses; the number of positive responses; the number of negative responses; and the number of neutral or ‘other’ responses. Please refer to Appendix 35 for a detailed report on the qualitative analysis

### Summary of Qualitative Data from *QuickSmart* Instructors

I’ve really enjoyed seeing the enthusiasm of the students. They are focussed, keen and learning. They know how the session works and are always organised because if they are on task we should have time for a game. The focus words are excellent, they allow for a scope of activities and they really reinforce their improvements and improve their confidence.

(2006, Lismore Diocese)

In total 56 instructors from 33 schools that used *QuickSmart* between 2003 and 2007 responded to the questionnaire. Some of the instructors were teacher’s aides and some were teachers. One instructor was assistant principal and one was a Learning Difficulties teacher. Below is a breakdown of their answers to individual questions.

**Table G.1: Qualitative Data from 56 *QuickSmart* Instructors (2003-2007)**

QUESTION	TOTAL No. OF RESPONSES	No. OF POSITIVE RESPONSES	No. OF NEGATIVE RESPONSES	No. OF NEUTRAL RESPONSES
QUESTION 1: Comment on the <i>QS</i> program that you have offered in your school during 200_.	54	46	0	8
QUESTION 2: What effect has the <i>QS</i> program had on the performance of your <i>QS</i> students? Comment on these students' performance in terms of their academic achievement in the classroom, the students' abilities to focus and concentrate on their schoolwork, and their self-esteem as learners.	72	72	0	0
QUESTION 3: With regard to the <i>QuickSmart</i> program, what do you think have been the positive aspects of the program?	53	53	0	0
QUESTION 4: With regard to the <i>QuickSmart</i> program what do you think have been the negative or challenging aspects of the program? (Note, the question specifically asked for 'negative' feedback)	44		44	
QUESTION 5: The <i>QS</i> program has been offered as an intense small group intervention in your school. How effective has this been for your students?	48	45	0	3
QUESTION 6: Other comments about the <i>QS</i> program you would like to make. For example, what do you see as the possible future of the <i>QS</i> program in your school?	46	46	0	0

Most of the answers relate to *QuickSmart* Numeracy program. If it was not clear whether the respondent referred to the Numeracy or Literacy program, the entry was grouped together with the Numeracy responses. Answers that directly referred to the *QuickSmart* Literacy program were grouped separately.

**QUESTION 1:** Comment on the *QuickSmart* program that you have offered in your school during 200\_.

Of the 56 instructors, 54 answered this question: 38 responses were positive about the *QuickSmart* program in general, 6 answers were positive with qualifications, 8 comments were coded as 'other', and 2 comments were positive about the *QuickSmart* Literacy program. There were no negative responses.

The majority of the answers (38) were unequivocally positive. The respondents stressed the ease of implementation of *QuickSmart* and its beneficial effects on their students.

Examples of *positive responses* to Question 1 include:

The program is systematic, allows for intensive practice of essential basic skills and develops self-analysis/evaluation of progress. (2003, North Coast Region)

At start of program – Students were very tentative and under confident in their approach to most Maths tasks. Comments included “ Why am I doing this, I’m dumb at Maths”. “I’m no good at Maths, I hate it” At the beginning students would fidget, spin on chairs and fiddle with resources. At the end of the program, students were far more accepting and asking for help. More comfortable and focused in tackling Maths. Willing to attempt challenges they do not actually know the answers to – using strategies. Starting to have a positive attitude not only to Maths but are generalising to other learning areas. They are becoming “Can Do Kids”. (2005, NT)

I have enjoyed doing the program and found that the students benefit from doing this. (2006, NT)

*QuickSmart* is effective for students who lost track in mathematics. *QuickSmart* is very well structured, transparent and easy to follow. Whoever is involved in making this fantastic program my congratulations to you all. Excellent job! (2007, Western Region)

*QuickSmart* program has been easily adapted to suit the needs of our students and educational setting. It requires intensive interaction in a non-threatening way. (2007, New England Region)

As a newcomer to this programme I think I expected too much and felt that the students did not progress fast enough. Now at the end of the year I can see the enormous benefits it had on the participants. They feel more confident with their number facts – they had a real sense of achievement and a great boost to their self-confidence. Students that find it hard to stay on task or get much work done in class participated with enthusiasm at *QuickSmart*. The achievement for our disadvantaged students, many with added learning difficulties were quite remarkable. (2007, Lismore Diocese)

Overall the program has been an enormous success. There were a couple of students who did not stay in the program for varying reasons. The 12 students that I finished with put in a lot of effort to be at both school and QS during the time and plenty of rewarding times. I think that the program gives students the leg up that a lot of them didn't get early on in school. It should run in every school. (2007, North Coast Region)

Six comments were coded as ‘positive with qualifications’. Three of them related the need for more instruction, two mentioned that the children find it a bit boring after a while, and one comment highlighted the need to get a commitment from parents so that the children attend regularly.

Examples of comments that were *positive with qualifications*:

After a not so smooth start to our QS program, I feel that it was quite successful. However I would like more instruction on the whole program early next year if possible. (2004, Lismore Diocese)

*QuickSmart* could work extremely well in our school however we have to deal with the attendance issue first. Need to get a commitment from parents that if on this or any other IEP that the children attend regularly. Also with a small school the teachers have to wear many hats and be flexible. Often I was needed to attend to replacing other teachers, to certain crises, work with/supervise other children. (2006, Lismore Diocese)

Easy programme to implement but the kids find it a bit boring after a while, especially if they’ve done it in primary school. (2007, New England Region)

Eight comments were coded as ‘other’. Seven of them were responses that simply stated how many children attended *QuickSmart* or described what the children did in *QuickSmart* lessons. One response offered some general suggestions for making *QuickSmart* more helpful. Three examples of such comments follow:

Four Year 8 students participated in the Numeracy *QuickSmart* Program during the year. (2005, Lismore Diocese)

We had 12 students participating in the literacy program over a period of 20 weeks, 3 sessions a week for ½ hour. We had 9 boys, 3 girls, all Year 5 students. (2006, Lismore Diocese)

It is better to work with younger students so you can fill in the gaps before it gets to big. It is important to make the link between QS and classroom work. We need to do more to help students transfer their QS skills. (2007, North Coast Region)

Only two respondents referred explicitly to *QuickSmart* Literacy program. Both of these responses were very positive:

The children loved it. They really enjoyed the instant graph evaluations of how fast and how many correct they had. Great tool for building upon what children already know. Now I can put theme words into CAAS as well as the 100 most used words to quicken children’s responses as well as reinforcing these words. (2003, North Coast Region)

I have been responsible for the literacy component of the *QuickSmart* program. I have had eight students from years 5 and 6, I have enjoyed both the structure and variety that is part of each lesson. The folders were great to follow with minimum extra resources required. Both the

teachers and students were quick to embrace the program, with positive feedback (2006, Lismore Diocese)

**QUESTION 2:** What effect has the *QuickSmart* program had on the performance of your *QuickSmart* students? Comment on these students' performance in terms of their academic achievement in the classroom, the students' abilities to focus and concentrate on their schoolwork, and their self-esteem as learners.

All responses to this question were positive. There were 42 comments about the increase in students' confidence and self-esteem and improved focus, and 23 responses highlighting the academic achievement of students. There were a further 7 responses with regard to the *QuickSmart* Literacy program, 3 commenting on increased confidence and 4 on academic improvement.

Examples of comments regarding *increased confidence, focus and self-esteem*:

The confidence of all children involved increased dramatically, which in turn ultimately increases their academic output. With many students there was a noticeable improvement in their academic achievement in the classroom, the students' abilities to focus and concentrate on their school work, and their self-esteem as learners. (2003, Lismore Diocese)

The *QuickSmart* program has had a very positive effect on our students. Their academic achievements have risen slightly and we have noticed a significant change in focus, concentration and especially self-esteem. (2005, Lismore Diocese)

Generally students are very proud of the progress they achieve, starting from the very basics and moving through to harder facts and equations. (2006, NT)

*QuickSmart* has had a huge impact on all the students' self-confidence. These students had a big sense of failure, they perceive learning as too hard. They now know learning can be both challenging and fun, and if they keep at something they will get better. I feel that their concentration and focus has improved. (2006, Lismore Diocese)

Self-esteem – all are so much more confident in maths as well as life in general. (2007, New England Region)

*QuickSmart* has helped my students rapidly. They now have the ability to sit and concentrate a lot better. It has broadened their self-esteem, and they can now do/have a go at their school work without getting upset with themselves. (2007, Western Region)

The Year 4 students I instruct were in my remedial maths group in Term 1. They lacked confidence, were reluctant to try anything new and were very hard to motivate. The *QuickSmart* programme has a huge impact on these students. There has been a big improvement in their basic numeracy skills. They are now enjoying maths and are eager and willing to try new things. One student in particular, has had behaviour issues in the past but the increase in his self-esteem has changed his attitude considerably. In a recent maths test he came 7th in the class. (2007, Western Region)

The students enjoyed graphing their academic achievements and seeing their progress gave them the incentive to do even better next time. I was amazed how focussed and with how much concentration they worked through the whole lesson, knowing that a lot of the students have trouble with that in class. Students that started the programme feeling dumb, like losers and unable to achieve soon grew with confidence and could feel proud of their success. (2007, Lismore Diocese)

Examples of comments *stressing academic achievement*:

The confidence of all children involved increased dramatically, which in turn ultimately increases their academic output. With many students there was a noticeable improvement in their academic achievement in the classroom, the students' abilities to focus and concentrate on their school work, and their self-esteem as learners. (2003, Lismore Diocese)

The majority of the QS students achieved fantastic academic result, some advancing 3 bands within the Basic Skills Tests. In-class assessments showed marked improvements also and all Learning Group Teachers noted amazing differences in self-esteem and the willingness to 'have a go' from students previously unwilling to actively participate in group activities. (2005, Lismore Diocese)

Academic – all students improved, some substantially. (2006, Lismore Diocese)

Academic – all have improved. Kids on the lowest level seem to have made the most progress. Focus – I still find you need to be on top of the situation all the time – these students tend to easily revert to old habits. (2007, New England Region)

One of the *QuickSmart* students has progressed to the next English class. She did this through improved exam marks and being more focused. She has also been nominated for a promotion in Maths. Some teachers have commented that the students are more focused and not as easily distracted. Their confidence along with self-esteem grew with each lesson. A student who hated reading out loud now really enjoys it. (2005, Lismore Diocese)

Self-esteem – as their knowledge in numeracy and literacy has improved so too has their verbal classroom contributions, as they are no longer afraid to attempt answers. (2006, Lismore Diocese)

I don't have these students in the classroom, but do know one boy was moved to a higher level English class. The other has expressed more self confidence in his ability to read aloud in the class. (2004, Lismore Diocese)

**QUESTION 3:** With regard to the *QuickSmart* program, what do you think have been the positive aspects of the program?

There were 53 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general). These fall broadly into four categories: positive impact on



students (25 responses), effectiveness of the structure of *QuickSmart* (20 responses), the positive aspect of a particular component of *QuickSmart* program (9 responses) and the fact that the program was enjoyable and easy to implement (2 responses). In addition to that, there were three responses that explicitly referred to the *QuickSmart* Literacy program.

Comments that stress the positive impact of *QuickSmart* on students typically dwell on increased confidence and ability.

Examples of comments *stressing confidence and increased ability*:

Seeing the end results with the students. (2005, NT)

Teaching students who are in need of learning basic maths and the best and easiest way to get the answer. Thinking quickly, organising their minds to have instant answers. (2006, NT)

The positiveness and confidence the kids have shown in class. The kids don't feel dumb anymore with confidence up. (2007, New England Region)

The students now having the ability to deal with aspects of the everyday lives etc. Money, recognition of numbers, place values and helping with numeracy. (2007, Western Region)

Students getting faster, students more confident with multiplication, adding up with different techniques, working things out in head, kids are asking to take them, parents in the community are asking how their students are going and what levels their child/children are on. Students are going home and telling parents. (2007, Western Region)

the most positive thing about *QuickSmart* to me would be watching the kids self-confidence and self-esteem grow as the program went on. (2007, Western Region)

Responses which foreground the structural aspects of *QuickSmart* program typically highlight the *small group or one-on-one teaching*, strategies, and repetition. Some examples of such comments are:

Routine; Short quick learning sessions; Strategies taught in recalling stored information more quickly. (2003, Lismore Diocese)

Working in small groups. Number of sessions per cycle. Students enjoy the program and are always keen to improve. Students also appreciate one to one time. (2005, Lismore Diocese)

A positive aspect is that the students can see they are improving when being timed. Instant feedback helps them to realise where they had difficulties. Repetition of different strategies and working with their partner brings satisfaction and confidence. The expectation of success becomes more evident and actually occurs more often. (2005, Lismore Diocese)

The positive aspects of the programme would have to be how fast and focussed the process of going through the daily programme is. Students liked the competitive nature of the programme (at first). Working as a small group (2) worked well with the children's



competitive tendencies, both with their partner and themselves. (2007, Western Region)

One on one learning. It has to improve any student's learning and confidence. Watching my student go from hating to do a subtraction sum, to ask to do that worksheet. Seeing improvements, that the students are actually obtaining knowledge out of the program. (2007, North Coast Region)

1 on 1 tutoring, rapport with students, being a part of their achievements. (2007, Western Region)

Responses emphasising the positive aspect of a particular component of *QuickSmart* program typically mentioned flash cards, the CAAS program, games, and graph charts.

Examples of comments emphasising the positive aspect of *particular components* of the *QuickSmart* program:

Good results using the CAAS with a student who has cerebral palsy. (2005, NT)

Flash cards are a valuable resource. Repeating operations daily – for all students. (2007, New England Region)

I like the graph charts - they have a visual aspect that the kids respond to well. The children feel good about themselves and it carries on into other subjects. (2007, North Coast Region)

We liked the flash cards, the CAAS program and the games. (2007, New England Region)

Two respondents highlighted the fact that the program was *enjoyable and easy* to implement:

It's a program that I found easy to make enjoyable. (2005, NT)

Was quite easy to get into a habit with. (2005, NT)

The following 3 responses related the *positive aspects* of *QuickSmart* Literacy program:

I've really enjoyed seeing the enthusiasm of the students. They are focussed, keen and learning. They know how the session works and are always organised because if they are on task we should have time for a game. The focus words are excellent, they allow for a scope of activities and they really reinforce their improvements and improve their confidence. (2006, Lismore Diocese)

Intensive work on speed and comprehension. Relationship to subjects- e.g. Reading matter came from actual text books across the curriculum. (2004, Lismore Diocese)

The self-esteem primarily stands out. The timing of activities motivates children. Being able to see improvements visually on graphs stands out to the children. The lack of stigma from the other children. The children on the program talking to one another on the

playground about how they are going. The support given to the other child of the partnership to each other. (2006, Lismore Diocese)

QUESTION 4: With regard to the *QuickSmart* program what do you think have been the negative or challenging aspects of the program?

There were 44 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general) and one response referring to the *QuickSmart* Literacy program. They fall broadly into the following categories: fitting in with school routines (8 responses), time constraints (7 responses), problems with attendance (9 responses), problems with computers (8 responses), problems with funding (5 responses), too hard (3 responses), too easy (3 responses), narrow focus (1 response). In addition to that there was one response specifically related to the *QuickSmart* Literacy program.

Examples of comments regarding *school routines*:

QS has been extremely effective for all involved [as indicated by results]. Obstacles in implementing the programs are interruptions that occur during the school timetable which ultimately affect the consistency of the program. It is also a very demanding job for a teacher with class responsibilities. (2003, Lismore Diocese)

*QuickSmart* lessons sometimes coincide with important deadlines. Inconsistency of equipment – e.g. microphone sometimes fails to work and from time to time doesn't register when the student speaks. (2005, Lismore Diocese)

Taking kids from lessons they don't want to miss. The kids remembering when they have *QuickSmart*. (2007, New England Region)

I feel it is such an important part for their learning program at school but found it very hard to take students out from their class room, when needed. (2007, Western Region)

Examples of comments regarding *time constraints*:

The time constraint, although sometimes being an advantage, occasionally proved difficult to manage with some students who needed a 'settling-in' time when first coming into a QS session. (2005, Lismore Diocese)

The negative aspects of the programme would be in regards to the time spent on setting up the resources, working out timetables around other lessons/stages within my role. Often the *QuickSmart* programme was pushed aside when other school commitments came up. (2007, Western Region)

Not always enough time in a session to play a game. If a student is absent from school a lot then the student falls behind and that does affect their confidence. If one student is having a bad day then that can be a distraction to their partner during a session and affects their concentration. (2007, Western Region)

Examples of comments *stressing attendance problems*:

I think the only negative thing about the program is, when the kids miss a lot of school and you can see the difference with the ones that come all the time, they seem to get left behind then you have to work double time with them. (2007, Western Region)

Teachers refusing to let students leave class when tutors go and get them. It's very challenging to get the older students. Difficult if students away (attendance). Some students only want to go to QS when they dislike a subject. Students refusing. (2007, Western Region)

The most challenging aspects of the program to me would be the high absenteeism with our students. Also another challenging aspect would be time management. Another challenging aspect of the program was the length of the session. By the time the students settle into the lesson the lesson was just about over. (2007, Western Region)

Examples of comments about *difficulties with computers*:

The computer side of the program was always a challenge. Microphone problems were a pain and also scoring on the graphs was not always accurate. (2004, Lismore Diocese)

The CAAS program is great but with multiplication / division it doesn't always show a true result because sometimes the questions are a lot easier than others e.g. 4x1, 7x2 compares with 7x8, 9x9. (2007, North Coast Region)

In regards to the computer it would be much better to be able to check speed and accuracy at the same time. (2007, North Coast Region)

Examples of comments focusing on *problems of funding*:

Uncertain future funding. (2007, Coffs Harbour HS)

Funding has only allowed us a small amount of time 2 x 2 ½ hrs per week for preparation, marking etc. There is a large amount of marking, paperwork to do and time is needed each day to do this. I have also written out records/reports all in my own time (all normal for a teacher, I know). (2007, North Coast Region)

Some comments suggested that the program may be too hard, at least initially: The kids really had trouble doing hard multiplications and the triples as well but other than that they really enjoyed it and made outstanding progress. (2007, Western Region)

Having new students coming in and saying that they can't do this. With time realising they can handle it just as well. It is rather daunting for some at first but as soon as they are confident they enjoy coming. (2007, North Coast Region)

Other comments suggested that the program *may be too easy*:

They find it a bit repetitive. Some have said it should be harder. (2007, New England Region)

repetitive, students can get bored (but some like structure). (2007, Western Region)

One response suggesting that *QuickSmart* should *broaden its focus*:

Prior to attending *QuickSmart* workshop, uncertain whether results being achieved were acceptable. Have found a big negative to be that QS does not cover or assist with all aspects of numeracy being taught in class, but at the same time does help with others, e.g., area/volume require basic multiplication and division. (2006, NT)

**QUESTION 5:** The *QuickSmart* program has been offered as an intense small group intervention in your school. How effective has this been for your students?

There were 47 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general) of which 44 stressed the effectiveness of the program and 3 were neutral, focusing on some of the problems the school experienced in implementing *QuickSmart*. In addition, there was one response referring positively to the effectiveness of the *QuickSmart* Literacy program.

Examples of comments highlighting the *effectiveness* of the *QuickSmart* program:

We have found the program very effective. Working in small groups is a great advantage. We noticed a huge difference in student self esteem and confidence from start to finish. (2005, Lismore Diocese)

Some of our students seemed to blossom when paired with a fellow student and taken out of the large group. (2005, Lismore Diocese)

I believe that if every student had the same opportunities that my *QuickSmart* students have had they would also show confidence and improvement. My kids have really shown me that with one-to-one instruction they are really much better to work with. They love the attention. (2006, NT)

I feel that the students worked well, using small group intervention. It was more personal to their direct need. For a couple of students it helped more with their confidence when answering questions than before. (2007, Western Region)

Very effective, no outside pressure from other students, the student can gain a lot in a small class or one on one in a short period of time. (2007, North Coast Region)

I find it has been very beneficial for my students. They have improved so much since they have been doing *QuickSmart* and I find they have more confidence to try more things. (2007, Western Region)

Working in a small group seemed to work really well with our students. They work really well in pairs especially the kids with low self-confidence. I believe working in small groups helped the process of building their self-esteem as well as the self-confidence. (2007, Western Region)

It's the best way to get results. These students have fallen behind due to not taking in all they need in a classroom environment. This way

they are getting almost one-on-one help. The results show how effective the programme is. The students also help each other out and encourage and acknowledge each other's success. (2007, Western Region)

Examples of *neutral comments*:

Continuation of *QuickSmart* at Batchelor Area, dependent on staffing. (2005, NT)

Because of attendance and consistency issues, not very effective. It would have been helpful to have more training so that lessons could be more diverse and interesting. (2006, Lismore Diocese)

This is our first year this program has been done in our school. There's been ups and downs but we only learn by our mistakes. There's always room for improvement. (2007, Western Region)

One comment focused on the *effectiveness* of the *QuickSmart* Literacy program:

It has been effective because it is small group work. Enabling students to have a 1: 2 ratio to a teacher gives them more courage to ask questions and the teacher is able to monitor more closely exactly what strategic activity the child is carrying out when problem-solving. They are also only risk taking in front of one peer, who they trust not to ridicule. (2006, Lismore Diocese)

**QUESTION 6:** Other comments about the *QuickSmart* program you would like to make. For example, what do you see as the possible future of the *QuickSmart* program in your school?

There were 45 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general) and one response about the *QuickSmart* Literacy program. All of the comments were positive in nature, relating the beneficial aspects of *QuickSmart* on students. The responses were coded into two broad categories: 'positive without qualification' (30) and 'other' (15). Among the positive comments, the majority of responses (21) expressed the wish that *QuickSmart* should continue in their school in the future, three responses mentioned that other students are keen to participate in the *QuickSmart* program, and one response suggested that the program should be developed for other subjects as well.

Among responses coded as 'other', eight made suggestions for the improvement or expansion of the program, five mentioned the issue of funding, and three were of a general nature. In addition, there was one response referring positively to the *QuickSmart* Literacy program. There were no negative comments.

Examples of comments expressing the desire that *QuickSmart* should continue in the future:

We would love to be able to offer this program to a wider group of students as the benefits and results it achieves are immeasurable. This is however dependent on funding and staff availability. (2005, Lismore Diocese)

For the *QuickSmart* program to be run every year. U.N.E. and committee to organise workshops for teacher so they can be exposed to the information and realise that students can benefit within their classes. (2005, Lismore Diocese)

Have found the programme to be very useful and the results for the students achievable and obvious. Instils confidence in the students during numeracy lessons. Would like to see QS continue at DPS and perhaps expand into other relevant areas of numeracy. (2006, NT)

with so many other students wanting and requesting to participate in this program, I hope it continues into next year. (2006, Lismore Diocese)

I would like to see the program run again next year if possible. Seeing the individual outcome of each kid being so positive it would be great to see it again next year!! So even other kids get the opportunity to be in the program and better themselves individually. (2007, Western Region)

The program has given some of the students the self confidence that they lacked. It has helped them improve their learning ability in maths, problem solving and therefore they feel as if they fit into a class better. Most have made new friends in the QS program. I hope the QS program will continue as I can see the benefit to the children and how excited they are to attend the class. (2007, North Coast Region)

Personally I think the *QuickSmart* program is a positive thing for our school and students. I would like to see the program continuing for many years to come. (2007, Western Region)

Continuing this program in everyday classrooms would be positive. (2007, New England Region)

Examples of comments about *non-participating students wishing to attend QuickSmart* lessons:

Remainder of students keen to have a go! (2003, North Coast Region)

A lot of the students ask me if they can go with me when some of the *QuickSmart* don't want to come or are away. I wish I had more hours in the day and could take everyone. All students in the school to do the *QuickSmart* program. (2006, NT)

One response suggested that *QuickSmart* should be *developed for other subjects*:

The program hopefully can only get better with more variety and maybe even introducing more school programs like Science, English. The children need these hands on programs to help build their speed and accuracy which gives them a more positive aspect of fitting in and enjoying getting an education. Hopefully the QS program will keep on going and improving each year. I have personally enjoyed being involved and seeing my students reach their personal best. (2007, North Coast Region)



Examples of comments suggesting *improvement/expansion* of the *QuickSmart* program:

Possibility of training Year 9 students as tutors to reduce teaching load for tutor and increase the number of participants. (2005, NT)

the possibility to work with younger years before social behaviour is so ingrained. (2006, Lismore Diocese)

Open to more students. Increase time. (2007, New England Region)

More interaction as to the subject they are doing in class. Would love to see other subjects implemented. More students involved. (Instructor 2)(2007, North Coast Region)

Big future if funded correctly. More avenues for QS tutors to interact with teachers. More consistent QS training and follow up. (Instructor 5)(2007, North Coast Region)

Examples of comments mentioning the issue of *funding*:

For the QS program to be funded as much as possible as it is a much needed resource. (2007, North Coast Region)

Funding is the biggest problem. Help with that would then help more students. (2007, North Coast Region)

One response referred to the *QuickSmart* Literacy program:

We would be thrilled to implement the program again next year. Staff have been very keen when we conducted in-servicing at the staff meeting. Of course funding is always an issue, but it would be great.

Overall, the responses from instructors were overwhelmingly positive. The majority stressed the positive impact of the program on students – the fact that it was enjoyable, that it improved their academic performance and that it increased their confidence and self-esteem. With respect to the negative or challenging aspects of the program (Question 4), these had mostly to do with time constraints, fitting in with school routines, attendance, funding, and problems with computers.

## Summary of Qualitative Data from Principals

The *QuickSmart* participants have demonstrated increased confidence, speed and accuracy in engaging in literacy and numeracy activities.

(2007, Lismore Diocese)

Principals from 26 schools that used *QuickSmart* between 2003 and 2007 responded to the questionnaire. Below is a breakdown of their answers to individual questions (using NVIVO 7).

**Table G.2: Qualitative Data from 26 *QuickSmart* Principals (2003-2007)**

QUESTION	TOTAL No. OF RESPONSES	No. OF POSITIVE RESPONSES	No. OF NEGATIVE RESPONSES	No. OF NEUTRAL RESPONSES
QUESTION 1: Comment in general terms on the	26	21	1	4



<i>QuickSmart</i> program that has been offered in your school during 200_.				
QUESTION 2: What feedback have you had about the <i>QuickSmart</i> program from your teaching staff and from parents or from participating <i>QS</i> students?	43	42	1	0
QUESTION 3: What effect, if any, has the <i>QuickSmart</i> program had on the performance of the participating students in your school?	29	29	0	0
QUESTION 4: With regard to the <i>QuickSmart</i> students in your school, what do you think have been the significant influences affecting their learning?	26	22	0	4
QUESTION 5: The <i>QuickSmart</i> program has been offered as an intense small group intervention in your school. How effective has this been for the students in your school? Are there other models of implementation that you would suggest are appropriate for this program?	24	21	0	3
QUESTION 6: Other comments you would like to make about the <i>QS</i> program.	14	12	1	1

**QUESTION 1:** Comment in general terms on the *QuickSmart* program that has been offered in your school during 200\_.

Of the 26 principals, 21 answered this question positively (commenting on how useful *QuickSmart* was), 4 answered by giving a description of how *QuickSmart* was used in their school, and one response was negative.

Examples of *positive responses* to Question 1:

As a principal, I've been really thrilled that it means that we're catering for those kids in a way that we probably wouldn't have been. (2003, Armidale Diocese)

It was good to have a very explicit role for the tutor. Other tutors sometimes aren't sure of what they should be doing in the classroom. Tutor was very confident working with all the kids. Developed a sense of ownership for her, helped to build up her expertise. (2005, NT)

The delivery of the program has been excellent. Initial implementation under Anne Bellert's mentoring was well planned. The QS tutor, Mr Peter Brenton, was very professional, organised, and thorough. I received regular feedback and was able to observe the positive impact of the program upon student performance. QS filled an important niche for stage 3 students with specific literacy/numeracy needs. (2006, Lismore Diocese)

A well organised programme to meet the needs of students needing remedial work in maths. Also an opportunity for some students who rarely experience success. (2007, New England Region)

Terrific tool to improve number speed & accuracy amongst senior students who would otherwise struggle throughout secondary school & beyond. (2007, North Coast Region)

I have been extremely impressed with the improvements that have been made by those students who have participated in this program. (2007, Western Region)

Examples of *descriptive* comments:

The programme has been serviced by STL and TAS (Teacher aide special) personnel working through 3 sessions /week, focussing on a group of Yr 4/5 students who achieved poor Numeracy results in the preceding year. (2007, Western Region)

In 2007 *QuickSmart* at this school has been offered to targeted students. We have focussed on Numeracy as we found aspects of the literacy component not as good as the numeracy component. Also by only offering numeracy we were able to give targeted students an intensive *QuickSmart* experience. (2007, Lismore Diocese)

There was also one *negative* comment:

Teachers (STLA) delivered the programme and it was very time consuming. Heavily relies on technology which is not always reliable. Scores, we believe, did not justify the time spent on the programme. (2007, Western Region)

**QUESTION 2:** What feedback have you had about the *QuickSmart* program from your teaching staff and from parents or from participating *QuickSmart* students?

There were 4 responses to this question which were positive in general terms (covering students, parents and teachers), 13 responses related positive feedback from students, 13 responses communicated positive feedback from parents, 12 responses gave positive feedback from teachers, and there was one neutral comment with respect to teachers. There were no negative comments.

Examples of *positive* comments:

All feedback has been extremely positive. (2005, Lismore Diocese)

Very positive feedback from everyone. (2007, New England Region)

Extremely positive from all stake holders. (2007, North Coast Region)

Feedback from parents, students and teachers has been highly positive. (2007, Lismore Diocese)

Examples of *positive feedback from students*:

Kids enjoy the individual attention. They are smiling. They don't kick up and walk out. (2005, NT)

Positive impact on students. Timing of when students do it is an issue but this will be the case with every withdrawal program. (2006, NT)

This was a successful program in our school. Students were comfortable with the tutor and saw maths time as an enjoyable challenge. They grew in self-confidence as the year progressed. (2007, Western Region)

Participating QS students have enjoyed the program "fun, interactive, interesting". (2007, North Coast Region)

Examples of *positive feedback from teachers*:

Teachers have been very positive about the changed attitude of targeted students and the improved work ethic. (2003, North Coast Region)

Teaching staff and parents are happy with the students' improvement in attitude and confidence within the program. (2006, NT)

The tutor felt great satisfaction in seeing the radical progress of her students. The class teacher was delighted with the better numeracy skills students were bringing to other aspects of mathematics. Overall there was a sense of pride and achievement by all clients. (2007, Western Region)

The teaching and support staff have continually praised the programme, the tutor and the obvious improvement in student performance. (2007, Lismore Diocese)

Examples of *positive feedback from parents*:

Parents have been quite positive, and have noticed a difference with their children's application, and wanting to work. They've also noticed that the children are quite happy to discuss what they've been doing [in the programme]. Whereas normally when they ask about what they've done in school, they just say, "Nothing." (2003, Armidale Diocese)

Two parents asked if their children could participate as they'd heard good feedback. (2007, New England Region)

Parents are keen to have students in the program, and want to ensure it continues. Students have participated well. (2007, Western Region)

Parents who were at the morning tea were very positive. (2007, North Coast Region)

Only one response was *neutral*:

Parents non-committal. (2007, Western Region)

**QUESTION 3:** What effect, if any, has the *QuickSmart* program had on the performance of the participating students in your school?

All responses to this question were positive. Some 16 comments related increased confidence, self-esteem, and better attitude of students and 12 responses concentrated on their academic improvement. While all these comments related to the *QuickSmart* Numeracy program, there was one response which talked positively about the *QuickSmart* Literacy program.

Examples of comments about *increased confidence, self-esteem and improved attitude*:

When they're working intensively on something like *QuickSmart*, it gives them confidence because they're not being put on display in front of a whole group of people. (2003, Armidale Diocese)

Increased confidence in using maths concepts within the classroom. (2007, Western Region)

Improved relationships, confidence and self-esteem have been noticed. (2007, New England Region)

QS has become a regular part of many students' numeracy program. With continual teacher feedback and praise many of these students have developed in confidence, participation and determination. Their success in QS provides them with confidence to accept new challenges with support. (2007, New England Region)

Improved their attitude towards math and general demeanour as success is not perceived as unusual. (2007, North Coast Region)

The *QuickSmart* participants have demonstrated increased confidence, speed and accuracy in engaging in literacy and numeracy activities. (2007, Lismore Diocese)

That intimacy means that if you try something and don't quite get it right, it's not as threatening as when you've got the smartest kid in the class sitting there watching you and laughing at you, so I think that the fact that it is small means that they have the chance to take risks and succeed. (2003, Armidale Diocese)

They don't feel overwhelmed. (2005, NT)

Examples of comments *emphasising academic improvement*:

We had a look at the BST results, and most of them seem to have shown good progress. It appeared that in the area where they were working [numeracy or literacy], that's where they showed up better. Possibly even better than we may have expected. (2003, Armidale Diocese)

We believe that it has had a significant impact on their performance levels. Basic Skill Test results reflected this as did school based assessments. (2005, Lismore Diocese)

Student data, work samples, assessment results, teacher observations and student well-being all reflect significant positive results for all

participating students. The majority of students demonstrate transfer of skills into the general mainstream classroom. Two male students demonstrate less improvement, this may be due to specific learning needs. (2006, Lismore Diocese)

Excellent improvement in performance & confidence in number skills. (2007, North Coast Region)

Results are very positive, showing improvements in learning outcomes and attitudes to learning. (2007, North Coast Region)

**QUESTION 4:** With regard to the *QuickSmart* students in your school, what do you think have been the significant influences affecting their learning?

More than half of responses (14) to this question emphasised the structure of *QuickSmart* or particular aspects of the program as the most significant influence affecting the students' learning. Five responses mentioned the influence of the instructor, two mentioned the increased confidence and motivation as significant influences, one mentioned the positive attitude of students to *QuickSmart*, two mentioned prior gaps in learning, and two responses were of a broader nature.

Examples of *positive feedback* about the *QuickSmart* program:

The *QuickSmart* program and structure of the lessons. The 1:1 or small group instruction with these "at risk" students. (2006, NT)

Small intensive groups-providing strategies. Highly skilled tutors. (2006, NT)

The emphasis on personal best and self monitoring through accessing the data in graph format. This established a sense of achievement and set realistic goals. (2006, Lismore Diocese)

One on one support; Continuity; Dedicated/talented facilitators; Parental confidence. (2007, North Coast Region)

The students responded well to the concentrated attention of small group tuition. The three sessions a week of organised work focussed on their personal profile encouraged students to improve their results and take pride in their achievements. We were lucky to have a calm and nurturing tutor running the program. (2007, Western Region)

Being provided with individual attention; Positive and appropriate feedback and praise; Taking ownership of their learning and monitoring own progression; Engagement in activities that are quick, familiar and supported; Setting challenges for themselves without fear of failure or ridicule of others. (2007, New England Region)

Individual and small group tutoring; self monitoring (tracking performance in graphs); explicit teaching of strategies. (2007, Lismore Diocese)

Examples of positive comments about the *influence of QuickSmart Instructors*:

The commitment and dedication of Sue Anne Rendell has been a major impact. Also the fact that they have been able to see their own progress. (2005, Lismore Diocese)

Mentors; Individual/explicit lessons. (2007, Western Region)

As a result of *QuickSmart*, the significant influences have been: a) personal goals; b) relationship to tutor; c) relationship to learning partner; d) inclusion of ICT to record progress. (2007, Lismore Diocese)

Behaviour, attendance, rapport with deliverer, follow up at home. (2007, New England Region)

Two responses mentioned *confidence or motivation* as significant influences:

Increased confidence. Higher motivational levels. (2003, North Coast Region)

Repetition of skills to mastery level increased children's confidence in math across the different strands. Opening pathways for problem solving for students has been invaluable. (2006, Lismore Diocese)

One response related the *positive attitude of students to QuickSmart* as a significant influence:

The kids in our school look at *QuickSmart* as a large privilege, which is nice, because sometimes when you withdraw children, they see it as being because they're dumb. But our kids have been quite happy to do it. (2003, Armidale Diocese)

Two responses referred to learners' *prior gaps in learning*:

Early failure, frustration, poor attitude, continued poor results. Negative attitudes to school. (2007, Western Region)

I am sure that they have missed the basics early in their education. I'm not sure if this is related to early-school learning or if there were circumstances that impacted on their learning in the early years of school. (2007, Western Region)

There were two other comments – one bringing socio-economic background into the picture and the other offering a broad *array of influences*:

ESL/ESD, low socio-economic background. (2006, NT)

Attitude, background, expectations, holes in concept learnt, irregular attendance patterns, positive re-enforcement. (2007, North Coast Region)

**QUESTION 5:** The *QuickSmart* program has been offered as an intense small group intervention in your school. How effective has this been for the students in your school? Are there other models of implementation that you would suggest are appropriate for this program?

The majority of responses to this question (15) stressed the effectiveness of *QuickSmart* for the students who participated in the program. An additional 3 responses related to the effectiveness of *QuickSmart*, but with some qualifications. There was only one response that explicitly (and favourably) compared *QuickSmart* to other programs. Another two responses made implicit comparisons that were positive. Three responses suggested possible improvements.



Examples of responses stressing *the effectiveness* of *QuickSmart*:

Very effective as it has allowed the LD teacher to focus on individual needs of students. (2003, North Coast Region)

Meshing with Normal Classroom/School Activities: It's worked very efficiently. It has run very smoothly and the children seem to have slotted very quickly into the pattern – coming and going. Jenny has just come in and done the job very effectively. (2003, Armidale Diocese)

This program has worked very effectively for the identified students carrying over to their class work. (2006, NT)

Found it to be an effective model of delivery as it targets specific and identified needs of our students. (2007, Western Region)

Very effective – should be sponsored by the DET a la Reading Recovery. (2007, North Coast Region)

We are considering utilising aspects of QS program on a larger whole school scale. (2007, North Coast Region)

Three responses acknowledged (or at least did not doubt) *the effectiveness* of *QuickSmart*, but also offered qualifications:

Very effective especially in terms of confidence. The need for close supervision limits the implementation. (2006, NT)

I am not sure how it could be run otherwise. The problem we face is having the human resources available to do the program. This is a shame as there is no doubt that it works. (2007, Western Region)

Group of 6 students would make it more accessible across the school. (2007, North Coast Region)

There were two examples of *comparison with other programs* (one explicit and one implicit):

I've used a number of intervention programmes, the Freedom programme and the Macquarie Tutoring programme, and I think the beauty of *QuickSmart* is that it works with a computer, and the kids are really happy to do that, and it also monitors their progress really carefully, so we can see if they've gone up or down, it gives them a lot of feedback. I've thought about if the programme is not available [next year], how do we make sure that we're still catering for those kids who would be missing out, kids that we would have nominated for next year, and I haven't come up with a suitable alternative. I think it is probably more effective than any of the other things we've used. (2003, Armidale Diocese)

No – implementation model is good. (2007, Western Region)

Responses suggesting *possible improvements*:

Use Year 10 students as peer tutors. (2005, NT)



Possible use of structure/activities by classroom teachers. (2007, Western Region)

It is difficult to see how it would work in larger groups or classes. (2007, New England Region)

**QUESTION 6:** Other comments you would like to make about the *QuickSmart* program.

Out of the 14 principals who answered this question, 12 offered positive comments, 1 gave a negative response, and 1 asked a question about the *QuickSmart* Literacy program (which could be read as a positive comment about the *QuickSmart* Numeracy program).

Examples of *positive comments* about the *QuickSmart* program

Program fulfils a distinct need for a select group of students. (2006, NT)

A good program which I support. (2006, NT)

A most effective program that is expensive to resource. Significant ongoing funding is crucial. (2007, North Coast Region)

As an isolated rural school with a steady stream of new teachers, this program offered a structured tutorial program that addressed real student needs. The teachers didn't have to organise the work needed to support the tutor and the child's learning. Therefore student needs were addressed in the personalised program, a tutor given explicit advice in supporting the student, and the teacher was relaxed in knowing that significant numeracy problems were being systematically addressed. (2007, Western Region)

Some initial concern over resource development and costs. Further ability to be able to provide staffing without ongoing support. However the QS program is adaptable, engaging and skill specific which is reflected in the increase in student engagement. (2007, New England Region)

Have really enjoyed the opportunity to be involved in the project – have seen a marked improvement in attitude of students, a professional bond developed between staff. Looking to continue into 2008. (2007, Western Region)

Next year we will train more aides in *QuickSmart* to extend application of explicit strategies. With time I would like to adapt the program's literacy component to better suit our students and extend the program into literacy. (2007, Lismore Diocese)

We would like to see *QuickSmart* funded with additional STLA time in schools – 2 days per week, to allow us to expand the program. We have been very lucky to have Sue Rogers manage the program at THS and highly recommend her for Regional Support (2007, North Coast Region)

There was also one *negative comment*:

Very time consuming; Student absence affects success rate;  
Disruptive. (2007, Western Region)

One principal responded with a question about a similar program for literacy:

Is there a similar program to target literacy? (2007, Western Region)

Overall, the responses from school principals were overwhelmingly positive. They stressed the effectiveness of *QuickSmart* and its positive influence on students both in terms of academic students, parents, and teachers that again was overwhelmingly positive (there was only one neutral improvement and increased confidence and self-esteem. They also related the feedback from answer from teachers in one of the schools).

Out of 26 principals only one found *QuickSmart* too time consuming, disruptive, and too reliant on technology. However, even this principal had something positive to say about it, acknowledging that it “increased [students’] confidence in using maths concepts within the classroom” (Question 3).

One extended three part reply to this question dealt with the *QuickSmart* Literacy program:

Judging by the Basic Skills results, our Year 5 children doing the literacy in *QuickSmart* had huge gains. There’s between five and six marks that they should definitely move up between Year 3 and Year 5, and all of our children have made that gain. One of the students on the *QuickSmart* programme had made more than double the expected score in English. And in the maths he’d improved by 57. Even the assessor from Sydney, who I spoke with, and who does this all the time, had never seen an improvement of that size ... it may have been the case that he was able to read and comprehend the test better this time, that may account for that huge improvement.

I’ve had children doing *QuickSmart* who have offered to read in Maths for me now, who would never have done that sort of thing before.

The confidence that those children have, they were wanting to take words home and practice beforehand so that they would do really well in the Basic Skills Test. (2003, Armidale Diocese)

## **Summary of Qualitative Data from Special Needs Coordinators**

Parents and students have been very excited about the results that they have achieved in the *QS* program. Students, in particular, enjoy seeing their progress being graphed. Teachers have commented on student concentration and application in class as a result of the program. Some students have also obtained greater results on class tests.

(2004, Lismore Diocese)

In total 16 special needs coordinators from 15 schools that used *QuickSmart* between 2003 and 2007 responded. Fifteen of them answered the questionnaire and one was

interviewed (2003, St Mary's Armidale). Below is a breakdown of their answers to individual questions (using NVIVO 7).

**Table G.3: Qualitative Data from 16 Special Needs Coordinators (2003-2007)**

QUESTION	TOTAL No. of RESPONSES	No. of POSITIVE RESPONSES	No. of NEGATIVE RESPONSES	No. of NEUTRAL RESPONSES
QUESTION 1: Comment on the <i>QS</i> program that you have offered in your school during this year.	18	18	0	0
QUESTION 2: What effect has the <i>QS</i> program had on the performance of <i>QS</i> students? What feedback have you had about the <i>QS</i> program from principals, parents, students and teaching staff? Has there been any flow-on effect to other aspects of the students' learning or personal development?	19	19	0	0
QUESTION 3: With regard to the <i>QS</i> students in the participating schools, what do you think have been the significant influences affecting their learning?	13	13	0	0
QUESTION 4: The <i>QS</i> program has been offered as an intense small group intervention. How effective has this been for the students in these schools? Are there other models of implementation that you would suggest are appropriate for this program?	16	11	3	2
QUESTION 5: Other comments about the <i>QS</i> program	12	11	1	0

**QUESTION 1:** Comment on the *QuickSmart* program that you have offered in your school during this year.

There were 16 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general) and 2 responses about the *QuickSmart* Literacy program. All of the comments were positive about *QuickSmart*.

Examples of **positive responses** (*QuickSmart* Numeracy or *QuickSmart* in general):

*QuickSmart* has been effective in both motivating and keeping motivated LD students. Results have been encouraging in both time and accuracy. (2003, North Coast Region)

The QS program has many benefits that can be offered to students to improve their literacy and numeracy skills. In addition students in this program also experience a tremendous growth in self-esteem. (2004, Lismore Diocese)

For the students who have been able to fully access the QS program, it has been extremely successful. The program, I believe could work very effectively in a High School environment and benefit a large number of students particularly in Years 7 and 8. The QS program is enormously successful on a number of levels: developing accuracy and fluency in numeracy and literacy, addressing specific skill deficits and most importantly (I feel) developing student self esteem and reversing the cycle of learned helplessness. (2004, Lismore Diocese)

The *QuickSmart* program has been offered to Year 5 students chosen from Year 3 Basic Skill Test results in low bands, and not progressing satisfactorily in Year 4 with no cognitive, social reason. As at the end of 2005, Year 5 student results have been great; students within the area have all had dreadful Learning Difficulties and its success has been exemplary. Facilitator, S.... – highly professional and capable. (2005, Lismore Diocese)

P.... has done a fantastic job working with all the children in the program. Their self-esteem has dramatically increased and they have a more positive approach to school. (2006, Lismore Diocese)

Highly successful for targeted students. Students enjoyed, confidence improved, tutor was excellent. (2007, North Coast Region)

The staff and students of JPC wish to thank UNE and the CEO for the opportunity to run this program. We would like to continue with the program in 2005, if possible, as we believe that it is an incredibly worthwhile program in for students with literacy and numeracy difficulties. (2004, Lismore Diocese)

**QUESTION 2:** What effect has the *QuickSmart* program had on the performance of *QuickSmart* students? What feedback have you had about the *QuickSmart* program from principals, parents, students and teaching staff? Has there been any flow-on effect to other aspects of the students' learning or personal development?

There were 12 responses focusing on the positive impact of the program on students' confidence and self-esteem, and 7 responses emphasising academic improvement. Some respondents covered both increased confidence and improved academic performance. All these responses relate to *QuickSmart* in general. There were no responses specifically addressing the numeracy or literacy strands of the program. All responses were positive.

Examples of comments about the positive impact of the program on students' *confidence and self-esteem*:

*QuickSmart* can and does have a very positive effect on both academic performance and a student's self-confidence. We have observed these changes in a number of students over our past three programs. Teachers also sometimes observe it and a number of parents have made comments in this regard. Students who do not attend school regularly or have a negative attitude re the program, don't have clear positive outcomes. (2005, Lismore Diocese)

P.... has done a fantastic job working with all the children in the program. Their self esteem has dramatically increased and they have a more positive approach to school. (2006, Lismore Diocese)

As previously mentioned, self-esteem has increased. Many other teaching staff have been curious about the program and P.... has taken the time to individually speak to them. All staff have been very supportive. (2006, Lismore Diocese)

Feedback was obtained from students, parents and teachers. Improved performance, self-confidence. Enjoyment of participants. (2007, North Coast Region)

The QS students have, generally speaking, gained in confidence. Some have also improved at their basic maths. Parents are happy about their children doing QS and have seen improvement. Students themselves see improvement also. (2007, Western Region)

#### Examples of comments emphasising *academic improvement*

Parents and students have been very excited about the results that they have achieved in the QS program. Students, in particular, enjoy seeing their progress being graphed. Teachers have commented on student concentration and application in class as a result of the program. Some students have also obtained greater results on class tests. (2004, Lismore Diocese)

The program has had a marked and quite dramatically positive effect on the students. Substantially improved academic outcomes re the Year 5 Basic Skills Tests results. Parents have stopped me to speak highly of not only their child's noticeable academic progression, but also of their improved work ethic and risk taking. The principles/ethics/ skills have been transferred to their learning across the board. In all our students' cases, every child recorded positive results in both speed and accuracy and self-confidence which teachers and parents commented favourably on. Comments were also made re the *QuickSmart* students mentoring other students, thus reaffirming their own knowledge and academic self-worth. (2005, Lismore Diocese)

QS students have in all but 2 cases shown incredible growth in Yr 5 BST from bands 2 to upper 5; assessments in Yr 4 did not indicate this huge progression. From our documentation growth from Yr 3 to Yr 4 in academic progress was evident but minimal! Teachers of these students noted their concerns at the beginning of 2006 in verifying and choosing these students especially following initial Yr 5 assessments in 06. To then gain independent assessment (re BST), 10

out of 12 students attaining band 5 from Yr 3 bands 1 and 2 is a definite testimony to the success of QS support. (2006, Lismore Diocese)

For a lot of children this has been the only positive part of their school year, and they have achieved well. (2007, North Coast Region)

Students enjoy the programme, as I feel that for those struggling students especially boys they do get to achieve, improve and feel success. Classroom teachers feel it's a load off their shoulders in that another person or programme is responsible for the students' individual needs. (2007, New England Region)

**QUESTION 3:** With regard to the *QuickSmart* students in the participating schools, what do you think have been the significant influences affecting their learning?

There were 13 responses addressing the issue of the significant influences affecting student learning. The majority of the comments emphasised the structure of the *QuickSmart* program or specific aspects of it. All responses relate to *QuickSmart* in general. Some examples are shown below:

The immediate feedback to students of results is a great motivating factor. Graphing helps students to see results and account for poor and/or good performances. Timing of activities has also been surprising to students and teachers. Games and beat the timer are very motivating for students. (2003, North Coast Region)

Prior to *QuickSmart*, children who have missed skills knowledge practice/assimilation have resulted in low self-esteem and low confidence and no risk taking etc. After *QuickSmart*, children had basic skills knowledge and learn to 'trust their head' and the value of automaticity. They become 'game' to transfer use of skills into other areas, take risks and see a more balanced equation of risks and the balance of mistakes and progression. They learn to learn! (2005, Lismore Diocese)

The regular 'one-to-one' attention, the specific teaching and drilling of skills and knowledge, the quick response computer program, the feed back – instantly obvious- of how they are progressing, the competition with themselves and with the 'companion' student; the well-planned program – well executed. (2005, Lismore Diocese)

Variety of skills. Use of new technology. Incorporating games into learning. (2006, Lismore Diocese)

Personal attention. Structure. Competition. Rewards. Great atmosphere for learning. Ownership of room and therefore prepared to embrace the program. Excellent tutors/instructors. (2007, North Coast Region)

**QUESTION 4:** The *QuickSmart* program has been offered as an intense small group intervention. How effective has this been for the students in these schools? Are there other models of implementation that you would suggest are appropriate for this program?



There were 11 responses focusing on the effectiveness of the program, 3 responses mentioning some problems that were encountered (with computers, microphone, time, cost, and staffing) and 2 comments suggesting modifications to the program. Some comments mentioned that the program should be offered to a greater number of students. One response refers to the *QuickSmart* Numeracy program and the rest relate to *QuickSmart* in general.

Examples of comments about the *effectiveness* of *QuickSmart*:

The best parts of the program were the set structure of the sessions. They provided a clear framework and I really appreciated having all the support materials necessary to follow the format, in most part, ready made. The short sharp segments of each session kept the motivational level high and the time wasting episodes to a minimum. The CAAS was an interesting tool for both the students and I to gauge and track progress. However, it did become repetitive and a bit drab. (2003, North Coast Region)

The intense small group intervention has been extremely effective. (2004, Lismore Diocese)

Extremely effective, and not just in terms of 'graphed' academic progression. In the case of some students, QS has certainly assisted the student, but also helped to clarify for teachers and more importantly for parents, where some learning challenges come into play affecting their child's progression. (2006, Lismore Diocese)

Found this model good but it would be great to reach more children. (2007, North Coast Region)

Students have improved time and accuracy and understanding of basic skills. But when it comes to working mathematically they don't always carry over the new learnt skills and with most students especially boys they are very visual learners. (2007, New England Region)

Model proved effective. (2007, North Coast Region)

Three responses mentioned *problems during implementation* of *QuickSmart*:

Problems with the program software and also the hardware were frustrating (our microphone let us down a few times and the ugly results showed themselves on the graphs – something the children did not like happening). (2003, North Coast Region)

Issues that have been encountered at JPC: Great problems with accessing the CAAS program. E.g. – The microphones had to be installed each time we ran the CAAS program. Staffing difficulties: possible solutions – do not involve the Student Services Co-ordinator in running the program as that person is often unavailable due to meetings or staffing issues. Use permanent staff who are not involved in too many other school tasks. One trained 'back-up' person would be good who could work with all groups occasionally to keep up to speed and fill-in when necessary. (2004, Lismore Diocese)



Excellent concept, developing the automaticity (love the expression ‘trust your brain’ – that’s been really useful). Would like to see how much higher the results could be for a) older b) more ‘average’ (rather than low ability) students. Time/cost effectiveness most problematic – takes quite a long time to instil basics and nowhere near “finished” (i.e. all tables plus quality input into addition and subtraction) with only 12 students catered for. (2007, Western Region)

Three comments suggested *modifications to the program*:

I think that sometimes it would be good if there was some way that the kids could meet with other children doing *QuickSmart*. Not just at the end, but as they are going along. And for children to share their successes more with each other. So when they return to the classroom, there is no-one else to feed back off, but if you had a way, perhaps through the internet, for children to communicate, [and say] “this is how I’m going, how are you going?”, that would be good. And the same for teachers. I also think it would be nice to see some children who have done *QuickSmart* become the teachers for younger children too, as a variation of the program. So if children become proficient at something, it would be good if they could then demonstrate it to other children. Because I think that these children don’t often get to play that role. (Interview, 2003, Armidale Diocese)

May be possible to adapt to groups of say, 4, where pairs test each other on fast facts etc, while teacher does 2 students through the computer component. (Would need some adjustment via provision of answers so 2nd student-as-teacher knows the answers are correct). Other independent work, speed sheets and games could all operate well en-masse. Another alternative could be as above, with computer component deleted until another time e.g. build in an extra 15-20 minute session in the week to test all 4 students. (2007, Western Region)

Very effective for the chosen students, although if their partner is away, they are reluctant to come. Some students get bored with the routine. Some more problem solving would be good. (2007, Western Region)

**QUESTION 5:** Other comments about the *QuickSmart* program.

There were 11 positive comments and 1 comment suggesting the use of pen and paper rather than computer testing. One comment relates to the *QuickSmart* Literacy program and the remainder to *QuickSmart* in general (i.e., they do not specify which strand of the program they are talking about).

Examples of *positive comments* about the *QuickSmart* program include:

QS is time consuming but is motivating for students in a positive way. I would like more flexibility in CAAS assessment. Support material is very good. (2003, North Coast Region)

Thank you, it’s a fabulous program. (2004, Lismore Diocese)

Fantastic – how about Educational Office Administrators – those that ultimately review the feedback pending decisions re \$\$ and continuation – visit us and see children in action and conference at the coalface to sample real experience. (2006, Lismore Diocese)

It has worked/been more successful than I initially thought it would be. I think this comes down to committed instructors and good organization in the planning stages. (2007, North Coast Region)

It's a shame more students could not have been involved. (2007, North Coast Region)

One comment suggested the use of pen and paper rather than computer testing:

CAAS testing is all non-concrete – no written work, no visuals. Most students who are low in academic development need to use pen and paper. The speed sheets etc are very appropriate and low achieving students have poor recall. (2007, New England Region)

One comment related to the *QuickSmart* Literacy program:

This year we gave concerted time and effort to teachers to become familiar with QS on more than a theory basis. Discussions, power point presentations compiled by myself to indicate rationale behind QS, viewing and interacting with a QS lesson gave rise to all teachers extolling its virtues. Questions were raised re linking to writing – for me as LSC it also indicated the difficulties many teachers seem to have with the 'continuum' of literacy with repetition, timed tasks, risk-taking, and most notably the holistic view of 'good' literacy teaching. This is not to discredit teachers – but to 'wider' professionals to facilitating the 'facilitators' of literacy in our schools. (2006, Lismore Diocese)

The responses from special needs coordinators were all positive. They stressed that the program improved students' academic performance and increased their confidence and self-esteem. They commented favourably on the structure of the *QuickSmart* program and on the specific aspects of it. A small number of respondents mentioned problems with timing, funding, staffing and computers.

## **Summary of Qualitative Data from Classroom Teachers**

In a way it's been a Godsend, because it allows children to have their needs met in a way that we can't always provide in the classroom. So it's been a really useful part of their individual education programme. It's given them a lot of support and a lot of confidence in quick recall of things and basic understanding of how we do things and why. Which is great.

(2003, Armidale Diocese)

In total 72 classroom teachers (whose classes the *QuickSmart* students were in) from 31 schools that used *QuickSmart* between 2003 and 2007 responded. Sixty-five of them answered the questionnaire and seven were interviewed (2003, 2 Armidale

Diocese Primary schools). Below is a breakdown of their answers to individual questions (using NVIVO 7).

**Table G.4: Qualitative Data from Classroom Teachers (2003-2007)**

QUESTION	TOTAL No. OF RESPONSES	No. OF POSITIVE RESPONSES	No. OF NEGATIVE RESPONSES	No. OF NEUTRAL RESPONSES
QUESTION 1: Comment, in general terms, on the <i>QuickSmart</i> program that has been offered in your school during 200_.	70	63	1	6
QUESTION 2: What effect, if any, has the <i>QuickSmart</i> program had on the performance of the <i>QS</i> students in your class? Please comment on these students' performance in terms of their academic achievement in your classroom, the students' abilities to focus and concentrate on their schoolwork, and their self esteem as learners.	88	86	2	0
QUESTION 3: With regard to the <i>QuickSmart</i> students in your class, what do you think have been the significant influences affecting their learning?	54	49	0	5
QUESTION 4: The <i>QuickSmart</i> program has been offered as an intense small group intervention in your school. How effective has this been for the students in your class? Can you think of any obstacles or disadvantages to implementing the <i>QuickSmart</i> program in schools?	64	29	34	1
QUESTION 5: Other comments about the <i>QuickSmart</i> program. For example, what perceptions of the program were held by non-participant students? What was their attitude towards the <i>QuickSmart</i> students?	52	43	2	7

**QUESTION 1:** Comment, in general terms, on the *QuickSmart* program that has been offered in your school during 200\_.

There were 64 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general): 51 answers were straightforwardly positive, 7 answers were positive with some qualifications, 5 answers were merely descriptive, and there was 1 answer focusing on difficulties with running the program. In addition, there were 7 responses referring to the *QuickSmart* Literacy program: 5 straightforwardly positive replies and 1 neutral comment.

Examples of **positive comments** (*QuickSmart* Numeracy or *QuickSmart* in general):

The self-esteem, the strategies, the whole *QuickSmart* experience has been such a positive one. If it can be run again, then it should be. (2003, Armidale Diocese)

I think the programme has something about it that makes the kids willing to do it, and that's a big plus. If they can see the value in it, and have some ownership of the learning, that keeps them keeping on. I don't have anything negative to say about it, at all. It's done so many wonderful things for the students. (2003, Armidale Diocese)

In a way it's been a Godsend, because it allows children to have their needs met in a way that we can't always provide in the classroom. So it's been a really useful part of their individual education programme. It's given them a lot of support and a lot of confidence in quick recall of things and basic understanding of how we do things and why. Which is great! (2003, Armidale Diocese)

Fantastic! Children greatly benefited. Can see an improvement in all. (2005, Lismore Diocese)

The *QuickSmart* program seems to be well received by the students. They seem to enjoy going to QS and non-participating students accept it as normal. It seems to have been well organised with the students knowing when they had QS and being organised themselves to go directly to QS. (2005, Lismore Diocese)

It is an excellent method of developing numeracy skills for children who need a structured one-on-one Maths program. It also gives the instructor the opportunity to help each child use various learning strategies whether they be pictorial or hands on. (2006, NT)

It has been received by the children with great enthusiasm. I believe the students developed an increased confidence in their literacy/numeracy ability. (2006, Lismore Diocese)

The *QuickSmart* is extremely effective within our school. The implementation of this program has advanced students in both mathematics and other curriculum areas by increasing information processing and lateral thinking skills. (2007, New England Region)

The *QuickSmart* programme has been excellent for the children involved. They love the lessons and are far more confident to have a go in maths lessons. (2007, Western Region)

Offered to some of my Yr5, Yr6 and Indigenous students. Students showed an improvement in speed at solving basic number facts. The greatest improvement was in their attitude to mathematics. (2007, North Coast Region)

*QuickSmart* has been an excellent programme to develop our Koori students' skills in Maths. As we are a small school many students have benefited from QS. (2007, Lismore Diocese)

Seven positive comments about *QuickSmart* were qualified: 2 of them suggested that the program is constrained to too few students, 2 mentioned that it helped some

students but not others, and 3 *addressed problems* with the use of computers, resources, and disruptions of normal school routines:

The programme should have been offered at a whole school level so that all teachers are aware of the programme, its components and the outcomes it is aiming to achieve. (2007, Western Region)

It is a valuable programme but it is constrained to too few students. (2007, New England Region)

We've had mixed results with a couple of children. I don't think they've gone backwards, but they haven't made the progress that the other children have made. But that's indicative of what they're doing in the classroom anyway. So it's not a failure of *QuickSmart*, it's one of those situations where they were probably borderline choices. (2003, Armidale Diocese)

6 students participated in QS. For 2 of those children it was good because they wanted to learn, for the other 4 I feel that it didn't help them at all, they don't seem to be interested in learning anything in a normal lass. (2007, North Coast Region)

*QuickSmart* has been a worthwhile program that has delivered some very worthwhile outcomes for the 12 students involved at Buronga. However, there has been a number of frustrating aspects to the program. Primarily these have been: Hardware and software difficulties with CAAS. Administrator access being only way to install. Loss of data and temperamental nature of microphones. Loss of hardware due to malfunction & conceptual loss of student history; Resource (time/personnel) commitment to run program. (2007, Western Region)

A purportedly successful program that creates disruption in terms of both teaching and continuity and student behaviour. (2007, Western Region)

Concept is good – perhaps these programs need to be done in primary schools so the students are better prepared for high school. Some of the students (not in bottom class) are missing important sections of new topics, which makes it difficult for them to cope. (2007, North Coast Region)

Examples of *descriptive* comments:

Two of the female Indigenous students were removed from their normal maths classes for half an hour three times a week. These students worked intensively with a school assistant/tutor. (2006, NT)

*QuickSmart* has offered 5 children in my class some time to spend on either literacy or numeracy topics. (2006, Lismore Diocese)

One response focused on *difficulties with running the program* (*QuickSmart* Numeracy or *QuickSmart* in general):

The mechanics of running the program have caused some issues. Considerable student and teacher absences have made regular sessions difficult. (2007, Western Region)

Examples of *positive comments* about the *QuickSmart* Literacy program:

It appears to be helpful. (2003, North Coast Region)

The Literacy program has been very beneficial to the children involved. I'd love both literacy and numeracy to be offered in 2007 though. The children love it and the results for most have been very positive. (2006, Lismore Diocese)

Excellent remedial program for students lacking numeracy/literacy skills. (2007, North Coast Region)

There was also one *neutral comment* (*QuickSmart* Literacy program):

Only one of my students attended the *QuickSmart* Program, so it is hard to reflect in general terms. This student also attended a small group literacy class. I found the timetabling of the program interfered slightly with the particular student and this wasn't taken into account. (2005, Lismore Diocese)

**QUESTION 2:** What effect, if any, has the *QuickSmart* program had on the performance of the *QuickSmart* students in your class? Please comment on these students' performance in terms of their academic achievement in your classroom, the students' abilities to focus and concentrate on their schoolwork, and their self esteem as learners.

There were 72 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general): 45 responses mentioned the increase in confidence, self-esteem and focus of students, 25 stressed the academic achievement of students, and 2 responses indicated that the program was less effective than what the teacher expected. In addition, there were 16 responses referring to the *QuickSmart* Literacy program: 13 commented on an increase in confidence, self-esteem and focus and 3 mentioned academic achievement.

Examples of comments about increase in *confidence, self-esteem and focus* of students (*QuickSmart* Numeracy or *QuickSmart* in general):

*QuickSmart* is building their self-esteem. They're actually feeling good about themselves because they can do something. The two little girls are very confident when it comes to the maths. With things we are doing in class, they'll say, "Yes, I can do that". (2003, Armidale Diocese)

The increases of confidence for the high school students has been great. I've made time tables practice part of daily routine for my class. (Secondary Teacher, 2005, NT)

Self-esteem improved. Academic achievement improved. Focus/concentration improved. (2006, Lismore Diocese)

The *QuickSmart* program has allowed the children in my class who were struggling with basic concepts to better understand these



concepts and become more confident in their maths. (2007, Western Region)

I have certainly noticed the level of confidence of these children who have attended QS has risen dramatically. They enjoy challenges in areas and do not show the anxieties in tests that they had been displaying before QS. (2007, Lismore Diocese)

The *QuickSmart* program has definitely increased students' self-esteem across all curriculum areas. The motivation of advancing through stages and the students tracking their own success through the program is motivating to all students. Concentration has also increased across all subjects and efficiency in answering questions has definitely increased. (2007, New England Region)

There was improvement in the numeracy skills of all participants. Students gained an increased ability to remain on task and to recognise and achieve set goals. Students' self esteem showed a distinct improvement. They were eager participants in the program and showed more confidence in class lessons. (2007, North Coast Region)

The main benefit I have noticed is that the students return to the class with an enthusiastic approach to their learning and their self-esteem and confidence is booming. (2007, Lismore Diocese)

Examples of comments stressing *academic achievement* (*QuickSmart* Numeracy or *QuickSmart* in general):

With the five minute test, one boy has gone from getting scores in the 80s and 90s, to getting 150 every time. We actually had to come up with a different reward system! He's not panicking anymore, whereas he tended to panic before. He knew the stuff, but he couldn't get it down on paper. Now it just seems to flow out. (2003, Armidale Diocese)

All areas of most students' learning have increased and they enjoy going to *QuickSmart*. The very small minority that have not engaged fully can be difficult at times and this is reflected in their results. Note: Twelve months after the *QuickSmart* program last year and those students have maintained and progressed very well. (2006, NT)

Academic – a general improvement has been noticed through most students, however a lot of this is due to higher self esteem and being internally motivated to focus for longer periods of time. (2006, Lismore Diocese)

Students developed confidence in maths and other subjects. They were able to carry over skills/strategies to Maths class activities. I observed students increase in speed in number calculations/"tables". You could literally see the students "stop and think". 3 of the 5 yr 5 students who sat the BST achieved higher than expected. (2007, New England Region)



Students are able to participate within the classroom learning new concepts. Before they were passive spectators within the room. (2007, Western Region)

Improved scores in mental activities and solving algorithms. More tasks completed. No more ‘can’t do this’ attitude. (2007, North Coast Region)

Two responses indicated that the program was *less effective than expected* (*QuickSmart* Numeracy or *QuickSmart* in general):

For 2 it helped them because they could answer questions in class. The other 4 they couldn’t care less – a waste of time and money. (2007, North Coast Region)

No noticeable effect. (2007, Western Region)

Examples of comments about *increase in confidence, self-esteem and focus* of students (*QuickSmart* Literacy):

It helped self-esteem. Most kids happy to read and “have a go” at Year 5 reading material. (2003, North Coast Region)

One of my *QuickSmart* students is now really keen to read out loud. “I’ll read, I’ll read!” And even though they still struggle, they’ll do it, and are not embarrassed about doing it. (2003, Armidale Diocese)

K’s comprehension has improved. Her ability to recall information has also improved. She appears to be confident when reading aloud in class. L’s concentration has improved. She doesn’t get distracted as easily as the start of the year. (2005, Lismore Diocese)

*QuickSmart* has definitely improved all children’s self-esteem. They have improved in the areas the specific children have been attending. The children in the literacy classes have been able to focus longer and produce work of a higher standard for each individual student. (2006, Lismore Diocese)

Literacy *QuickSmart* children are also more confident although academically I haven’t seen as much improvement as maths students. However their reading is certainly quicker and more phrased and fluent. (2007, Lismore Diocese)

Examples of comments stressing *academic achievement* (*QuickSmart* Literacy):

One boy we have, he’ll work, but we’d only been able to get surface level stuff from him. And when he was going to *QuickSmart*, he was bringing back results of 100% accuracy, and J.... was saying, “Wow! He has really got it”. And I said “well, I wish he’d bring it to class!” But it showed him that he was capable of more. And it’s starting to filter through into his work now, where instead of getting only five sentences for an information report or something, I’m starting to see more detail and more in-depth stuff, to show that he understands what he’s read, and that he can paraphrase it. His reading has become more fluent. (2003, Armidale Diocese)

K.'s comprehension has improved. Her ability to recall information has also improved. She appears to be confident when reading aloud in class. L's concentrations has improved. She doesn't get distracted as easily as the start of the year. (2005, Lismore Diocese)

Children showing improvement in reading, writing and spelling (very fluent reading). Self-esteem – positive – children feel more confident in the classroom. (2006, Lismore Diocese)

**QUESTION 3:** With regard to the *QuickSmart* students in your class, what do you think have been the significant influences affecting their learning.

There were 48 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general): 20 stressed the increased confidence and motivation of students as the most significant influence, 15 emphasised the structural features of the *QuickSmart* program, 12 mentioned academic improvement as a significant influence, 2 responses highlighted interpersonal relations, and 5 focused on prior deficiencies in students' learning or background. In addition, there were 9 responses relating the significant influences affecting learning during the *QuickSmart* Literacy program.

Examples of comments about increase in *confidence and motivation* (*QuickSmart* Numeracy or *QuickSmart* in general):

Improved confidence in their own ability. They are able to measure their successes. (2005, Lismore Diocese)

Their motivation to want to do the programme. (2006, Lismore Diocese)

Boost in confidence. More prepared to have a try and trust answers that come to mind. Don't feel so exposed in maths sessions. (2007, Western Region)

Students have been reluctant learners, as they have been embarrassed about the gaps in their learning. They now participate more as they are proud of what they know. (2007, Western Region)

Development of a positive attitude towards learning is the key to learning in terms of the QS program. (2007, New England Region)

A new confidence which allows them to 'have a go' in normal lessons in the classroom. (2007, Lismore Diocese)

Examples of comments stressing *positive aspects* of the structural features of *QuickSmart* (*QuickSmart* Numeracy or *QuickSmart* in general):

One-to-one instruction. Learner focus. Student engagement. (2006, NT)

Mentor/role model. Consistent regular practice. (2007, Western Region)

I think have a time out of the room in a very small group where each particular task is monitored closely in a friendly supportive way has given them great encouragement to keep trying and keep focussed. I think they also respond to the short timed tasks. (2007, Lismore Diocese)

Individual attention: expression of caring and the expression of healthy love that the tutors show towards the students. (2007, Western Region)

The computer orientated approach appeals to the students. Also, the positive approach to the program keeps the student enthusiastic. (2007, New England Region)

Examples of comments stressing *academic improvement* (*QuickSmart* Numeracy or *QuickSmart* in general):

Improved basic skills and self-esteem (2007, Western Region)

Enthusiastic about going, fun, they feel they are improving – backed up by statistics. (2007, Lismore Diocese)

They are processing faster. They believe in themselves and their ability to learn. They have a positive attitude to learning and can even work independently in some areas. (2007, Lismore Diocese)

Faster recall – this just makes maths so much easier. (2007, Lismore Diocese)

They are achieving success at their own level. (2003, North Coast Region)

Two examples emphasised *interpersonal relations* (*QuickSmart* Numeracy or *QuickSmart* in general):

Relationship with teacher (safe learning). One on one focus. Feedback through QS timing, graphs etc. (2007, North Coast Region)

The daily achievement of personal goals proved to be very popular with the students. The relationship with Mrs Field was very positive. (2007, North Coast Region)

Examples of comments *about prior deficiencies* in students' learning or background (*QuickSmart* Numeracy or *QuickSmart* in general):

Lack of confidence with a low level of maths ability. (2007, New England Region)

The most significant influence that has affected their learning in the past is the lack of concentration and behaviour. (2007, Lismore Diocese)

Little or no support and encouragement from home. Poor organisational skills and basic maths skills. High absenteeism and lateness. Low expectations from themselves and others. (2006, NT)

Each child from my class has had different things affecting their learning. One child has dyslexia and the others are slow learners. (2006, Lismore Diocese)

Examples of comments about *significant influences* during the *QuickSmart* Literacy program:

The one on one learning is invaluable and something that cannot be provided within the classroom. I believe nothing can compare with this time. (2005, Lismore Diocese)

Improved self-esteem. (2005, Lismore Diocese)

The positive attitude to doing the course. (2006, Lismore Diocese)

Feeling valued as individual learners, feeling their problems have been monitored and attended to. (2007, North Coast Region)

**QUESTION 4:** The *QuickSmart* program has been offered as an intense small group intervention in your school. How effective has this been for the students in your class? Can you think of any obstacles or disadvantages to implementing the *QuickSmart* program in schools?

There were 53 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general): 22 elaborated on the effectiveness of *QuickSmart*, 1 mentioned no improvement apart from increased confidence and motivation, and 30 commented on obstacles and disadvantages to implementing the program. Furthermore, there were 11 responses related to the *QuickSmart* Literacy program: 7 stressed its effectiveness and 4 dealt with obstacles and disadvantages.

Examples of comments about the *effectiveness* of the program (*QuickSmart* Numeracy or *QuickSmart* in general):

Effective – as it gives these students a sense of achievement. (2003, North Coast Region)

Meshing with Normal Classroom/School Activities. It was so unobtrusive. J.... would come, I'd see her in the morning, and the kids would go in and out of class. They knew when it was their turn. There was never any disruption in the classroom. It was over before I knew it had started. It worked brilliantly. Sometimes kids coming in and out can be distracting, but I didn't find that with *QuickSmart*. It just flowed very easily. (2003, Armidale Diocese)

Again, I feel *QuickSmart* was a positive influence and the children have improved in many different areas of learning. (2006, Lismore Diocese)

The students have both benefited from QS and enjoyed the individual attention and relationship they have developed with their tutor. (2007, Lismore Diocese)

Small class instruction is fantastic. Students get explicit and systematic support in a non-threatening environment. (2007, Western Region)

It has been effective as a 1:1 exercise to enhance students' mathematical thinking and processing skills. (2007, New England Region)

It has been very effective, particularly noticed it is easy to teach whole class as QS kids are able to keep up and have a go. Can be a bit disruptive having kids come and go during class. (2007, Western Region)

One response conveyed *no improvement except for increased confidence and motivation* (*QuickSmart* Numeracy or *QuickSmart* in general):

I haven't noticed any major improvements – although they may feel more motivated and more confident within themselves. (2007, North Coast Region)

Of the 30 responses addressing the obstacles and disadvantages to implementing the program, 13 mentioned disruptions to school routines, 4 talked about timing issues, 3 mentioned the problems of logistics, 3 talked about funding, and one each mentioned communication, behaviour, absenteeism, school culture, and the need to involve more students.

Examples of comments about *disruptions to school routines* (*QuickSmart* Numeracy or *QuickSmart* in general):

Obstacles have been school disruptions and that students have missed out on space and measurement strands of their maths work. (2003, North Coast Region)

Even if they do happen to miss something in class, I think the benefits of what they are doing in *QuickSmart* are major benefits. (Interview, 2003, Armidale Diocese)

Honestly, the only problem I can see is probably the timetabling, getting it to fit in with the classroom teachers. (Interview, 2003, Armidale Diocese)

It can be disruptive. Students miss same lesson each time out for *QuickSmart*. Teachers need to make sure they program appropriately for these times. This is difficult as many children are missing many times. (2005, Lismore Diocese)

The only disadvantage I found was that the children were missing the class curriculum. However, I understand that the skills they are developing will benefit them in the long run. (2006, Lismore Diocese)

Disruption in program due to other activities going on. Overall the program has been successful for the 4 students from my maths class. (2007, Western Region)

For the children in my class this has been largely successful. They feel good about going and look forward to it. The only disadvantage I can see is with children leaving one or two at a time when you can have 6 children on the program is that there are more interruptions with class instruction. (2007, Lismore Diocese)

I think this is a much better way of teaching maths and it would be great if this could be done with all students. It takes away the variables that exist in the classroom – outside distractions such as noise, behaviour issues, friends nearby etc. A disadvantage would be that the students are removed from a lesson which can disrupt their learning. (2007, Western Region)

Examples of comments about *problems of logistics, timing and funding* (*QuickSmart* Numeracy or *QuickSmart* in general):

Staffing, attendance of students, space available, too many students need it. (2006, NT)

Mixing of students needs to be carefully monitored. (2007, Lismore Diocese)

Timetabling seems to be an issue with all extra-curricular activities, because students shouldn't be missing mainstream classes if they are capable of conceptual understanding. (2007, New England Region)

Just time tabling, so students don't miss key explanations in outcomes and other areas of entitlement. (2007, Western Region)

Yes, the funding for a teacher to implement the programme. (2006, Lismore Diocese)

Funding for staffing. (2007, Western Region)

Examples of comments about *communication*, *behaviour*, *absenteeism* (*QuickSmart* Numeracy or *QuickSmart* in general):

It seems to me some children really benefit and others only do minimally. All improve self-esteem and attitude. I'll be interested to see if these children retain these over the next 6 months after finishing the programme. Also I believe a programme like this is very limited if the classroom teachers aren't aware of what happens in the programme and so can't always support the learning in the class. (2007, Lismore Diocese)

Don't let the kids who muck up in class participate in QS. Only help those kids who really want to be helped. (2007, North Coast Region)

The one on one attention students receive has improved their mathematical ability, their individual confidence the overall attitude to education. Absenteeism has made it difficult for the continuity of the program. Also, it has disrupted some other programs slightly. (2007, New England Region)

Culture of mediocrity in the school; children often feel 'bad' as they are teased for excelling by other students; children are often withdrawn from class – perhaps it could be implemented within the classroom so that participants understand the 'Big Picture'. (2006, NT)

I think it has been effective but it would be wonderful to have all students involved. (2007, North Coast Region)

Examples of comments about the *effectiveness* of the *QuickSmart* Literacy program:

Effective in catering for varied needs. Relation and therefore transfer of knowledge to classroom curriculum. (2005, Lismore Diocese)

Again, I feel *QuickSmart* was a positive influence and the children have improved in many different areas of learning. (2006, Lismore Diocese)



The students have both benefited from QS and enjoyed the individual attention and relationship they have developed with their tutor. (2007, Lismore Diocese)

I think it definitely builds their confidence. With Literacy, it helps with general sentence structure. Only obstacles are that we don't have enough people trained to implement it. (2007, Lismore Diocese)

Four responses focused on the issue of *obstacles and disadvantages* (*QuickSmart* Literacy program):

The students when removed from the lesson do have some difficulty catching up on what has been missed, especially novel reading. (2005, Lismore Diocese)

Great – very effective. Withdrawing children can be a disadvantage because children miss out on current lesson content e.g., leaving maths lesson where content is covered quite quickly. (2006, Lismore Diocese)

No (2006, Lismore Diocese)

Small groups work well but some students were hostile due to the feeling of isolation at being singled out. (2007, Western Region)

**QUESTION 5:** Other comments about the *QuickSmart* program. For example, what perceptions of the program were held by non-participant students? What was their attitude towards the *QuickSmart* students?

There were 48 responses related to the *QuickSmart* Numeracy program (or *QuickSmart* in general): 16 responses conveyed the desire of non-participating students to do *QuickSmart*, 22 related positive or neutral attitudes from non-participating students, 7 teachers did not observe any commentary from non-participating students, 2 comments indicated some negative attitudes, and 2 comments described the positive attitude of participating students and parents, respectively. In addition, there were 3 responses describing a positive attitude of non-participating students by teachers involved in the *QuickSmart* Literacy program.

Examples of comments about *non-participating students* wanting to join the program (*QuickSmart* Numeracy or *QuickSmart* in general):

Other students wanted to join in. (2003, North Coast Region)

I've had a couple of other children say to me, "Why can't we do *QuickSmart* too?" (2003, Armidale Diocese)

"We want to go to *QuickSmart*" – I just wish I could send them all. (2006, NT)

All of my class were interested in what the 4 students were doing during *QuickSmart* and wanted a go at the program. (2007, Western Region)

All of the children loved it. All children wanted to do it when anyone was asked to make up a session. (2007, Lismore Diocese)



Non-participants are intrigued and keen to experience the program because they are continually hearing positive feedback from participants. (2007, North Coast Region)

Examples of positive or neutral *comments from non-participating* students (*QuickSmart* Numeracy or *QuickSmart* in general):

*QuickSmart* is a popular program. All the children, participants and non-participants, view the program in a valued way as far as I am aware. (2005, Lismore Diocese)

I was surprised to see that there were very little negative remarks by other children in the class toward the QS students. (2006, Lismore Diocese)

No evidence of any perceptions other than a general curiosity. (2006, Lismore Diocese)

Other students weren't really fazed. (2007, Western Region)

Hasn't impinged on maths class time too much. No evidence of any negative response from others as students go to and from their *QuickSmart* lessons. It has been 'normalised' quite well. (2007, New England Region)

Other students felt that QS students were lucky. It wasn't regarded as a remediation by most. They were impressed by QS students' achievements and very happy for them. QS students enjoyed sharing their experiences and skills/strategies. (2007, New England Region)

Non-participant students have been very supportive and encouraging. (2007, Western Region)

Examples of responses where the teacher *did not observe any commentary from non-participating* students (*QuickSmart* Numeracy or *QuickSmart* in general):

Normally, if you withdraw kids from the group, the other kids kind of put them down -"you're dumb". But that never happened, because they were always coming back in so happy. (Interview, 2003, Armidale Diocese)

I haven't noticed or am aware of any comments by other non-participants. (2006, Lismore Diocese)

Sorry, don't know as I didn't receive any feedback directly but I have not noticed any adverse attitudes. (2007, New England Region)

I did not see/hear any other students making any comments about the QS students. (2007, Western Region)

Two responses relayed *positive attitudes* of participating students and parents (*QuickSmart* Numeracy or *QuickSmart* in general):

The kids were happy to participate. They loved going. "I'm off to *QuickSmart*!" or "I've just come back from *QuickSmart*!" They haven't taken it as "Well, I've been chosen for *QuickSmart* because I'm dumb". They just seem to love it all! (2003, Armidale Diocese)

The parents from last year's group were very happy. I know one of our parents this year initially came to me and said, "Are you telling me my child is a dummy, that they have to do this?" I said "What I'm trying to do is to sort out [some problems] and I'm hoping this will help your child." And that mother is extremely pleased with the results now. (2003, Armidale Diocese)

Two responses indicating some *negative attitude* (*QuickSmart* Numeracy or *QuickSmart* in general):

Unfortunately the program can reinforce negative stereotypes of the students involved and mathematics in general. (2006, Area NT)

Attitude was mixed. Several students exhibited defiant behaviours when asked to attend. (2007, Western Region)

There were three positive comments about the *attitudes of non-participating students* (*QuickSmart* Literacy program):

*QuickSmart* is a positive program. The children on it are always happy to go. The other class members are very accepting of the program. (2006, Lismore Diocese)

Students are positive in general. (2007, North Coast Region)

No obvious perceptions of other students – if anything, jealousy. (2006, Lismore Diocese)

Overall, the responses from teachers were very positive. The majority stressed the positive impact of the program on students – the fact that it was effective in improving students' academic performance and their confidence and self-esteem. They also commented positively on the structure of *QuickSmart* lessons and on the attitudes of non-participating students. With respect to the negative or challenging aspects of the program (Question 4), these had mostly to do with time constraints, fitting in with the school routines, logistics, and funding.

## **Summary of Qualitative Data from NT Professional Development Workshops (2006 – 2008)**

Participants in the professional development workshops held in the Northern Territory are encouraged to provide feedback on how useful the workshops have been. Feedback is sought on specific aspects of the workshop content and delivery by questionnaires that allow respondents to rate the extent to which the workshop addresses various specific outcomes. Workshop participants are also requested to share their views of how useful the professional development sessions are by providing more detailed written responses to stimulus questions.

Feedback about the usefulness of the professional development workshops to *QuickSmart* instructors and coordinators is overwhelmingly positive. The following table summarises data collected from workshop participants in 2006, 2007 and 2008 for selected workshop outcomes.

**Table G.5: Qualitative Data from Workshop Participants (2006-2008)**

Workshop Outcome Descriptor	Total number of respondents	Number of responses indicating that outcomes were met to a 'High' level 3	Number of responses indicating that outcomes were met to a 'Satisfactory' level 2	Number of responses indicating that outcomes were 'Not Achieved' 1	No response provided
Overall, degree to which the stated outcomes were met	112	70	30	0	12
Introduction to <i>QS</i>	67	44	12	0	11
The <i>QS</i> Lesson Structure	74	33	16	1	24
Review/Revisit of the <i>QS</i> Theoretical Framework	69	38	21	2	8
Planning a <i>QS</i> Lesson	43	22	12	0	9
Progress or Evaluation Reports from Schools	69	50	9	1	9
The CAAS Program	43	27	10	0	6

As the Likert scale ratings of the selected workshop outcomes show, over 80% of the responses were positive and confirmed the value of the professional development workshops. The written feedback from workshop participants similarly indicates that the professional development workshops are both useful and inspirational, as the selection of comments below demonstrates.

I feel that I have learnt a lot from other schools from school evaluations. Great to see results from the year. (NT *QuickSmart* workshop participant, November 2008)

I have found this workshop of great value as I have been able to share and listen to everyone's experience with *QS* for the first time. (NT *QuickSmart* workshop participant, July 2008)

These workshops always are reinvigorating. Can't wait to try out new things! Learn more! (NT *QuickSmart* workshop participant, July 2008)

Very useful to finally hear the theories behind *QS*. This helps it all come together and make sense. (NT *QuickSmart* workshop participant, July 2008)

Cleared up a few areas where I can make improvements. (NT *QuickSmart* workshop participant, July 2008)

The share back time was great because it allowed us to share concerns, stories, positives and queries. (NT *QuickSmart* workshop participant, March 2008)

It was good to know that flexibility is an option depending on the needs of the student. Also that the program isn't too rigid in its application. (NT *QuickSmart* workshop participant, March 2008)

Thank you. I feel confident. (NT *QuickSmart* workshop participant, March 2008)

New ideas and reconnect with research and theory of the program. (NT *QuickSmart* workshop participant, August 2008)

Seeing lots of other people sharing ideas. Learning about using resources in a better way. (NT *QuickSmart* workshop participant, August 2008)

Trying to implement this program without a hands on workshop would be too scary. (NT Extended Pilot Project *QuickSmart* workshop participant, 2006)

Able to ask questions and get ideas from others. Finding out the results from previous studies. (NT Extended Pilot Project *QuickSmart* workshop participant, 2006)

Refreshing memory, juiced up for imminent start and meeting other participants and sharing strategies. (NT Extended Pilot Project *QuickSmart* workshop participant, 2006)

## SECTION H: SUSTAINABILITY OF THE QUICKSMART PROJECT

The sustainability of any educational innovation is complex and presents challenges, especially as the innovation ‘scales up’ as a result of growing demand. This section of the Report outlines the various ways in which the *QuickSmart* project has addressed sustainability issues to date. It then provides an overview, based on a literature review, of the potential challenges that lie ahead.

*QuickSmart* is a program offered under the auspices of the SiMERR National Centre at the University of New England. SiMERR is a not-for profit organisation that uses any accumulated funds to involve more schools and students or to provide increased support to participating *QuickSmart* schools.

*QuickSmart* uses an iterative process of trial and error, consonant with research and development efforts in other fields. This process has occurred throughout the development of the intervention itself, the evolution of the means to scale the intervention, and actual experiences to date of scaling up the implementation of *QuickSmart*. The trial and error nature of achievements is both natural and unavoidable given that there is little codified wisdom for designers and developers to guide such activities (Glennan et al., 2004). The following examination of the nature of educational sustainability shows how efforts to establish *QuickSmart* are consistent with current thought around this issue.

### Characteristics of Educational Sustainability

According to Professor Andrew Hargreaves, as he is quoted in the 2005 report of the Australian Curriculum Studies Association, sustainability does not simply mean whether something can last. Sustainability refers to how particular initiatives can be developed without compromising the development of other good ideas in the surrounding environment, now and in the future. Thus sustainability, particularly in terms of leadership, has seven important characteristics that should be considered with regard to the implementation of educational reforms such as *QuickSmart*. These (Hargreaves, 2005, p.25) are:

Depth – ‘It matters’

Endurance – ‘It lasts’

Breadth – ‘It spreads’

Justice – ‘It does no harm to the surrounding environment’

Resourcefulness – ‘It conserves expenditure and does not burn people out’

Diversity – ‘It promotes diversity and cohesion; avoids standardisation’

Conservation – ‘It honours the past in creating the future’

It is these characteristics of sustainability, and the way in which *QuickSmart* addresses them, that are discussed below.

## Depth

*What is being implemented matters in terms of the big issues of education.*

The *QuickSmart* project has, over the years (2001-2008), demonstrated that it effectively addresses one of the biggest issues in education: how to close the gap between low-achieving and average-achieving students in the areas of numeracy and literacy. Several national and international reports indicate that up to 30% of the student population by Year 7 do not meet current numeracy and literacy benchmarks. This is especially the case for those living in rural and remote areas, those from low socio-economic backgrounds, and Indigenous and NESB students. Students who fail to meet these Benchmarks by Year 7 are destined to have reduced life-chances in work, education and health compared to the majority of the population.

Clearly, there is strong national commitment and resourcing currently being directed to improving the numeracy and literacy needs of students, particularly those students who reside in low socio-economic status (SES) locations. Unfortunately, it is unclear that the potential for this reform will be realised. Obviously changes will occur, but the important issues are whether these reforms will make a difference to the entrenched failure rate of the bottom 30% of students in Years 3 to 7, and whether these students will continue to benefit (and grow) as a result of their educational experiences two, three or five years after the support has finished.

The *QuickSmart* project's purpose is to address this issue and provide an environment that will enable students to overcome their educational disadvantage. This means that it is an expectation that every student within the program can meet or extend beyond National Benchmark levels in future tests. *QuickSmart* has not only accumulated a large data base testifying to the significant effect it has on student achievements by the end of the program, but also evidence as to the benefits and improved learning outcomes that continue years after the students have completed the intervention program.

Schools also report many indirect outcomes related to the *QuickSmart* program. For example, it has been reported that as a consequence of *QuickSmart*, students improve their behaviour in and out of the classroom, their level of attendance, and learning outcomes as measured by standardised or state-wide tests. In addition, many students who have completed the *QuickSmart* program are less likely to require or be assigned to receive further educational support or special education programs. Hence, the compelling evidence from *QuickSmart* is that what is being addressed, implemented and achieved as a result of this program matters in terms of the big issues of education.

## Endurance

*The effects of the implemented program last. There is a need for a long-term educational view because what lasts tends to be not the particular program itself but the principles and people behind the program.*

Data that have been collected over time indicate that the positive educational effects of the *QuickSmart* intervention programs last up to five years after students have exited the program. There is also research evidence to suggest that there are general positive effects on students' levels of self-confidence as learners, as well as on their ability to act more independently as learners. Another enduring effect of the



*QuickSmart* program is the reportedly increased skill base amongst *QuickSmart* Coordinators and Instructors (teachers and teacher aides) that results from both the professional learning opportunities provided by the *QuickSmart* program and from what these professional and para-professional teachers experience in practice during the implementation of the *QuickSmart* program.

Similarly, principals have commented how the program has had an influence on whole-school improvement. They acknowledge that while *QuickSmart* is not a whole-school program its effects can be felt school-wide. It can take time for schools to come to appreciate the gains being achieved because of *QuickSmart* as the development of new roles for key personnel, such as principals, teachers, and *QuickSmart* Coordinators and Instructors, are implicit in the implementation of the program. Therefore, while there is very strong evidence of growth in *QuickSmart* students in the first year of implementation of *QuickSmart* (about 10% on average), evidence exists that this increase can be expected to improve (even double) in the second and subsequent years.

In addition to these indicators of endurance of the intervention, it is the case that for many schools, the efforts extended in narrowing the gap between low-achieving students and their average-achieving peers over time are having a measurable whole-school effect. Narrowing the gap by improving the basic skills of low-achieving students serves to reduce the range of abilities in a classroom and can make it possible for teachers to move the performance of all members of their class to a higher level.

## Breadth

*The program spreads because it meets a recognised need. Sustainable programs develop learning communities for students and teachers and other school personnel.*

Analyses of quantitative data collected since 2001 on the implementation of *QuickSmart* indicate that some students participating in the intervention programs make academic gains that enable them to catch up with their average-achieving peers. As one mother reported “For kids who are having a bit of trouble with the basics, the program has given them the boost they need to catch up, keep up and stay confident with themselves.” One critical consequence of this growth is that, sometimes for the first time in years, these students can benefit academically from normal classroom instruction.

Another indicator of the successes of the *QuickSmart* intervention is that ‘new’ schools become aware of the program as a result of word-of-mouth reports from staff in ‘experienced’ schools that are using *QuickSmart*. It is common knowledge that the greatest advocates for ‘selling’ *QuickSmart* nationally and internationally are those people who have first-hand experience with the program.

## Justice

*The program is compatible with other programs in the school or offered by the system. The program works in a collaborative way with the school community, especially parents and works to bring them closer to the school.*

There is a close collaboration between SiMERR National Centre *QuickSmart* staff and staff members involved in implementing the *QuickSmart* program in schools.



Every effort is made to support individual schools in the smooth implementation of *QuickSmart*. Contact with parents is strongly encouraged, and all stakeholders (students, *QS* Leaders, Instructors and Coordinators, and classroom teachers, principals, parents/carers, and special needs coordinators) are encouraged, through questionnaires, to voice their opinions on the implementation of the program and its effects.

The ideas underpinning *QuickSmart* are built on instructional components and organisational concepts for which there is strong research support. The teaching techniques and strategies used in *QuickSmart* are readily drawn from what are defined as quality teaching practices (Hattie, 2009). For example, the instructional approach used: focuses on commencing instruction where the students are currently performing; recognises the importance of deliberate practice, involves students in meaningful high on-task time activities and lessons; expects explicit teaching when necessary, providing feedback to students through formative monitoring of their growth; sets achievable targets that are understood by the students; encourages students to understand their own thinking processes; and shares with students the excitement associated with the many obvious successes that they achieve.

The consistent results of the *QuickSmart* research indicate that for genuine improvement to the academic performance of low-achieving students to occur, teachers must learn to apply different and more effective teaching methods, as well as to coordinate varied models of student support than is currently their practice. Hence, underpinning the *QuickSmart* program is the importance of having both a coherent set of practices for teaching, learning, and assessment, and the associated infrastructure to support the learning needs of low-achieving students in the classroom. Without this coherence, changes in classroom practice will not survive.

*QuickSmart* attempts to change teacher practices in a deep way and to sustain these changes across many sites over time. The challenge to scaling up the intervention lies not only in getting teachers to change their practices but also in creating the environment and institutional supports needed for such changes in practice to endure. Associated with, and driving, this change is the need for high-quality ongoing professional learning experiences for all participants, including school executives, teachers, teacher aides and regional personnel.

## Resourcefulness

*The program conserves expenditures and does not burn people out. It is necessary to consider how all involved can experience renewal (physical, emotional, intellectual, spiritual) and therefore maintain energy and enthusiasm.*

In developing *QuickSmart*, we have endeavoured to pay thorough and ongoing attention to the need for support that school personnel have in relation to the implementation of new practices. As a result, the *QuickSmart* intervention programs are well resourced with learning/teaching materials, lesson plans and an overall structure that supports both learners and instructors. Apart from the ongoing support provided by *QuickSmart* staff located at the SiMERR National Centre, *QuickSmart* instructors are also provided with opportunities to share their experiences in professional learning workshops.

At these workshops, participants not only learn more detailed strategies and approaches to helping low-achieving students, they also have opportunities to share stories of their successes. In addition, they are encouraged to speak to the challenges they may have faced and to support other people with ideas and practical insights drawn from their experiences. The professional learning workshops facilitate the development of learning communities that act to help those involved in the implementation of *QuickSmart* maintain their energy and enthusiasm.

Another significant feature of the implementation of *QuickSmart* is that by forming a network, the school personnel who work together share a common vision and a common language. They are also in a position to create emotional connections and support systems. Over time, such a focus creates an *esprit de corps* – an understanding and acceptance of the struggle needed to achieve the success expected of each student in the program.

## Diversity

*The implementation of the program promotes diversity and advocates ways of meeting students' learning needs. It avoids standardisation.*

While the *QuickSmart* program is highly structured, in the course of its actual implementation it is designed to cater directly to individual learners' needs. Pre-tests identify students' current performance levels and indicate where individual learners should begin their program of study. Thereafter, each student's learning experiences are informed by continual formative assessment based on the student's basic mathematical knowledge as demonstrated by their responses to flash cards, speed-sheets and CAAS tasks. *QuickSmart* is, therefore, designed to address the diversity of individual learners' needs.

While there is the opportunity for school personnel to tailor the *QuickSmart* program to the particular needs and structures required by their students, there are definite aspects of the program that are common across all interventions. For example, each school has a *QuickSmart* Leader (drawn from the executive of the school, i.e., Principal, Deputy or Assistant Principal), a *QuickSmart* Coordinator (an experienced and respected teacher within the school) and *QuickSmart* Instructors (teachers or para-professional teacher aides). These people have particular roles, professional learning demands and concomitant expectations. The lesson structure with its six components and their associated tight time limits is also a common structure across all implementations of the intervention, as is the associated resourcing plan and strategy implementation procedures associated with the *QuickSmart* intervention.

The general prescriptiveness of *QuickSmart* and the training and follow-up mechanisms that support it, are sometimes perceived to be problematic before the program begins. However, these features rarely prove to be a long-term concern. Over time, as members of the school *QuickSmart* team, other teaching staff, and parents recognise the improved learning outcomes of the participating students and come to understand the methods employed, the flexibility within the *QuickSmart* program becomes more apparent. This is evident from reports made by school teams that have been in the program for a few years.

Nevertheless, despite minimal variations to the *QuickSmart* program that maintain its flexibility in order to suit different educational contexts, it is clear that the integrity of

the program needs to be maintained. If the results described in this Report are to be maintained in experienced schools and established in new schools, then fidelity to the central tenets of *QuickSmart* must be evident. The rationale for this assertion is that the core features of the *QuickSmart* intervention have been carefully researched, and are considered those most likely to offer students observable improvements in a relatively short period.

Overall, the responses by those involved in the *QuickSmart* program have been overwhelmingly positive. The availability of extensive *QuickSmart* materials and a quality professional learning program spread manageably over the year has resulted in well prepared *QuickSmart* team members commencing the program in schools. Workshop evaluations consistently report that the *QuickSmart* professional learning program has resulted in participants feeling confident, challenged and excited by the prospect of implementing the program in their schools.

## Conservation

*The implementation of the program honours the past in creating the future. The program builds selectively on the best of what has gone before.*

Since its initial development in 2001, the *QuickSmart* program has evolved and been refined. The developers and their team have consciously conserved what worked in the past, yet added modifications that arose as a result of observations and feedback received during the implementation of the program. *QuickSmart* is, thus, an excellent example of a program that conserves and builds selectively on the best of what has gone before.

There are four principles that have underpinned the scaling up of the *QuickSmart* intervention to date. These four principles (Glennan, et al. 2004, p.650) are termed interactive, adaptive, iterative, and non-linear. In relation to each of these descriptors the *QuickSmart* program builds on the past by addressing emerging issues in an *adaptive* way. The views of participants at relevant levels of different jurisdictions (schools, regions or State/Territory) are considered in order to address issues and consolidate improvements in student learning.

In particular, the development of the *QuickSmart* intervention has been purposively *interactive*, through establishing close working relationships with teachers, schools, and district personnel and encouraging their comments and advice. Very few participating schools have discontinued working with the SiMERR National Centre. In cases where dislocation has occurred it has often been because of lack of funding support. Interestingly, schools that have ceased to offer *QuickSmart* often return after one or two years' absence.

While the basic components of the *QuickSmart* intervention program have changed only slightly, these modifications have come about through an *adaptive* approach. This involves valuing the views of those schools involved in the program while at the same time holding securely to those elements that are central to the success of *QuickSmart*. The *QuickSmart* team has endeavoured to establish reciprocal relationships with participants and seriously considers their reactions to unfolding situations.

As this Report illustrates, the development of *QuickSmart* has been *iterative*. This research program commenced in one primary and one secondary school in 2001, yet in 2008 was implemented in over 90 schools. Throughout its development there has

been, and continues to be, an ongoing reexamination of all aspects of the *QuickSmart* operation which has benefited the intervention over time.

Finally, as the above discussion suggests, the development process of *QuickSmart* has neither been straight-forward nor inflexibly driven but, instead, it can be described as *nonlinear* and responsive. This means that the refinements and gradual expansion of *QuickSmart* have been guided by the needs of the different personnel involved and reflects the capacity of the SiMERR team members to respond to new and unfolding circumstances.

## Future Sustainability Issues and Challenges

Some of the literature dealing with sustainability issues faced by educational innovations signal several possible challenges that the *QuickSmart* project may face as it ‘scales up’ to meet demand. As indicated in Section A of this report, demand for the *QuickSmart* numeracy and literacy programs has grown (and continues to grow) phenomenally as a result of the programs’ proven track record of narrowing the gap between low- and average-achieving students.

However, as demand for the programs grows, so too do several challenges, including the need to construct a sustainable supportive infrastructure, the need to develop supportive distributive leadership structures, and the need for both short-term and long-term commitments to the *QuickSmart* project from funding bodies. On a school basis, not everyone achieves the success we seek to attain. Not surprisingly, the key factor in the success or failure of *QuickSmart* at the school level is the quality and completeness of the implementation. Resourcing and funding support are of particular concern as without these it will be impossible to secure the requisite infrastructure and long-term commitment to ensure the *QuickSmart* project’s sustainability.

## Supportive Infrastructure

The literature emphasises that the continued and sustainable success of educational innovations depends to a large extent on a focused, strong and supportive infrastructure at all levels of the education system. Earl, Levin, Leithwood, Fullan, and Watson (2001, pp. 99-98), for example, found that the main reason for change not being sustained “...is that the infrastructure is weak, unhelpful or working at cross-purposes.” Furthermore, “In 1984, Huberman and Miles found that, when the local district mobilised to ensure that the reform became a key element in routine operations with the budget and personnel to keep it vibrant, the likelihood of changes being embedded in the local structure increased” (Earl et al., 2001, pp.98-99). This view is reiterated by Sackney (2006, p.11) when he states that, “flow of schooling is disrupted when there is lack of alignment and coherence. Teachers and school administrators receive mixed messages when no one direction is pursued consistently over time. Instead of flow, there is perpetual turbulence, and this tendency of systems to create turbulence confounds attempts to institutionalise systematic reform.”

Along similar lines, Hargreaves (2007, p.3) noted that, “the early promise of pilot projects rarely spreads to the rest of the system which is funded to nowhere near the same degree. Waves of government initiatives and reforms wash over world-weary schools who simply wait for the tides of change to recede.” Successful dissemination of a program as comprehensive and complex as *QuickSmart* requires a combination of

two types of assistance to schools. One is a core of competent and dedicated trainers. The second is a local and/or state network of schools willing and able to provide technical and emotional support to new schools entering the network.

Quality control is a constant concern. Whatever dissemination strategy is used there is the need to constantly check on the quality of training, implementation, and outcomes of the program. Without it, the program will not succeed and what is referred to as *QuickSmart* will be eroded as will be the size of the student learning gains.

If more struggling learners are to benefit from the *QuickSmart* Numeracy and Literacy programs, it is thus imperative that sufficient long-term support is secured in the form of funding that will facilitate the creation of a robust infrastructure and Quality Assurance mechanisms to ensure the sustainability and fidelity of the *QuickSmart* project.

## **Distributed Leadership**

Related to the creation of a focused, supportive infrastructure is the need to distribute leadership so that when educational leaders leave a school, educational innovations such as the *QuickSmart* Numeracy and Literacy programs survive. As Hargreaves (2007, p.3) points out, “beacons of innovation usually fade once their founding leaders move on and focus shifts elsewhere.... And charismatic leaders who heroically turn their schools around, typically don’t stay long enough to ensure that they stay turned around beyond one or two years.”

Hargreaves & Fink, (2003, pp.6-7) propose that leaders can leave a lasting legacy by ensuring that “...it is developed with and shared by others. Leadership succession therefore means more than grooming principals’ successors. It means distributing leadership throughout the school’s professional community – so it can carry the torch once the principal has gone, and softens the blow of principal succession (Spillane, Halverson, & Drummond, 2001).

To sustain innovations over a long period, *QuickSmart* seeks to have the implementing schools be part of a cluster (or network) of like-minded schools that are geographically close. In order to survive the inevitable changes of senior region personnel, principals, teachers, and various jurisdiction policies, and school staffs need to feel that they are not alone in carrying forward the innovation. There is a vulnerability about schools using *QuickSmart* and, indeed, any program that is at the innovative edge. There are no simple answers to overcoming this issue, but it helps if there are senior personnel within the Region or State who care about and support what the schools are doing and are able to openly and genuinely acknowledge the gains and achievements not only of the students, but of the school.

School and regional results for *QuickSmart* in the Northern Territory and parts of New South Wales have shown the possibility of achieving outstanding outcomes on a substantial scale if education leaders align their policies and professional development efforts around *QuickSmart*’s requirements. However, even such support that may result in large-scale implementations in regions exposes the program to greater political risks.

The *QuickSmart* project attempts to develop structures that support distributive leadership by conducting information sessions to educational leaders (as described in



Section A of this report) as well as professional development workshops for *QuickSmart* school Leaders, Coordinators and Instructors. It encourages schools to involve other teachers in their schools into a collaborative endeavour as well as work with parents so that they understand and can actively participate in what is happening to their children.

## Short-term and Long-term Commitments

Another potential challenge faced by educational innovations such as the *QuickSmart* project arises, paradoxically, as a result of the success of the intervention programs. While funding is available to schools considered 'at risk', this funding is frequently withdrawn once results for a cohort of students indicate that the educational innovation is showing success. This, however, has serious ramifications for other cohorts of learners within the school who are experiencing difficulties, as they no longer have access to the support provided by those programs. As Hargreaves (2007, p.9) reminds us, "the students in front of you – especially those who are most at risk – cannot be sacrificed to improvements that will only bear fruit far into the future. Tomorrow is too late for them." It is therefore essential that effective educational innovations continue to be funded so that new generations of students can also benefit from them. As Sackney (2006, p.3) and others point out, "there is no quick fix".

Citing Fullan, Sackney (2006, p.4) concludes that "...there has to be a dual commitment to short-term and long-term results" and that "governments have to show progress in the short-term, but bearing in mind that capacity is developed for the long-term." Hargreaves (2002, p.191) states the case clearly:

...sustainable improvement is enduring, not evanescent. It does not put its investment dollars in the high profile launch of an initiative, then withdraw them when the glamour has gone. Sustainable improvement demands committed relationships, not fleeting infatuations. It is change for keeps, and change for good.

## QuickSmart Models for Supporting Schools

Over the course of its implementation, the *QuickSmart* project has developed several models and structures for the creation of state, regional and school organising committees to ensure the sustainability of the project. In 2007 and 2008 in the NSW North Coast region, for example, *QuickSmart* negotiated the release by the DET of an experienced special needs practitioner for two days a week to coordinate the implementation of the *QuickSmart* numeracy program in 16 schools. A similar situation occurred for the New England Region of NSW.

In the Northern Territory there has been substantial support provided by the Numeracy Team within the Teaching, Learning and Standards Division of the NT DET since 2005. In 2009, this support has grown to involve a new substantive position of Project Manager Interventions (*QuickSmart*) who coordinates the roles of the Numeracy and Literacy teams in respect to *QuickSmart* as well as provides the link with all schools that have adopted the intervention. Samples of these models are included in Appendix 36.

As can be seen from the models in Appendix 36, *QuickSmart* team members based at the SiMERR National Centre are responsible for providing direction and ongoing

support to schools that implement the intervention programs. Brief descriptions of the tasks and responsibilities of individual *QuickSmart* team members are provided at the end of this Report.

Finally, as a conclusion to this Section two letters are provided by senior Education Department Personnel from the Northern Territory and New South Wales (please refer to the letters of commendation in Appendix 37).

In the feedback concerning *QuickSmart* from Ms Debbie Efthymiades, General Manager, Strategic Executive Services, Northern Territory Department of Education and Training, she stated:

I write this letter in support of the extensive, selfless and outstanding support provided by the *QuickSmart* team in the SiMERR National Centre at the University of New England since the Northern Territory commenced a small scale pilot of the numeracy program in eight schools in 2005.

The partnership between the *QuickSmart* team and the NT Department of Education and Training (DET) was initiated due to a clear decline in the numeracy achievement of NT student cohorts from Year 3 to Year 5 and a further decline from Year 5 to Year 7 within the annual systemic numeracy assessment program.

From the inception of the program and the partnership with the *QuickSmart* team, it was evident that the research behind the program was grounded in both powerful cognitive development theory and robust, practical child and school-centred application of this theory. This was immediately substantiated by the outstanding 'effect size' results and overwhelmingly positive feedback from students, paraprofessionals, teachers, parents and school leaders associated with the initial pilot.

Although the extraordinary improvements in student achievement and the qualitative feedback were incredibly compelling, the NT system was in the process of learning some hard lessons about scaling up pilot programs from the partnership with the Australian Government in the *Accelerated Literacy* program. As a result, instead of making the program instantly available to any interested school, a limited number of schools with poor numeracy results were identified in the subsequent three years so that implementation would grow in a managed way. By 2008 the school grapevine had overtaken this managed approach and this year there are 61 schools (out of a total of 150 DET schools) using the *QuickSmart* numeracy program and 12 using the literacy program – the latter having been introduced as a very small pilot in 2007.

The *QuickSmart* team has provided an outstanding collaborative approach to the ongoing program implementation and associated research. The component that has been most valued by the NT could best be described as providing an 'adaptive management' approach to program implementation. In the case of *QuickSmart*, this has involved running a robust action research theme in parallel to the program's



expanding implementation. On the basis of this ongoing research, the *QuickSmart* team, in partnership with DET has continued to refine both the program and its implementation in the ensuing years to increasingly cater for educators and students in the Northern Territory's extremely complex very remote school contexts, which are among the most disadvantaged in Australia.

Three particularly pleasing amendments to the program have been:

- sustaining the same rate of improvement when conducting the program for a 2<sup>nd</sup> year with students who commenced from a very low initial base level of numeracy achievement
- use of *QuickSmart* to improve the numeracy levels of many of the Indigenous Assistant Teachers in very remote schools. These paraprofessionals are then able, in turn, to work as tutors with students in the *QuickSmart* program.
- refining the delivery model to have a regional focus including 'hub' schools where quality program implementation can be demonstrated and observed as part of the professional learning for incoming schools.

Improvements in student achievement results through the *QuickSmart* program have continued to be outstanding throughout the five-year expansion including the clear improvement in Year 5 and Year 7 numeracy results in the inaugural 2008 National Assessment Program Literacy and Numeracy (NAPLAN) tests. Of particular note, the numeracy results for the NT exceeded literacy results at these year levels for the first time in history. The connections to the *QuickSmart* program are both valid and strong as a major contributing factor for these improved results.

The improvements noted above have been realised despite increasing numbers of students with even lower levels of numeracy entering the program and continuing to improve at the same rate as previous cohorts.

As NT schools continue to focus on data-informed school improvement planning and increased resources become available through National Partnerships and associated funding, it is anticipated that *QuickSmart* will continue to expand in the Northern Territory and DET looks forward to continuing the positive and productive collaborative partnership that has been built over the past five years.

In his letter, Mr Des Gorman Acting General Manager, Learning and Development, New South Wales Department of Education and Training commends the *QuickSmart* intervention model adopted in New South Wales.

Re: *QuickSmart*

*QuickSmart* Numeracy is an intervention program used in the New England region of NSW Department of Education and training. Fifteen schools have opted into this intervention, which is aimed at Years 5-9.

The program is highly regarded by the schools participating in this intervention. Its focus on automaticity and its capacity to lift the self worth of learners who have struggled over time to fully understand mathematical concepts and achieve success with problem solving are the strengths of the program.

The program in schools is very closely supported by the team from the University of New England. This support is offered in the form of training, software applications, support materials and on-going advice and clarification.

My experiences in viewing *QuickSmart* in action in the schools in New England are all positive. I have found many students, who were previously disengaged with mathematical activities, totally engaged in the activities and process that form a major part of the intervention.

I have also spoken to teachers and learning support officers who have played a coordinating and tutoring role in the participating schools. They have indicated a renewed interest in the participating students in improving their mathematical abilities incrementally and a renewed sense of confidence in their ability. Principals of schools share these views.

Independent research in the New England region indicated that students, including Aboriginal students, make quick gains in their ability and confidence to use mathematics.

*QuickSmart* Numeracy is being strongly considered as an option for NSW schools from all three sectors involved in the National Partnership, Literacy and Numeracy.

## SECTION I: CONCLUSIONS

The learning difficulties experienced by many middle-school students are persistent and resistant to change without sustained and intensely focused personalised instruction. Consequently, the SiMERR National Centre has developed a carefully constructed educational intervention (referred to as *QuickSmart*) that supports those students who experience continuing difficulties with basic academic skills.

The development of the *QuickSmart* intervention has drawn upon extensive analyses of the research literature (e.g., Swanson & Hoskyn, 1998) while its implementation has been supported by research grants from the Australian Research Council, project funds from the SiMERR National Centre, and extensive cash and in-kind support from the Northern Territory and New South Wales Departments of Education.

The following principles have guided both the development and scaling up of the *QuickSmart* intervention:

- Research evidence should inform policy positions and systemic approaches to addressing the needs of low-achieving middle-school students (see Appendices 1 – 3, and 9).
- Programs designed to address the learning needs of low-achieving middle-school students should be intense, of significant enough duration to make a difference, and conducted in small class instructional settings.
- An extensive professional learning program for teachers, teacher aides and executive members should be an important component of any sustainable instructional intervention.
- Improving the skill base of teacher aides should be a focus of attention for all support programs, especially those in rural and remote areas where teaching staff mobility is a significant factor.
- To ensure sustainability, National, State, regional and school level stakeholders need to coordinate their efforts and collaborate to ensure the fidelity of the program, and the viability of its implementation and scaling up processes.
- Costs of the program should be shared across National, State, regional and school-level stakeholders.

*QuickSmart* is a comprehensive intervention package designed primarily for students in the bottom 30% of the achievement spectrum in Years 5 to 8 (11 to 13 year olds) who have been performing poorly in numeracy or literacy as evidenced by the results on standardised, state-wide, national tests. It offers these students a possible last chance to succeed in education by teaching for success. The *QuickSmart* approach emphasises both understanding and automaticity.

Students who complete the *QuickSmart* program show general, sustained improvements in independent learning, self-regulation, metacognition and self-esteem. *QuickSmart* is an intervention program that targets, with small class instruction, those students in the lower 30% of the achievement spectrum. While

*QuickSmart* was not designed to be a school-wide program, its effects can be school-wide, with whole school improvement a common outcome for schools that have implemented the program for a sustained period.

*QuickSmart* is based around clusters of 10-15 schools, which comprise a learning community. Schools within these communities are offered extensive professional learning experiences that engage and encourage executive teachers, experienced teachers and teacher aides to better address the learning needs of low-achieving middle-school students. These schools are encouraged to share ideas, experiences and support. It appears that isolated schools on the frontier of innovation can implement the program for a couple of years whereas systemic and lasting change is more likely to occur when schools work together and are supported as part of a network.

The *QuickSmart* intervention draws on a knowledge base of general research from the intervention literature and on high-quality scientific research carried out in all jurisdictions where the *QuickSmart* program has been conducted since 2001. The purpose of collecting such a large data set is to provide compelling evidence that will help senior executives in schools, clusters, regions, states/territories, and federal jurisdictions to make informed decisions concerning the adoption and implementation of *QuickSmart*. Significantly, the strong evidential basis for *QuickSmart* aligns to and utilises the same standards and/or tests as those used by the Federal Government and agreed to by all States and Territories.

Hence, *QuickSmart* stands as one of a very few interventions which have examined implementation at all sites over a significant period. Thus, the *QuickSmart* program can demonstrate its successes at scale-up to public scrutiny. Only by collecting and analysing the data needed to address potential concerns can adopters have access to the information they need, namely, that *QuickSmart* has a high probability of producing beneficial outcomes during the scale-up phase of implementation.

## **Last Words**

In conclusion, in this Report we have provided extensive quantitative and qualitative sets of evidence for over 2,000 students and many hundreds of teachers and parents. Both sets of results point to how *QuickSmart* helped “narrow the gap” for low-achieving middle-school students. Analysis has identified impressive statistically significant gains in terms of probability measures and Effect Sizes that mirror the qualitative improvements reported by teachers, *QuickSmart* Instructors and parents.

On this note, it is important to reconsider the parents’ perceptions of the program in order to “bring to life” the results already presented. Parents were interviewed about how they felt their children reacted to the *QuickSmart* program. In all cases their views were positive.

Again, we ask the reader to look beyond the overt positiveness of the comments to the underlying behavioural indications of success and hope that these parents observe in their children that was not evidenced in the years before these students completed the *QuickSmart* program. Examples of four parents’ comments are included below:

*Remarkable! From a little girl who verbalised she was ‘dumb’ and completed homework for Maths amidst tears to a confident, have-a-go child who now knows she is a good and able and successful learner!*

*No external gratification/rewards can convince children they can do it. The QuickSmart program has delivered skills and accuracy, underpinned by a 'have-a-go' and 'trust your head' philosophy. ALL K.L.A's at school 'shine' now as my child is now a 'QuickSmart Girl'.*

Two parents (one with two children in QuickSmart and the other whose children attend an Indigenous school) responded in depth to the end of program survey. Their comments follow.

*My children have reached their goals and set new goals. They have a positive morale in their attitude to learning thanks to QuickSmart. Since my children have been involved with the program it has given them positive directions. The program has enhanced their desire to keep learning maths in everyday situations. My children always praised the program. They love solving any challenging problem that is put in front of them. The QuickSmart program is "excellent". I've noticed the attitudes towards learning and challenging things. It has had an impact on my children's learning of education and how they can be independent in solving situations in Maths and English. To sum it all up – Thank you for involving Our Primary School in this program. It has been a great asset to our children's education and the instructor has done an "excellent" job in delivering this program to our children.*

*The QuickSmart program for my child has and is the only solution for my daughter's development. I also see positive outcomes from other students that participate in this program. This program MUST be part of our school's future and their development of the corporation. I am pleased to assist in any way to reply and assist my child in the program especially at home. I have seen my daughter change in her performance over the past year as a participating student of QuickSmart. My daughter has a new quick approach in thinking to anything. If her answer is not correct she will question it. She has an open mind and will question another point of view. With this approach, my daughter is like a runaway train. She enjoys all tasks that have to be done from school in general and in QuickSmart. I must continue this support at home. My daughter is always thinking and using her knowledge about what QuickSmart is presenting to her. Her solution is that she never stops talking and questions everything at home, down the street, in the shops, shopping centre, even travelling. Information about the program has come to me from others e.g., teachers, admin staff, the children (past and present), the instructor, community members. All views are very positive. Any new development for Minimbah must be an asset to the organisation. Our school must build on this program to keep its integrity. The children enjoy it and the development in school behaviour comes from QuickSmart. At home we have a library day on every Saturday at the town library. I set aside time for homework in which the first things my girls do when they get home. Please continue the development at our school for the children. As a concerned parent, our children need*

*their own pathway through school and after. It's a pleasure in any way to assist and participate as a parent!*

Finally, we include a letter sent to the teachers at a school where a boy was undertaking QuickSmart Literacy.

*So I don't know if this is still useful, but I do feel passionately about the usefulness of the program and I hope you can continue it for the benefit of other kids like mine.*

*If I were to try and pick 'the one best thing' for John this year, it would be the QuickSmart Literacy program. He comes from a family of readers, I work in the book industry and am constantly putting books in front of him, I've always tried to make time to read with the younger kids and I've been delighted to watch the older ones reach the point of being independent readers who discover the magic of books and continue on the reading journey by themselves. John however, hadn't got to that breakthrough point, and as his interest level has matured, he has become increasingly frustrated by a reading level that hasn't kept pace and so he's tended to avoid reading – it's either hard work, or pointless. At the same time, he's also managed to get by at school. His literacy wasn't so poor as to obviously attract intervention, so I was delighted when the teacher nominated him for this program.*

*What it has done is give him skills to read more fluently, and the confidence to know he can. The more he knows he can, the more he tries. The more he tries, the better he gets. It sounds simple enough, but it wasn't happening before QuickSmart. Even more amazing is, he enjoyed it (and this from a boy whose favourite thing about school is home time). Now he can read books at a level that interests him, not just 'easy' books. Sometimes, he even reads voluntarily, in the day time!!*

*So I can't thank you enough for helping him achieve that breakthrough. As he goes on to middle school particularly, I can see how limited literacy can severely compromise kids' ability to achieve, and how the quiet 'non-achievers' can fall through the cracks and I'm delighted that he's now in a much better position to engage with the whole schooling experience beyond the playing of soccer!*

*Thank you so much,*



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## LIST OF ACRONYMS USED IN REPORT

ACER	Australian Council for Educational Research
ANOVA	Analysis of Variance
ARC	Australian Research Council
CAAS	Cognitive Aptitude Assessment System
DEEWR	Department of Education, Employment and Workplace Relations
DET	Department of Education and Training
DV	Dependent Variable
ES	Effect Size
ESL	English as a Second Language
ID	Independent Variable
IM	Mild Intellectual Disability
KSA	An NT School of the Air (Northern Territory)
LATAS	Laboratory for the Assessment and Training of Academic Skills
LBOTE	Language background other than English
MANOVA	Multivariate Analysis of Variance
MAP	Multilevel Assessment Program
NAPLAN	National Assessment Programme - Literacy and Numeracy
NESB	Non-English Speaking Background
NT	Northern Territory
NT DET	Northern Territory Department of Education and Training
NSW	New South Wales
PAT	Maths Progressive Achievement Tests in Mathematics
PAT-R	Progressive Achievement Tests in Reading: Comprehension and Vocabulary
<i>QS</i>	<i>QuickSmart</i>
SD	Standard Deviation
SiMERR	National Centre of Science, Information and Communication Technology, and Mathematics Education for Rural and Regional Australia
SNAP	Secondary Numeracy Assessment Program
SPSS	Statistical Package for the Social Sciences

## QUICKSMART STAFF AT SIMERR NATIONAL CENTRE

Associate Professor Lorraine Graham and Professor John Pegg are the co-developers and co-Team Leaders of the *QuickSmart* educational interventions and research project. They are supported by a team of three part-time research associates in the SiMERR National Centre: Jenny Thomas, Noelene Raymond and Eve Croeser.

### Professor John Pegg

John Pegg is the Director of the SiMERR National Centre. In this role John oversees programs in mathematics, science and information and communication technologies that address important educational issues of (i) specific concern to education in rural and regional Australia, and (ii) national concern to education across Australia but ensuring rural and regional voices are represented.

John's work is far ranging, and he is particularly known internationally and nationally for his contribution to theory-based cognition research in Mathematics Education and Assessment. Highlights of his work in this area include over 50 Keynote addresses to national and international research forums, and state and national teacher conferences. Recently he has been the team leader involved in many large-scale nationally significant projects linked to: underachieving students in literacy and basic mathematics, state-wide diagnostic testing programs in science, developmental-based assessment and instruction, the validation of the NSW professional teaching standards, the Maths? Why not? Project, and the ÆSOP study investigating faculties achieving outstanding student-learning outcomes.

John is the co-Team Leader responsible for setting the research agenda for the *QuickSmart* project and overseeing the implementation of *QuickSmart* across sectors and jurisdictions. John also conducts information sessions about *QuickSmart* for educational leaders and leads the presentation of the Professional Development workshops.

### Associate Professor Lorraine Graham

Lorraine Graham is Associate Director (Student Diversity) for the SiMERR National Centre. Her portfolio aims to address issues related to low-achieving, Indigenous and gifted and talented students within the SiMERR network. She is co-developer and co-Team Leader of the *QuickSmart* project, jointly responsible for setting the *QuickSmart* research agenda and maintaining the level of support for implementation offered to jurisdictions, regions and States/Territories.

Lorraine's work is focused on educational intervention research that supports low-achieving students in consolidating basic academic skills. She is a Fellow of the International Academy of Research in Learning Disabilities and has over 60 published academic outcomes including books, journal articles, book chapters and published conference papers.

Lorraine is in charge of the day-to-day coordination of the *QuickSmart* Project in the SiMERR National Centre and across implementation sites. She attends and provides input into the Professional Development workshops, and also oversees and contributes to the development of extensive educational materials, user guides and teacher resources related to the *QuickSmart* program. These user guides,

organizational manuals and collections of templates and educational activities (totalling more than 900 pages) are vital to the implementation and success of the *QuickSmart* numeracy and literacy programs.

### **Ms Jenny Thomas**

Jenny Thomas' role as a Research Associate in the *QuickSmart* Project commenced in 2003. Her role in the *QuickSmart* Project over the last seven years has included instructing in both the *QuickSmart* literacy and numeracy programs in a number of schools and collecting the data required by the project. Jenny has also contributed to developing many of the materials used in both programs. In recent years, Jenny has spent considerable time organising and overseeing the design, printing and development of appropriate packaging for the teaching materials and manuals used in the *QuickSmart* Numeracy Program.

Jenny's other responsibilities include developing workshop materials and assisting in conducting Professional Development workshops. She also ensures the timely packaging and freighting of the *QuickSmart* materials to the workshop venues. In addition, Jenny consults with staff in schools utilising the *QuickSmart* programs through visits to observe, demonstrate and problem solve.

Since 2004 Jenny has been involved on a number of occasions in conducting follow-up research for both the *QuickSmart* Numeracy and Literacy programs. This follow-up research has involved collecting both quantitative and qualitative data. Over the years, Jenny has assisted with the writing of the many reports that are required as outcomes of the various research projects.

### **Ms Noelene Raymond**

Noelene Raymond's role as a Research Associate in the *QuickSmart* Project commenced in 2006 and has involved a variety of tasks, including teaching the *QuickSmart* numeracy program, reviewing and developing materials for the *QuickSmart* literacy program, attending and providing input into the Professional Development workshops, and assisting in the collation and distribution of *QuickSmart* materials.

Noelene's primary current role is to review the *QuickSmart* Literacy program and develop original resources and related research based materials for teaching comprehension, fluency and language skills. The revised *QuickSmart* literacy materials are developed in a way that incorporates Noelene's extensive research of appropriate literature on effective strategies for enhancing the development of written language for students who have learning difficulties. Another important aspect of the *QuickSmart* Literacy program Noelene is developing involves reviewing and amending the CAAS Literacy software in a way that suits the Australian context and supports the content of the revised Literacy program.

Noelene has also conducted follow up interviews with New England Region and North Coast Region students who participated in the *QuickSmart* intervention between 2001 and 2005, and their parents, to provide qualitative data on the maintenance and medium term educational benefits of the program. She has also had the task of entering qualitative data from *QuickSmart* stakeholders to facilitate the data's analysis.



## Ms Eve Croeser

Eve Croeser joined the *QuickSmart* team as a Research Associate in 2008. One of her main tasks in the project has been to reorganize, update and maintain the quantitative databases so that data are in a form that can be imported into SPSS, a software package that is used to analyse the data. Eve has also developed the content for a website for the *QuickSmart* project. Data collection and entry, updating and maintaining the quantitative databases, and developing the *QuickSmart* website are ongoing tasks. Eve has also undertaken a variety of other tasks associated with the *QuickSmart* research project, including assisting other members of the *QuickSmart* team with: the analysis of the quantitative data; writing reports for government funding agencies; reviewing and refining data collection forms to facilitate the more efficient and effective collection of relevant data; and collating and packaging resources posted to schools.



## AWARDS ASSOCIATED WITH QUICKSMART

There have been numerous accolades for the *QuickSmart* program and its outcomes in terms of invited keynote addresses, invited presentations to senior educational personnel, articles in Journals, and written and verbal acknowledgements by participants. As at the time of preparing this Report there have been three independent acknowledgements of the *QuickSmart* program. These are:

### **American Educational Research Association Award in 2007**

In 2007, the importance and international significance of the *QuickSmart* research was acknowledged at the Annual meeting of the American Educational Research Association (AERA) held in Chicago, Illinois. The Annual AERA meeting is the largest conference of educational researchers held in the world. Fifteen thousand researchers attended the 2007 AERA conference. Being selected through a rigorous peer-review process to present a paper session (on average 20 minutes) at this forum is highly competitive, while securing a symposium session of 90 minutes duration is even more sought after.

Importantly, the symposium based on the *QuickSmart* research entitled, *International Perspectives On Quality Educational Research that Supports Students' Learning in Reading and Numeracy*, was highlighted in the conference program as a Presidential Invited Session featuring international education researchers and featuring the AERA 2007 meeting theme of "The World of Educational Quality". This symposium was included as the first symposium session of choice in the conference program supplement under the heading "Program Highlights". The selection of the *QuickSmart* symposium as both a program highlight and a Presidential Invited Session indicates the standing of this research compared to other instances of quality educational research conducted around the world.

### **Anne Bellert's research award 2008: Award for "research on maths intervention program" posted on the UNE News page 24th October 2008**

An outstanding postgraduate student at the University of New England has won a national award for research that will help school students who have difficulty with basic mathematics.

Anne Bellert has won the Learning Difficulties Australia (LDA) Tertiary Student Award for 2008. This is an occasional award through which LDA recognises significant research in the field of learning difficulties.

In a carefully-designed trial, Ms Bellert implemented and assessed an intervention program called *QuickSmart* that gives students confidence in the automatic application of basic skills in mathematics. Her research report, after documenting the successful outcome of the trial, emphasises the importance of helping students struggling with basic mathematics to develop the use of these automatic procedures.

The judges commended Ms Bellert's research for its applicability to students with learning difficulties in a wide range of classroom situations.

Anne Bellert, who works for the Catholic Education Office of the Lismore Diocese, is a PhD student in the UNE-based National Centre of Science, ICT and Mathematics

Education for Rural and Regional Australia (SiMERR). Her academic supervisors, Associate Professor Lorraine Graham and Professor John Pegg (the Director of SiMERR) have led the development of the *QuickSmart* program over the past eight years.

Dr Graham said Ms Bellert's work provided thoroughly documented evidence of the effectiveness of the *QuickSmart* program in "making a difference to students' school performance". "This is important and useful work, given the impact of school failure on individuals' aspirations and society," Dr Graham added.

The President of LDA, Dr Ruth Fielding-Barnsley, presented Ms Bellert with the award during a ceremony in Brisbane at the end of August. In accepting the award, Ms Bellert presented a brief overview of her research, acknowledging the support of her family and her supervisors. She thanked LDA for providing "motivation and encouragement" through the Tertiary Student Award.

Her award-winning research paper will be published in the LDA journal, the *Australian Journal of Learning Disabilities*.

### **The Inaugural Vice Chancellor's Award for Excellence in Research – Team Award, May, 2009**

The Vice-Chancellor's Team Award for Excellence in Research is intended to recognise staff who have demonstrated a highly collaborative approach and outstanding achievement in research in the preceding twelve months. Nominations are supported by evidence that clearly demonstrates the research achievements of the applicants in terms of:

- Outstanding publications as evidenced by peer review;
- Research grant success;
- Commercial success;
- Professional awards or recognition for research activity; and
- Evidence of impact on professional, industry or other practice, or on policies.

The *QuickSmart* program is a research program undertaken by the National Centre of Science, Information and Communication Technology and Mathematics Education for Rural and Regional Australia (SiMERR). The program is concerned with the provision of appropriate interventions delivered in rural and regional education contexts to low-achieving students with the aim of improving their literacy and numeracy performance. Such improvement has clear educational benefit and potential positive long-term social and health implications for all Australians.

The Research Excellence Team award at the University of New England, 2009 was awarded to the five members of the *QuickSmart* Research team. The team comprises Associate Professor Lorraine Graham, Professor John Pegg, Ms Jenny Thomas, Ms Noelene Raymond, and Ms Eve Croeser.

## APPENDICES

See Volume 2 for a full list of Appendices.