

QuickSmart

Annual Literacy Program Report

2023

The SiMERR National Research Centre
The University of New England
ARMIDALE NSW



une
University of
New England

Acknowledgements

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1 *QuickSmart* Executive Summary in 2023

1.1 Introduction

Students who experience ongoing failure in upper-primary and lower-secondary school face a myriad of difficulties in pursuing post-school options and contributing to society through employment and active citizenship. Those who exhibit consistent weaknesses in basic skills, such as the recall of number facts, or who have trouble reading with comprehension are particularly vulnerable. Such students are often caught in a cycle of continued failure, as it is particularly difficult to bring about sustainable change within usual classroom environments for students who by Year 4 are persistently at or below national or state-expected benchmarks.

Four issues confront Australian schools with regard to addressing the needs of at-risk students.

1. Too many Australian Indigenous and non-Indigenous students have shown to be resistant to improvements in learning despite large investments of funds to overcome problems they face. Longitudinal national data indicate that low-achieving students have not drawn lasting benefits from most current in-class and withdrawal instructional activities.
2. Teaching assistants are
 - (i) an underutilised,
 - (ii) poorly supported, and
 - (iii) a seldom recognised resource in school education.Based on *QuickSmart* experience of over 20 years, these adults, with appropriate professional development, are highly motivated, and offer cost-effective, long-term sustainable ways to close the achievement gap for low-achieving students.
3. In remote and rural areas, Indigenous teaching assistants (trained as *QuickSmart* Instructors) are a resource able to enrich their whole community.
4. Educational support programs need to be sustainable in the short- and long-term without large drains on the public purse. Sustainability means
 - (i) cost-efficiency,
 - (ii) clear exit criteria,
 - (iii) proven longitudinal results,
 - (iv) documented ongoing benefits for students and instructors, and
 - (v) replicability (including quality assurance) across all regions of Australia.

1.2 Overview of *QuickSmart* Data

The analyses presented in this report provide information about students' performance in the *QuickSmart* Literacy program. In particular, the focus here is on the Cognitive Aptitude Assessment System, Australian version (OZCAAS) or the *QuickSmart* Basic Skills

Assessor (QBSA), and on standardised test measures, specifically the Progressive Achievement Tests in Vocabulary (V) and Comprehension (C) (ACER, 2008). Some schools provided data for other independent tests, however, there was insufficient use of these tests for inclusion in this report. Further investigation of the data provided in this report examines the results in terms of gender and for participating Indigenous students.

The basic skills assessment data is obtained from the OZCAAS assessment program developed by Academic staff at the Massachusetts's Institute of Technology, or the QBSA, developed by the National Centre of Science, Information and Communication Technology and Mathematics Education for Rural and Regional Australia (SiMERR). Both programs offer a computer-generated, random letter and word testing approach that measures the reaction time (speed) and the accuracy of basic reading skills. The QBSA is an online program with automatic cloud storage of data, whereas OZCAAS stores data locally only.

The results for word recognition and sentence comprehension indicate a strong to substantial improvement for the *QuickSmart* students in terms of accuracy and response time. The evidence provided illustrates that *QuickSmart* students narrowed the achievement gap by

- (i) improving to such an extent that there was either no substantial difference between them and the comparison students, or
- (ii) they had reached a slightly better level of performance than their average-achieving comparison group peers.

Such growth is a critical requirement for these *QuickSmart* students as basic literacy skills are vital for functioning in general. This improvement provides the necessary foundation for students to improve in other areas of the syllabus which are not directly targeted in *QuickSmart*.

1.3 Findings – Response time and Accuracy

In 2023, the *QuickSmart* team at the University of New England received matched data from 645 students who participated in *QuickSmart* Literacy lessons and 123 average-achieving comparison peers. These students were drawn from schools around Australia.

Some small differences between male and female students were observed, but these results were not statistically significant.

In the case of Indigenous students, the gains identified are comparable to those of the overall *QuickSmart* group.

A further mark of the success of *QuickSmart* can be found in the post-test results of those students who did not succeed in completing the pre-test. In such cases, (see Table

14) instructors are advised not to continue collecting data in the pre-test as doing so may confront these students with the extent of their weaknesses at the beginning of the program. Significantly, the fact that these students are now able to complete all Basic Skills assessments at the end of the program is an achievement in and of itself.

In Level 2 Words and Level 3 Words, the average response rates were below 4.6 seconds, with average accuracy above 72%. In Sentence Understanding Level 1 and Sentence Understanding Level 2, the average response rates at the end of the program were below 6.1 seconds, with accuracy results of above 74%. Even though some of these students may not have progressed to Level 3 Words or Sentence Understanding Level 2 during *QuickSmart* lessons, their results are encouraging. It is likely that part of this improvement may be since:

- (i) there has been some mutually beneficial development in processing more difficult words and their meanings,
- (ii) students increased their ability to benefit from classroom instruction; and
- (iii) students improved their levels of confidence which may have led to a 'have a go attitude' that was not present at the beginning of the *QuickSmart* program.

1.4 Findings – ACER tests

In the case of the ACER PAT-V and PAT-C tests, Norm Tables were used to convert raw scores from various forms of the PAT to consistent Scale scores, which were used for all subsequent calculations. Three analyses were undertaken on the PAT scores:

- The first analysis presents a calculation of a standard gain score and the significance of this result.
- The second analysis is an Effect Size calculated from the Means and Standard Deviations on PAT scores for each group. Effect Size statistics indicate the magnitude of the change in academic achievement for the *QuickSmart* and comparison students.
- The third analysis is the shift in national percentile performance.

The results indicate a very strong improvement for *QuickSmart* students in Vocabulary and Comprehension. These improvements are greater than those recorded for the comparison group of average-achieving peers.

In terms of Scale scores, the results indicate that male *QuickSmart* students improved more than female *QuickSmart* students in vocabulary and female students improved more in comprehension. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.084$ for vocabulary and 0.095 for comprehension).

For Indigenous students, the results show very strong improvement in Vocabulary and substantial improvement in Comprehension. The Indigenous students' Comprehension results show greater improvement than the overall *QuickSmart* or comparison group.

Overall, in all analyses, the quantitative data aspects of the program show a narrowing of the achievement gap between *QuickSmart* students and their average-performing comparison group peers. Very strong Effect Sizes have been reported as well as highly significant gains on the part of individual students who, in some cases, initially could not complete the full suite of pre-test assessments.

1.5 Findings – Qualitative Data

Once again, as has been recorded in each year of the *QuickSmart* program, substantial qualitative data (reported in school presentations during professional workshops 2 and 3) indicate that *QuickSmart* students gained a new confidence in literacy as a consequence of their involvement in the program. Many stories, within the corpus of qualitative data, document improvements for *QuickSmart* students in relation to their:

- (i) academic performance and participation in class,
- (ii) attitudes to school and learning,
- (iii) positive attendance rates, and
- (iv) levels of academic confidence both inside and outside the classroom that manifest in a personal belief that with effort and persistence, they can improve.

The data collected to date from many tens of thousands of *QuickSmart* students indicate that

- (i) *QuickSmart* has narrowed the achievement gap between *QuickSmart* and comparison students,
- (ii) low-achieving students undertaking *QuickSmart* proceed with their studies more successfully by learning to 'trust their heads' in the same ways that effective learners do, and
- (iii) *QuickSmart* students can maintain the gains made during the program for years after they completed the program.

1.6 Conclusion

Each year, analyses of the *QuickSmart* program results consistently identify impressive statistically significant end-of-program and longitudinal gains in terms of probability measures and effect sizes that mirror the qualitative improvements reported by teachers, paraprofessionals, parents and *QuickSmart* students themselves.

2 Background

2.1 Purpose of *QuickSmart*

The prime purpose of the *QuickSmart in Schools* program is to reverse the trend of ongoing poor academic performance for students who have been struggling at school and who are caught in a cycle of continued failure. The students targeted by the *QuickSmart* Program typically experience

- (i) significant and sustained difficulties in basic mathematics and/or literacy,
- (ii) have a profile of low progress in learning despite (often many) attempts to overcome their learning difficulties,
- (iii) few if any, lasting benefits from other in-class and withdrawal instructional activities.

A second purpose concerns the professional learning program designed for classroom teachers, special needs support teachers, and paraprofessionals to learn how to work with, and significantly improve, the learning outcomes in basic mathematics and/or literacy of under-achieving middle-school students. The literacy workshop program features:

- (i) professional learning and support for working in a small-group instructional setting with two students, and
- (ii) a specially constructed teaching program supported by extensive material and electronic resources.

2.2 *QuickSmart* Program Description

The *QuickSmart* Numeracy and Literacy interventions were developed and applied nationally through the National Centre of Science, Information and Communication Technology and Mathematics Education for Rural and Regional Australia (SiMERR) at the University of New England, Armidale. The *QuickSmart* programs have been under continuous development and improvement since 2001, based on the results of many tens of thousands of students over more than 20 years of operation.

The intervention is called *QuickSmart* to encourage students to become:

- (i) *quick* in their response time, and
- (ii) *smart* in their understanding and strategic use of mental and other resources.

The aims of *QuickSmart* are to:

- (i) improve students' information retrieval times and accuracy to appropriate levels that enable students to attain and demonstrate proficiency in classroom interactions,

- (ii) free working-memory capacity from an excessive focus on mundane or routine tasks, and, as a result
- (iii) engage in more meaningful tasks associated with more demanding cognitive activities.

In these interventions the words 'Quick' and 'Smart' are operationalised respectively by:

- fostering automaticity of basic and fundamental skills and knowledge, and
- time, accuracy and understanding are incorporated as key dimensions of learning.

Other implications for *QuickSmart* students, and for Schools that conduct the full program, include:

- (i) students' ability to remain on-task is enhanced, resulting in improved efforts to persist and maintain concentration on the material provided,
- (ii) students become more knowledgeable about how the brain learns, in relation to
 - o the value of deliberate practice,
 - o the positive importance of mistakes and learning from them,
 - o the benefits of persevering and how crucial it is to exert effort.
- (iii) students practice the skill of setting realistic goals for themselves and using this idea to help them monitor their own academic learning and progress.
- (iv) all the above skills can be developed, and with consistent practice, these skills can be transferred to classroom use.

2.3 The role of the Literacy lesson structure in fostering understanding

Comprehension skills are emphasised in the *QuickSmart* Literacy program. The three-lesson cycle shown in Figure 1 illustrates how this program focuses on a selected text to develop basic reading skills.

During the first lesson (Introductory Lesson), a text is introduced, and the meaning of the text is discussed. The second *QuickSmart* lesson type (Basic Lesson) is repeated between three and six times to provide support and practice in basic literacy skills. Finally, the third type of lesson (Comprehension Lesson) focuses on developing students' strategies for comprehension and ensuring students can effectively demonstrate their comprehension of the text.

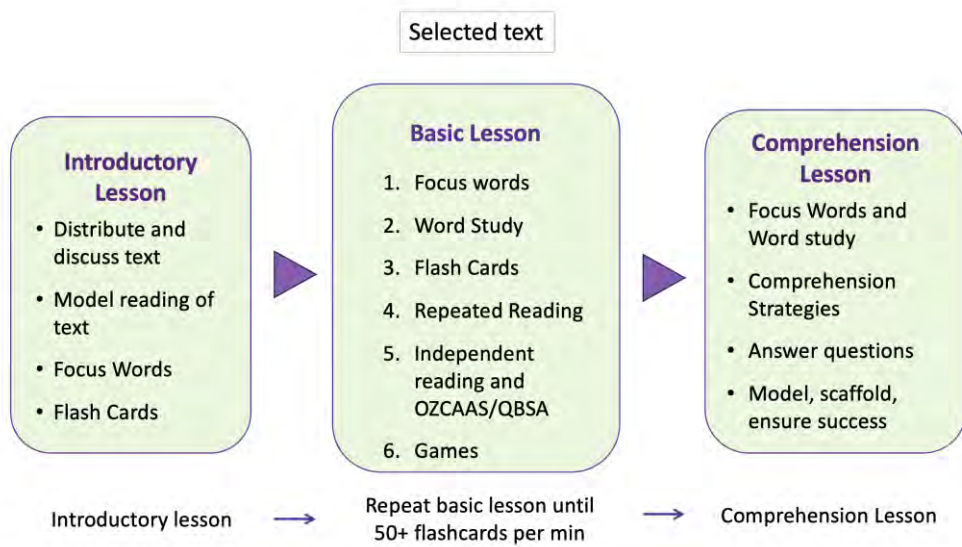


Figure 1: *QuickSmart* Literacy lesson structures

3 *QuickSmart* Tests – 2023

3.1 Introduction

Three major sets of analyses help quantify the academic benefits of the *QuickSmart* program. These analyses are presented in this report and provide information about students' performance:

- (i) on the Basic Skills assessment using either the Cognitive Aptitude Assessment System, Australian version (OZCAAS) or the *QuickSmart* Basic Skills Assessor (QBSA);
- (ii) on standardised test measures, specifically the Progressive Achievement Tests in Vocabulary and Comprehension (ACER, 2008); and
- (iii) in terms of student gender and participating Indigenous students.

The first set of analyses examine response time and accuracy data from either OZCAAS or QBSA measures, related to word recognition and sentence comprehension. These data are collected at the beginning and end of the *QuickSmart* program. These results are a direct measure of the work of *QuickSmart* instructors and reflect the primary focus of the *QuickSmart* lessons.

Six tests are employed to measure students' response time and accuracy both before *QuickSmart* began and at the end of the program. There are four word recognition tests and two sentence comprehension tests. The levels of the comprehension tests are not linked to the levels for vocabulary tests.

The vocabulary tests available are:

- 1. Essential Words;
- 2. Level 1 Words;
- 3. Level 2 Words; and
- 4. Level 3 Words.

The comprehension tests available are:

- 1. Sentence Understanding Level 1; and
- 2. Sentence Understanding Level 2.

The second set of analyses concern the results of independent tests. Most schools have utilised the Progressive Achievement Test (PAT) assessments in Vocabulary (V) and Reading Comprehension (C) for this purpose. These are standardised tests developed by the Australian Council for Education Research (ACER). PAT-V and PAT-C tests are independent tests taken prior to commencement of *QuickSmart* and at the completion of the program. Students' PAT results provide information about how the knowledge,

skills and attitudes developed in *QuickSmart* are used and how they transfer to other broad areas of reading skill, which **are not** the specific target of *QuickSmart* instruction.

The third set of analyses includes analyses of the data by gender and participating Indigenous students.

The results from these three analysis groups are reported below in separate sections. (Note: Some schools provided data for other independent tests, however, there was insufficient national use of these tests for inclusion in this report.)

3.2 Background to Test Interpretation

For all tests in this study (Basic Skills, PAT-V and PAT-C) the comparison group represents average-achieving students selected from the same class (or Year/Grade) as *QuickSmart* students. The comparison students are expected to undertake the pre-intervention and post-intervention tests but do not receive any *QuickSmart* small-group instruction. The initial difference in the two groups, comparison and *QuickSmart* students, is demonstrated in all tables of results in this Report with comparison students achieving better average pre-intervention scores than students in the *QuickSmart* group.

Note: The comparison students do not represent a ‘true’ control group because they do not share the same achievement starting points with the *QuickSmart* students. Typically, the comparison students are average-achieving students, while the *QuickSmart* students are low-achieving students. This clarification is not to say that some comparison students might not benefit (some greatly) from the *QuickSmart* program themselves. Data from schools confirm that when these middle-performing students are given access to the *QuickSmart* program they make substantive gains, often in a shorter timeframe of less than 30 weeks. However, with limited resources available in schools, it is clearly the lower-achieving students who are most in need. The good news is that the benefits of *QuickSmart* thinking and practice is not limited to the lower-achieving students.

As is often the case in educational studies of this nature, to obtain a ‘true’ control group could be ethically problematic since this would potentially deprive a selected group of low-achieving students of the educational benefits that other low-achieving students, (often) in the same class would receive. Thus, even though the results in this report consistently show that the *QuickSmart* students improve more than the comparison students, it has to be borne in mind that, if the comparison group consisted of low-achieving students, it is most likely that the *QuickSmart* students would show a greater margin of improvement relative to that group than of our traditional comparison students.

Additionally, as *QuickSmart* programs become established in schools, sometimes even within the first year of operation, it becomes increasingly difficult to establish even a

true 'comparison' group. This occurs as more and more *QuickSmart* practitioners share *QuickSmart* teaching practices, resources and activities throughout their schools. Our information from school reports is that a majority of principals begin this school-wide implementation of *QuickSmart* in their schools within the first two to three years.

While this attests to the impact that *QuickSmart* is having in schools, it does not allow a straightforward interpretation of comparison students and *QuickSmart* student results. Specifically, in many schools, average-achieving comparison students are receiving some experience with *QuickSmart* approaches, activities and resources in their classrooms, and consequently, their scores are higher at post-test because of this exposure.

It should also be noted that to obtain the difference between the improvement of *QuickSmart* students and comparison students, we analysed the data using paired-samples *t*-tests. To protect against the cascading Type I error associated with multiple *t*-tests we lowered the significance level from the customary 0.05 to 0.01.

The reason for this is to adjust for the situation where *t*-tests are repeated many times. This repetition means that, on average, the decision that the means of two groups are significantly different would be incorrect one time in every one hundred replications. The implication of the change means that in our analysis, for any two means to be judged significantly different from each other, there has to be a less than 1% chance (as opposed to a 5% chance) that the result was obtained by chance.

4 Results on the Basic Skills Assessments

4.1 Introduction

In 2023, the *QuickSmart* team at the University of New England received data from 645 students who participated in *QuickSmart* Literacy lessons and 123 ‘average-achieving’ comparison peers. These students were drawn from schools across Australia.

To assist with interpretation of Basic Skills results, Level 3 Words and Sentence Understanding Level 2 are shown first, as these tests show the effect of the program most clearly. It is important to note that interpretation of results in some tests (e.g., Essential Words) can be impacted by a ‘ceiling effect’ as many students record strong results in the pre-test and this does not leave much room for improvement.

The Basic Skills results recorded for average-achieving comparison students should also be interpreted with the knowledge that many of these students’ results may have been constrained by a ceiling effect.

The results of our analyses of data related to Basic Skills are presented in Tables 1 to 6 below. Detailed discussions of Tables 1 and 2 are provided for clarification purposes and as a model for understanding the results provided in Tables 3 to 6.

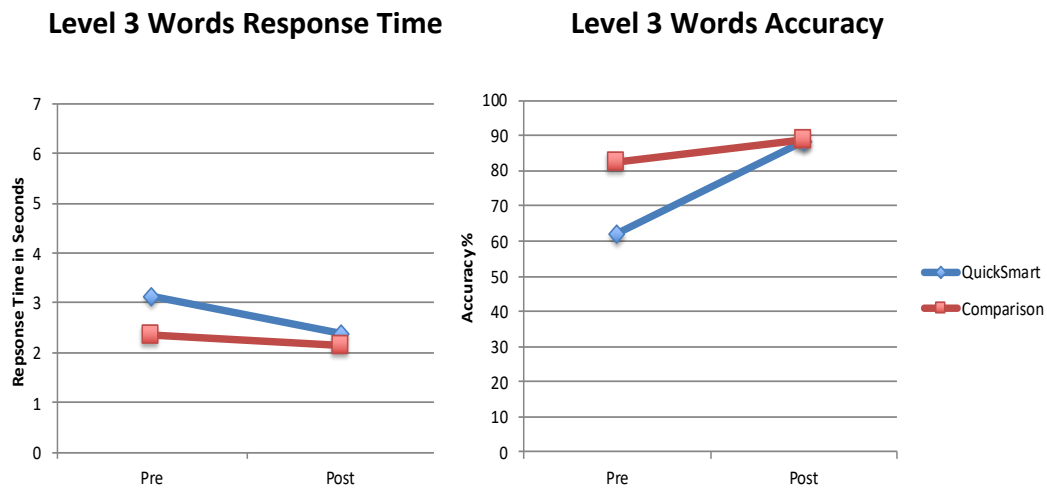
4.2 Combined Basic Skills Analysis

4.2.1 Level 3 Words

Table 1 summarises the data submitted for Basic Skills Level 3 Words.

Table 1: Basic Skills Level 3 Words results – all students 2023

Level 3 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Res Time (secs) QS	546	3.119	2.274	2.369	1.823	-0.75	<0.001*	0.364
Res Time (secs) Comp	113	2.367	1.457	2.157	1.194	-0.21	0.109	0.158
Accuracy (%) QS	546	62.274	24.183	88.482	18.8	26.208	<0.001*	1.21
Accuracy (%) Comp	113	82.642	16.206	88.832	14.367	6.19	<0.001*	0.404



On the Level 3 Words test, there were paired data for 546 *QuickSmart* students and 113 comparison students. The desired criterion for response time on the Basic Skills assessments for words is between 1 and 2 seconds as an indication of automaticity. The decrease in time on these difficult words for *QuickSmart* students is 0.75 seconds. (Note: The negative number in the table means that the post-test time is lower than the pre-test time. This result is the desired pattern of improvement). The effect size for this result is 0.364, which indicates appropriate improvement.

Effect size statistics can be understood based on the work of John Hattie (2009), *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement* and Hattie (2023), *Visible Learning: The Sequel: A synthesis of over 2,100 meta-analyses relating to achievement*, such that over an academic year for a student cohort:

- Effect sizes below 0.2 are considered **poor**;
- Effect sizes within the range of 0.2 to 0.4 are considered **appropriate**;
- Effect sizes within the range of 0.4 to 0.6 are considered **strong**;
- Effect sizes within the range of 0.6 and 0.8 are considered **very strong**; and
- Effect sizes above 0.8 are considered **substantial improvement** of the order of nearly two-to-three years' growth.

In terms of accuracy, the *QuickSmart* students' average scores have improved by over 26 percentage points, which is a very strong result. The effect size of 1.21 indicates a substantial improvement for the *QuickSmart* group.

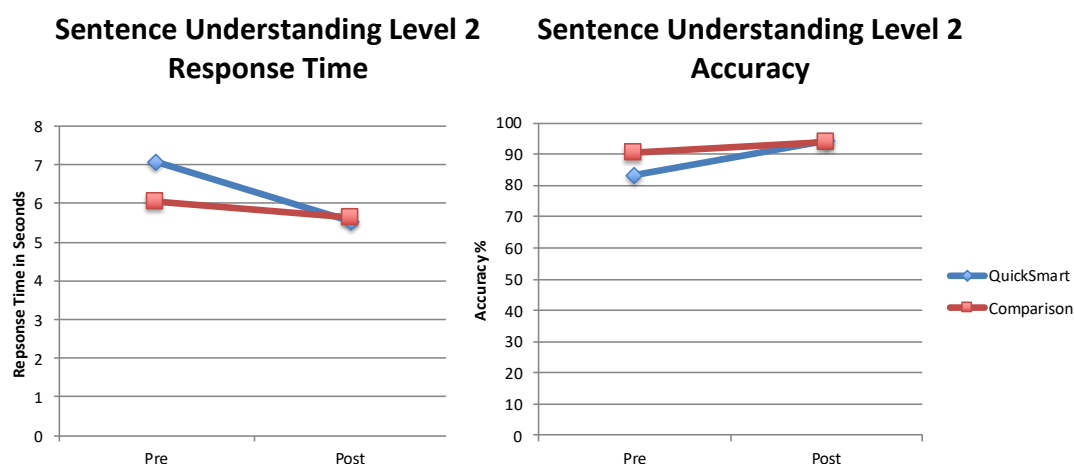
In summary, Table 1 shows that when compared to the scores of the comparison students, *QuickSmart* students' scores indicate greater improvement in terms of response time and accuracy with Level 3 Words. The graphs illustrate the narrowing of the gap between the *QuickSmart* students and comparison students as a result of the *QuickSmart* intervention.

4.2.2 Sentence Understanding Level 2

Table 2 summarises the data submitted for Basic Skills for Sentence Understanding Level 2.

Table 2: Basic Skills Sentence Understanding Level 2 – all students 2023

Sentence Understanding Level 2	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Res Time (secs) QS	546	7.084	3.152	5.536	2.398	-1.548	<0.001*	0.553
Res Time (secs) Comp	112	6.031	2.196	5.642	1.547	-0.389	0.036	0.204
Accuracy (%) QS	546	83.434	14.837	94.383	8.602	10.949	<0.001*	0.903
Accuracy (%) Comp	112	90.575	9.095	93.846	7.886	3.271	0.003	0.384



On the Sentence Understanding Level 2 test, there were paired data for 546 *QuickSmart* students and 112 comparison students. This test required students to choose the best alternative of two words to complete a sentence. It is a test of sentence-level cloze

reading skills. The desired criterion for response time on the Basic Skills assessments for comprehension is between 3 and 4 seconds as an indication of automaticity. The decrease in time for *QuickSmart* students is 1.548 seconds, which is a strong result. The effect size for this result is 0.553, which indicates strong improvement.

In terms of accuracy, the *QuickSmart* students' average scores have improved by more than 10 percentage points, which is a strong result. The effect size is 0.903, which indicates substantial improvement for the *QuickSmart* group.

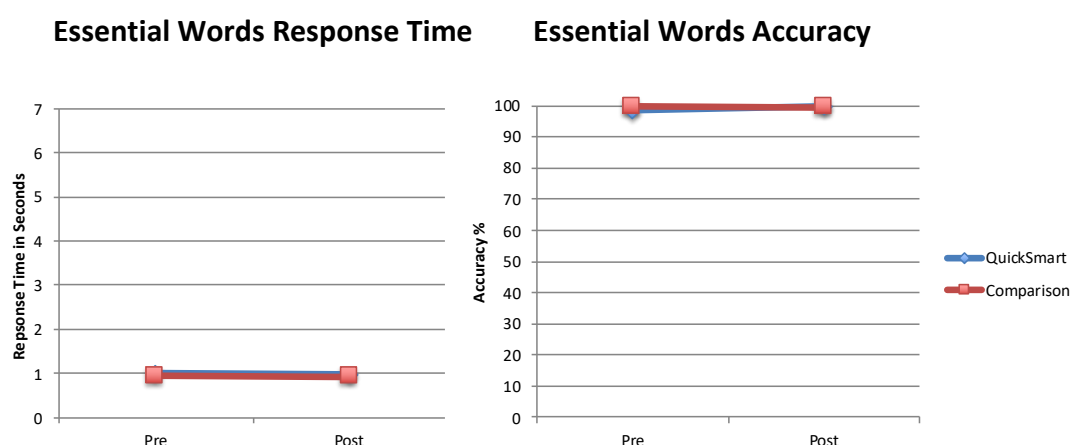
In summary, Table 2 shows that when compared to the scores of the comparison students, *QuickSmart* students' scores indicate greater improvement in terms of response time and accuracy in Sentence Understanding Level 2. The diagrams illustrate that as a result of the *QuickSmart* intervention, the *QuickSmart* students improved to such an extent that there was no substantial difference between them and the comparison students.

4.2.3 Essential Words

Table 3: Basic Skills Essential Words – all students 2023

Essential Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Res Time (secs) QS	557	1.013	0.505	0.983	0.423	-0.030	0.209	0.063
Res Time (secs) Comp	110	0.946	0.306	0.944	0.411	-0.002	0.975	0.004
Accuracy (%) QS	557	98.637	6.379	99.805	1.54	1.168	<0.001*	0.252
Accuracy (%) Comp	110	99.906	0.692	99.853	1.139	-0.053		NI [#]

[#] No Improvement



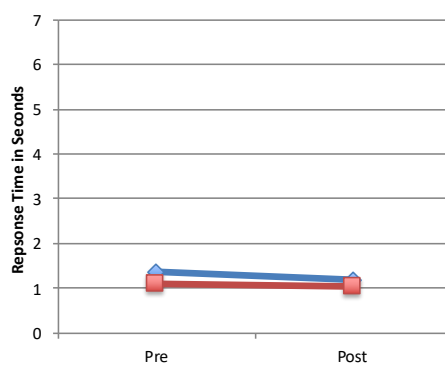
In summary, the results for Essential Words, the most commonly used words that should be known by middle school students, indicate a stronger improvement for the *QuickSmart* students than for the comparison students. However, both the response time and accuracy results show a strong ceiling effect as the results were already at a high level at pre-test for both groups.

4.2.4 Level 1 Words

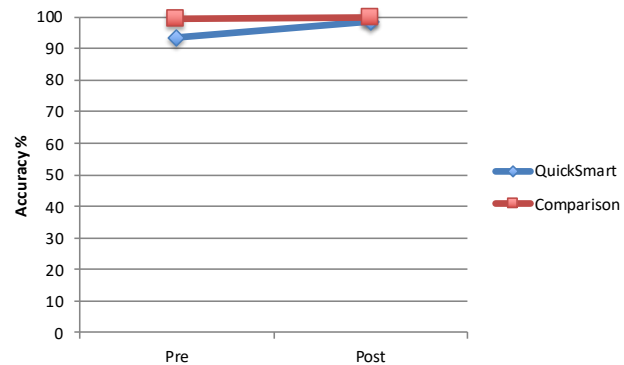
Table 4: Basic Skills Level 1 Words – all students 2023

Level 1 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Res Time (secs) QS	585	1.377	0.919	1.175	0.55	-0.202	<0.001*	0.267
Res Time (secs) Comp	111	1.085	0.355	1.035	0.376	-0.05	0.19	0.137
Accuracy (%) QS	585	93.361	12.346	98.559	5.478	5.198	<0.001*	0.544
Accuracy (%) Comp	111	99.258	2.72	99.666	1.294	0.408	0.086	0.192

Level 1 Words Response Time



Level 1 Words Accuracy



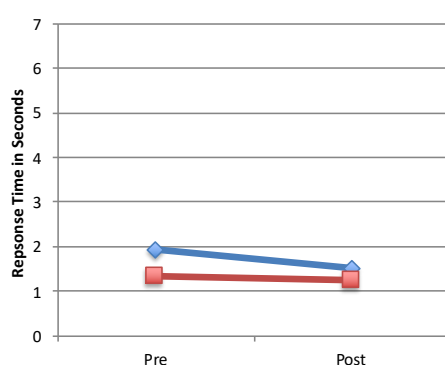
In summary, the results for Level 1 Words indicate an appropriate improvement for the *QuickSmart* students in response time and a strong improvement in accuracy. The diagrams illustrate that as a result of the *QuickSmart* intervention, the *QuickSmart* students narrowed the gap to the comparison students in both response time and accuracy. However, both response time and accuracy results show a strong ceiling effect at this level.

4.2.5 Level 2 Words

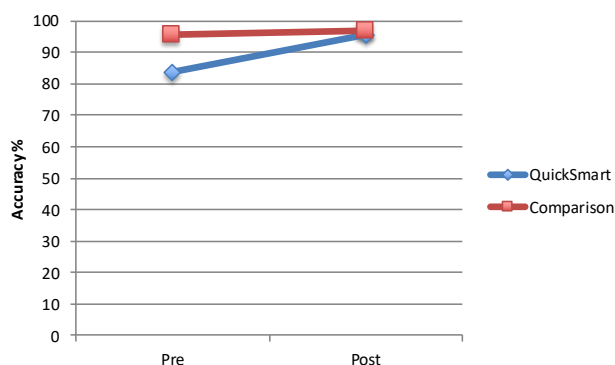
Table 5: Basic Skills Level 2 Words – all students 2023

Level 2 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Res Time (secs) QS	571	1.934	1.481	1.5	1.004	-0.434	<0.001*	0.343
Res Time (secs) Comp	112	1.342	0.635	1.25	0.471	-0.092	0.125	0.165
Accuracy (%) QS	571	83.52	18.989	95.764	10.226	12.244	<0.001*	0.803
Accuracy (%) Comp	112	95.439	6.321	96.911	5.721	1.472	0.014	0.244

Level 2 Words Response Time



Level 2 Words Accuracy



The results for Level 2 Words indicate an appropriate improvement for the *QuickSmart* students in response time and substantial improvement in accuracy. The diagrams illustrate that the *QuickSmart* students narrowed the gap to the comparison students in both response time and accuracy.

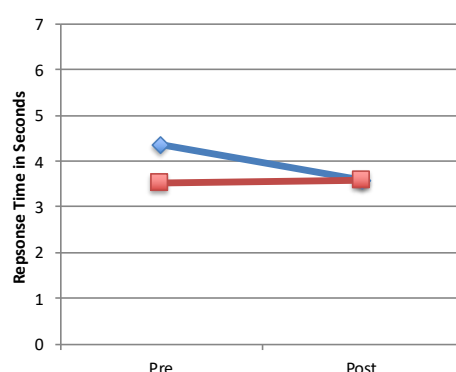
4.2.6 Sentence Understanding Level 1

Table 6: Basic Skills Sentence Understanding Level 1 – all students 2023

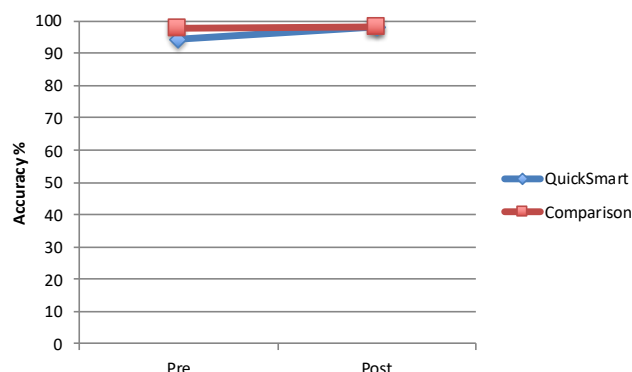
Sentence Understanding Level 1	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Res Time (secs) QS	578	4.372	2.235	3.57	1.475	-0.802	<0.001*	0.424
Res Time (secs) Comp	112	3.512	1.125	3.596	1.401	0.084		NI [#]
Accuracy (%) QS	578	94.304	11.602	98.078	5.709	3.774	<0.001*	0.413
Accuracy (%) Comp	112	97.561	6.787	97.995	4.964	0.434	0.423	0.073

[#] No Improvement

Sentence Understanding Level 1 Response Time



Sentence Understanding Level 1 Accuracy



In summary, the results for Sentence Understanding Level 1 indicate a strong improvement for the *QuickSmart* students in response time and accuracy. The diagrams illustrate that the *QuickSmart* students narrowed the gap to the comparison students in response time. In accuracy, they improved to such an extent that there was no

substantial difference between them and the comparison students. The accuracy results show a strong ceiling effect.

4.3 Basic Skills By Demographics

4.3.1 Essential Words by Gender

The following tables show an analysis of Basic Skills results for each test by gender (Tables 7, 8, 9, 10, 11, 12) and for Indigenous students (Table 13).

Table 7: Basic Skills Essential Words results – all students by gender 2023

Essential Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Response Time (seconds)								
Male <i>QuickSmart</i>	263	0.999	0.543	0.944	0.442	-0.055	0.113	0.11
Male Comparison	39	0.869	0.232	0.947	0.497	0.078		NI [#]
Female <i>QuickSmart</i>	198	1.007	0.507	0.946	0.394	-0.061	0.132	0.135
Female Comparison	40	0.983	0.397	1.02	0.435	0.037		NI [#]
Not indicated <i>QuickSmart</i>	96	1.063	0.377	1.17	0.377	0.107		NI [#]
Not indicated Comparison	31	0.994	0.236	0.843	0.19	-0.151	<0.001*	0.707
Accuracy (%)								
Male <i>QuickSmart</i>	263	98.7	5.204	99.683	2.126	0.983	<0.001*	0.247
Male Comparison	39	99.872	0.801	100.0	0.0	0.128	0.324	0.226
Female <i>QuickSmart</i>	198	98.405	8.29	99.897	0.716	1.492	0.012	0.254
Female Comparison	40	100.0	0.0	99.595	1.875	-0.405		NI [#]
Not indicated <i>QuickSmart</i>	96	98.945	4.55	99.948	0.51	1.003	0.03	0.31
Not indicated Comparison	31	99.829	0.952	100.0	0.0	0.171	0.325	0.254

[#] No Improvement

In summary, the results of *QuickSmart* students show that in both the response time and accuracy the females have improved more than the males. However, care should be exercised in interpreting these results because they exhibit a very strong ceiling effect.

4.3.2 Level 1 Words by Gender

Table 8: Basic Skills Level 1 Words results – all students by gender 2023

Level 1 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Response Time (seconds)								
Male <i>QuickSmart</i>	277	1.337	0.872	1.127	0.502	-0.21	<0.001*	0.296
Male Comparison	39	1.033	0.376	1.002	0.419	-0.031	0.699	0.077
Female <i>QuickSmart</i>	212	1.371	0.904	1.139	0.513	-0.232	<0.001*	0.315
Female Comparison	41	1.113	0.382	1.129	0.398	0.016		NI [#]
Not indicated <i>QuickSmart</i>	96	1.509	1.068	1.395	0.699	-0.114	0.294	0.127
Not indicated Comparison	31	1.114	0.286	0.953	0.254	-0.161	0.001	0.595
Accuracy (%)								
Male <i>QuickSmart</i>	277	92.871	12.945	98.214	6.593	5.343	<0.001*	0.52
Male Comparison	39	99.6	1.404	99.592	1.431	-0.008		NI [#]
Female <i>QuickSmart</i>	212	94.478	11.072	98.77	4.482	4.292	<0.001*	0.508
Female Comparison	41	98.5	4.103	99.741	1.156	1.241	0.029	0.412
Not indicated <i>QuickSmart</i>	96	92.304	13.166	99.09	3.585	6.786	<0.001*	0.703
Not indicated Comparison	31	99.829	0.952	99.658	1.324	-0.171		NI [#]

[#] No Improvement

In summary, the results of *QuickSmart* students show that in the response time the females have improved slightly more than the males and in accuracy the males have improved more than the females. However, care should be exercised in interpreting these results because they exhibit a strong ceiling effect.

4.3.3 Level 2 Words by Gender

Table 9: Basic Skills Level 2 Words results – all students by gender 2023

Level 2 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Response Time (seconds)								
Male <i>QuickSmart</i>	271	1.826	1.349	1.395	0.893	-0.431	<0.001*	0.376
Male Comparison	39	1.148	0.531	1.232	0.544	0.084		NI
Female <i>QuickSmart</i>	204	1.98	1.439	1.434	0.816	-0.546	<0.001*	0.467
Female Comparison	42	1.528	0.822	1.315	0.488	-0.213	0.099	0.316
Not indicated <i>QuickSmart</i>	96	2.143	1.865	1.939	1.457	-0.204	0.163	0.122
Not indicated Comparison	31	1.334	0.341	1.184	0.33	-0.15	0.023	0.446
Accuracy (%)								
Male <i>QuickSmart</i>	271	83.865	19.899	95.743	10.583	11.878	<0.001*	0.745
Male Comparison	39	96.526	5.358	97.313	5.016	0.787	0.483	0.152
Female <i>QuickSmart</i>	204	82.996	18.581	95.777	9.584	12.781	<0.001*	0.865
Female Comparison	42	93.852	7.958	96.138	7.042	2.286	0.029	0.304
Not indicated <i>QuickSmart</i>	96	83.662	17.303	95.797	10.624	12.135	<0.001*	0.845
Not indicated Comparison	31	96.223	4.383	97.452	4.487	1.229	0.173	0.277

In summary, the results of *QuickSmart* students show that in both the response time and accuracy the females have improved more than the males. The Independent sample

t-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.346$ for response time and 0.534 for accuracy).

4.3.4 Level 3 Words by Gender

Table 10: Basic Skills Level 3 Words results – all students by gender 2023

Level 3 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Response Time (seconds)								
Male <i>QuickSmart</i>	254	2.936	2.213	2.071	1.395	-0.865	<0.001*	0.468
Male Comparison	40	1.969	1.412	1.769	0.936	-0.2	0.331	0.167
Female <i>QuickSmart</i>	199	3.113	1.959	2.249	1.609	-0.864	<0.001*	0.482
Female Comparison	42	2.61	1.408	2.475	1.4	-0.135	0.526	0.096
Not indicated <i>QuickSmart</i>	93	3.635	2.92	3.442	2.705	-0.193	0.487	0.069
Not indicated Comparison	31	2.553	1.514	2.228	1.075	-0.325	0.252	0.247
Accuracy (%)								
Male <i>QuickSmart</i>	254	64.314	24.684	88.931	18.994	24.617	<0.001*	1.118
Male Comparison	40	89.765	12.372	91.748	12.133	1.983	0.393	0.162
Female <i>QuickSmart</i>	199	61.101	23.932	87.699	18.716	26.598	<0.001*	1.238
Female Comparison	42	79.224	16.577	84.569	17.435	5.345	0.031	0.314
Not indicated <i>QuickSmart</i>	93	59.213	23.072	88.933	18.595	29.72	<0.001*	0.877
Not indicated Comparison	31	78.081	17.335	90.845	11.081	12.764	<0.001*	1.418

In summary, the results of *QuickSmart* students show that in the response time the males have a slightly higher gain than the females and in accuracy the females have improved more than the males. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.994$ for response time and 0.296 for accuracy).

4.3.5 Sentence Understanding Level 1 by Gender

Table 11: Basic Skills Sentence Understanding Level 1 results – all students by gender 2023

Sentence Understanding Level 1	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Response Time (seconds)								
Male <i>QuickSmart</i>	277	4.195	1.848	3.518	1.454	-0.677	<0.001*	0.407
Male Comparison	39	3.172	1.079	3.449	0.977	0.277		NI
Female <i>QuickSmart</i>	208	4.523	2.167	3.55	1.56	-0.973	<0.001*	0.515
Female Comparison	42	3.898	1.234	4.059	1.933	0.161		NI
Not indicated <i>QuickSmart</i>	93	4.563	3.215	3.767	1.336	-0.796	0.014	0.323
Not indicated Comparison	31	3.415	0.868	3.153	0.645	-0.262	0.049	0.342
Accuracy (%)								
Male <i>QuickSmart</i>	277	94.809	9.623	97.793	6.227	2.984	<0.001*	0.368
Male Comparison	39	99.405	2.205	98.974	3.909	-0.431		NI
Female <i>QuickSmart</i>	208	94.186	11.452	98.064	5.959	3.878	<0.001*	0.425
Female Comparison	42	95.893	10.272	96.931	6.022	1.038	0.346	0.123
Not indicated <i>QuickSmart</i>	93	93.063	16.398	98.957	2.68	5.894	<0.001*	0.502
Not indicated Comparison	31	97.5	3.431	98.203	4.401	0.703	0.46	0.178

In summary, the results of *QuickSmart* students show that in both the response time and accuracy the females have improved more than the males. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.092$ for response time and 0.343 for accuracy).

4.3.6 Sentence Understanding Level 2 by Gender

Table 12: Basic Skills Sentence Understanding Level 2 results – all students by gender 2023

Sentence Understanding Level 2	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Response Time (seconds)								
Male <i>QuickSmart</i>	256	6.805	3.214	5.36	2.272	-1.445	<0.001*	0.519
Male Comparison	39	5.811	2.135	5.603	1.746	-0.208	0.418	0.106
Female <i>QuickSmart</i>	198	7.329	3.118	5.595	2.687	-1.734	<0.001*	0.596
Female Comparison	42	6.269	2.581	5.851	1.533	-0.418	0.276	0.197
Not indicated <i>QuickSmart</i>	92	7.336	3.015	5.902	2.025	-1.434	<0.001*	0.559
Not indicated Comparison	31	5.984	1.681	5.409	1.292	-0.575	0.045	0.383
Accuracy (%)								
Male <i>QuickSmart</i>	256	83.909	14.33	95.052	7.804	11.143	<0.001*	0.966
Male Comparison	39	92.467	7.717	95.156	6.269	2.689	0.118	0.383
Female <i>QuickSmart</i>	198	83.373	15.805	94.32	9.117	10.947	<0.001*	0.848
Female Comparison	42	89.988	9.511	93.193	9.009	3.205	0.066	0.346
Not indicated <i>QuickSmart</i>	92	82.244	14.149	92.654	9.392	10.41	<0.001*	0.867
Not indicated Comparison	31	88.99	9.964	93.081	8.121	4.091	0.093	0.45

In summary, the results of *QuickSmart* students show that in the response time the females have improved slightly more than the males and in accuracy the males have improved more than the females. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.338$ for response time and 0.889 for accuracy).

4.3.7 Indigenous Students

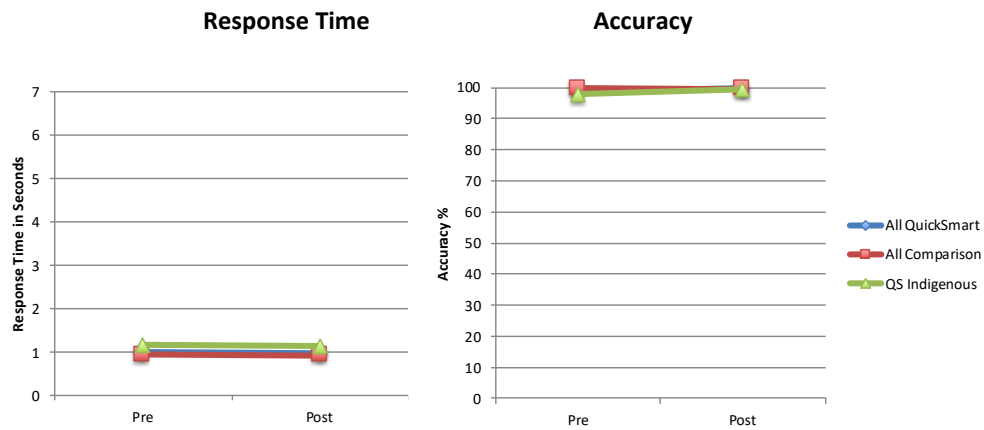
Table 13: Basic Skills results – Indigenous *QuickSmart* students 2023

Test	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Essential Words								
Response time (seconds)	60	1.167	0.772	1.129	0.437	-0.038	0.7	0.061
Accuracy (%)	60	97.778	8.233	99.653	2.129	1.875	0.07	0.312
Level 1 Words								
Response time (seconds)	60	1.422	0.81	1.264	0.552	-0.158	0.118	0.228
Accuracy (%)	60	91.505	14.334	98.922	4.819	7.417	<0.001*	0.694
Level 2 Words								
Response time (seconds)	60	2.031	1.304	1.658	1.145	-0.373	0.054	0.304
Accuracy (%)	60	81.317	21.755	96.797	10.08	15.48	<0.001*	0.913
Level 3 Words								
Response time (seconds)	56	3.057	2.424	2.173	1.495	-0.884	0.013	0.439
Accuracy (%)	56	63.873	25.498	91.987	16.218	28.114	<0.001*	1.316
Sentence Understanding Level 1								
Response time (seconds)	58	4.14	1.836	3.654	1.425	-0.486	0.085	0.296
Accuracy (%)	58	96.117	8.316	99.134	2.588	3.017	0.002	0.49
Sentence Understanding Level 2								
Response time (seconds)	54	6.874	2.791	5.88	2.475	-0.994	0.044	0.377
Accuracy (%)	54	87.695	9.821	93.958	7.968	6.263	<0.001*	0.7

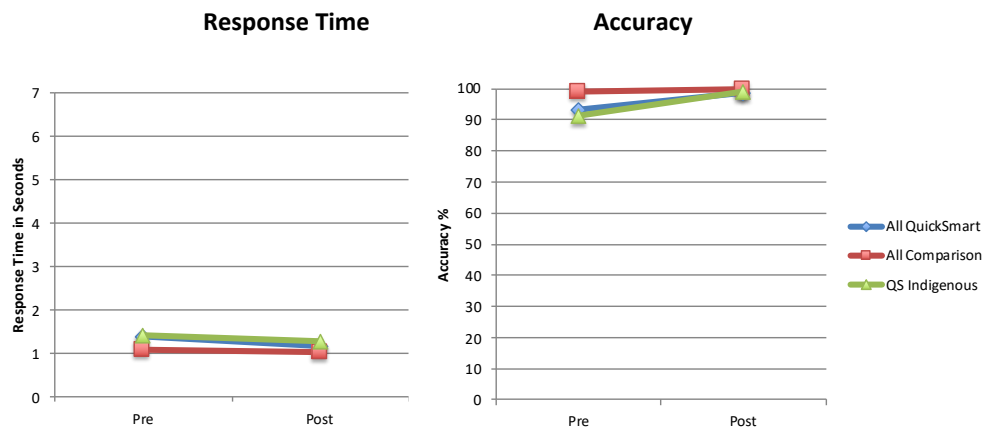
These results indicate that the Indigenous students' gains are comparable to those of the overall *QuickSmart* group. For Essential Words and Level 1 Words, both the response time and accuracy results are impacted by the ceiling effect (the pre-intervention scores were so high that the students did not have much room for further improvement). For Sentence Understanding Level 1 the accuracy results exhibit the ceiling effect.

The following graphs illustrate how the Indigenous students (green) have performed in each test compared to the whole *QuickSmart* group (blue) as well as the comparison students (red).

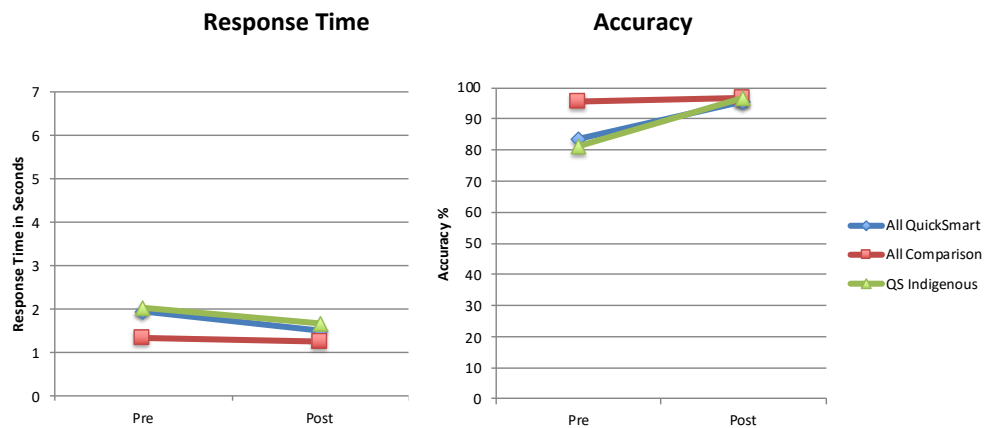
Essential Words



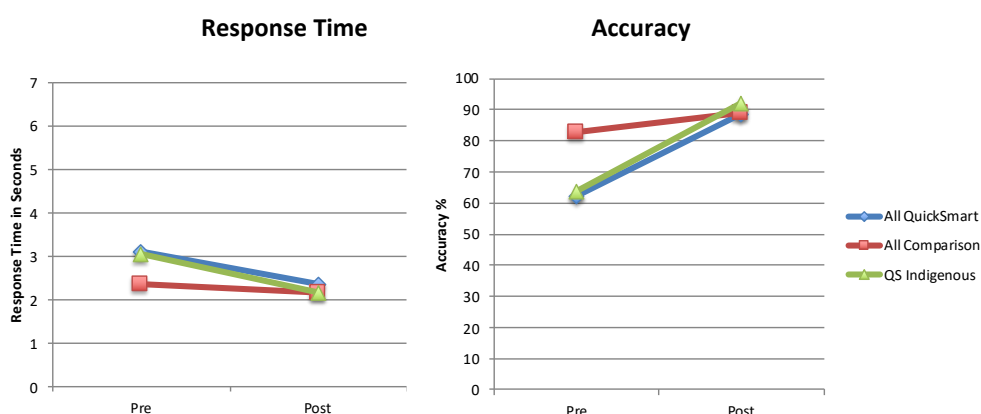
Level 1 Words



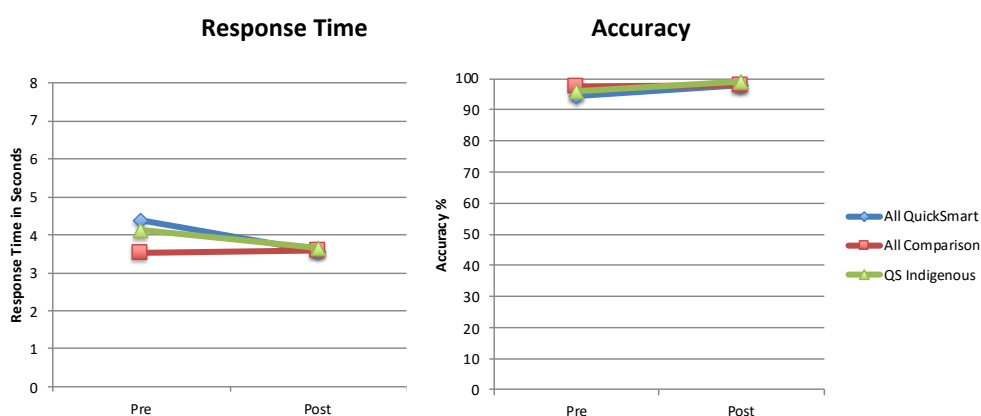
Level 2 Words



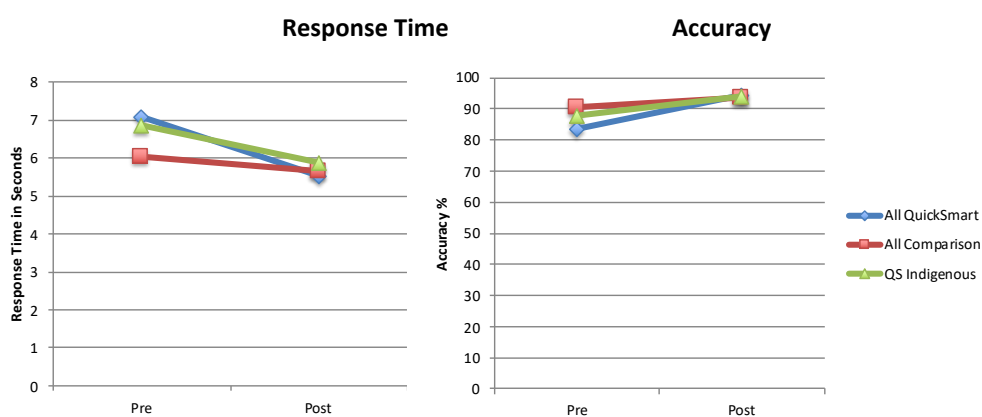
Level 3 Words



Sentence Understanding Level 1



Sentence Understanding Level 2



4.4 Students Who Were Unable to Complete the Pre-Intervention Test

There were students who instructors confirmed were not able to complete Basic Skills pre-tests. Our advice is not to continue collecting data where doing so may lead to undue stress for these students at the beginning of the program.

A mark of the success of *QuickSmart* is that many of these students **did** complete all Basic Skills assessments at the end of the program. These students' results could not be included in the previous analyses and are presented in Table 14 below.

Table 14: Basic Skills results where no pre-test data were available – 2023

	N	Mean	Std. Deviation
Essential Words			
Response time (seconds)			
Accuracy (%)			
Level 1 Words			
Response time (seconds)			
Accuracy (%)			
Level 2 Words			
Response time (seconds)	3	4.591	2.322
Accuracy (%)	3	78.33	33.292
Level 3 Words			
Response time (seconds)	5	2.794	2.624
Accuracy (%)	5	72.12	35.175
Sentence Understanding Level 1			
Response time (seconds)	5	5.343	4.11
Accuracy (%)	5	94.28	12.79
Sentence Understanding Level 2			
Response time (seconds)	15	6.072	3.588
Accuracy (%)	15	74.284	17.105

The results in Table 14 are impressive given that these students did not have the skills or confidence to complete the Basic Skills pre-tests. In Level 2 Words and Level 3 Words, the average response rates were below 4.6 seconds, with average accuracy above 72%. In Sentence Understanding Level 1 and Sentence Understanding Level 2, the average response rates at the end of the program were below 6.1 seconds, with accuracy results of above 74%. Even though some of these students may not have progressed to Level 3 Words or Sentence Understanding Level 2 during *QuickSmart* lessons, their results are encouraging. It is likely that part of this improvement may be since:

- (iv) there has been some mutually beneficial development in processing more difficult words and their meanings,
- (v) students increased their ability to benefit from classroom instruction; and
- (vi) students improved their levels of confidence which may have led to a 'have a go attitude' that was not present at the beginning of the *QuickSmart* program.

4.5 Conclusion for Basic Skills Testing

Overall, the *QuickSmart* students showed strong growth in their understanding and use of reading skills. At all levels, they either closed the gap between their scores and those of average-achieving comparison students or narrowed this gap to a very small margin. Such growth is critical for these students, as reading is a vital skill underpinning learning in general.

The improvement identified provides the foundation for students to improve in areas related to the application of reading skills that are not specifically taught in *QuickSmart*. This is because of both direct and indirect aspects of *QuickSmart* lessons.

- (i) The direct benefits of automating the recognition of many words and their meanings.

- (ii) The indirect benefits of deliberate practice in persistence, concentrating on a particular area, working with a peer, clear attainable goals that can be achieved through demonstrated effort, recognising the power and usefulness of learning from mistakes, and the nurturing of an adult who cares and believes in the student and has appropriate high expectations that the student can succeed.

Some small differences between male and female students were observed. However, these do not reveal any consistent trend and do not warrant further investigation.

The Indigenous students showed improvements comparable to those of the overall *QuickSmart* group.

5 Independent Assessments

5.1 Why They are Used

The *QuickSmart* pre- and post-assessments include independent tests to demonstrate whether students can take the basic knowledge and strategies taught in *QuickSmart* and apply these to higher-level literacy tasks.

5.2 Results on the PAT-V and PAT-C Assessments

Table 15 reports the analysis of the PAT data for all students for whom paired data were available. PAT analyses for individual states are provided in an Appendix to this report. (Note: Students who were absent at the end of the year were not included in the analysis). Separate PAT test analyses are provided for Vocabulary and Comprehension.

The PAT Norm Tables were used to convert raw scores from various levels of the PAT test to consistent Scale scores, which were used for all subsequent calculations. Two analyses are reported in Table 15.

The first analysis presents a calculation of a standard gain score and the statistical significance of this result. The second analysis is an Effect Size calculated from the Means and Standard Deviations on PAT scores for each group. Effect size statistics indicate the magnitude of the change in academic achievement for the *QuickSmart* and comparison students.

Table 15: PAT-V and PAT-C results – (Scale scores) 2023

Group	Students with paired data	Average Gain score	Significance	Effect size
Vocabulary				
All <i>QuickSmart</i>	179	6.412	<0.001*	0.691
All Comparison	23	0.266	0.844	0.034
Comprehension				
All <i>QuickSmart</i>	247	6.723	<0.001*	0.74
All Comparison	72	3.951	<0.001*	0.532

The results indicate a very strong improvement for *QuickSmart* students in both Vocabulary and Comprehension. These improvements are greater than those recorded for the comparison group of average-achieving peers.

Table 16 reports the same information as Table 15 but shows a comparison of male and female students included in the *QuickSmart* program.

Table 16: PAT-V and PAT-C results – by Gender (Scale scores) 2023

Gender	Students with paired data	Average Gain score	Significance	Effect size
Vocabulary				
<i>QuickSmart</i> Male	111	7.314	<0.001*	0.808
Comparison Male	9	-0.255		NI
<i>QuickSmart</i> Female	68	4.941	<0.001*	0.517
Comparison Female	14	0.6	0.751	0.081
<i>QuickSmart</i> Not Indicated	0			
Comparison Not Indicated	0			
Comprehension				
<i>QuickSmart</i> Male	107	5.691	<0.001*	0.619
Comparison Male	20	2.405	0.144	0.394
<i>QuickSmart</i> Female	95	8.583	<0.001*	0.939
Comparison Female	23	6.387	<0.001*	0.84
<i>QuickSmart</i> Not Indicated	45	5.249	<0.001*	0.664
Comparison Not Indicated	29	3.087	0.070	0.394

In terms of Scale scores, the results indicate that male *QuickSmart* students improved more than female *QuickSmart* students in vocabulary and female students improved more in comprehension. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.084$ for vocabulary and 0.095 for comprehension).

Table 17 reports the same information as Table 15 but does so for the scores of Indigenous students included in the *QuickSmart* program.

Table 17: PAT-V and PAT-C results – Indigenous (Scale scores) 2023

Group	Students with paired data	Average Gain score	Significance	Effect size
Vocabulary				
Indigenous <i>QuickSmart</i>	9	5.344	0.031	0.791
All Comparison	23	0.266	0.844	0.034
Comprehension				
Indigenous <i>QuickSmart</i>	14	9.286	0.001*	1.099
All Comparison	72	3.951	<0.001*	0.532

With respect to Vocabulary, the Indigenous students' results show a slightly smaller improvement than the overall *QuickSmart* group and in excess of that achieved by the comparison group. The Indigenous students' Comprehension results show greater improvement than the overall *QuickSmart* or comparison group.

The following figure shows that the *QuickSmart* students consistently achieve the gains in PAT across the middle school years targeted by the program, that is Year 4 through to Year 8. The tables of figures for these graphs are available in the Appendices. Other years were not included due to being outside the range targeted by the program.

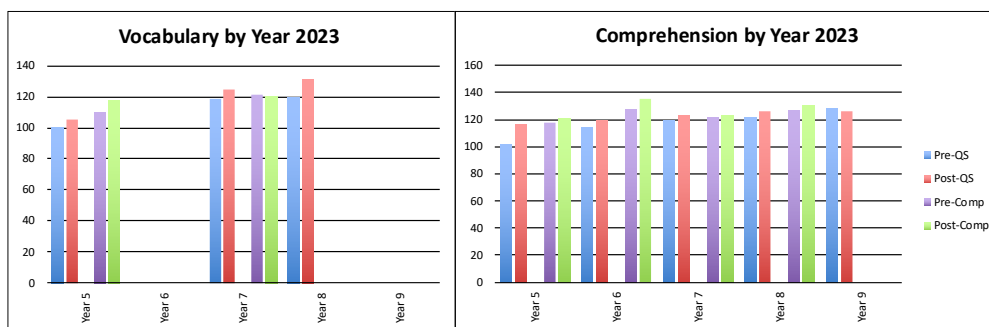


Figure 2: PAT-V and PAT-C by Year

The following table shows the percentage of *QuickSmart* students that achieved a gain on the PAT results for either Vocabulary or Comprehension.

Table 18: Percentage students with PAT Gain

Student Type	N with gain	N with PAT	Percentage with Gain
Vocabulary			
<i>QuickSmart</i>	139	178	78.1
Comparison	8	23	34.8
Comprehension			
<i>QuickSmart</i>	196	247	79.4
Comparison	52	72	72.2

For both Vocabulary and Comprehension these results show that in the *QuickSmart* group, a greater percentage of students achieved gain in PAT than in the comparison group of their average-achieving peers.

6 Conclusion to Report

The support provided by Schools and Clusters of Schools has been critical in making more positive the hopes and aspirations of students participating in the *QuickSmart* program. This report has focused on both the quantitative and qualitative aspects of the program. In all quantitative analyses, the data report a narrowing of the achievement gap between *QuickSmart* students and their average-performing comparison group peers. Impressive effect sizes have been reported with highly significant gains by individual students, some of whom could not complete the full suite of pre-test assessments.

Additionally, substantial qualitative data (reported in school presentations during professional workshops 2 and 3) indicate that *QuickSmart* students gained a new confidence in Literacy learning. Many stories within the corpus of qualitative data document improvements for *QuickSmart* students not only in relation to their performance in class, but also about students' attitudes to their attendance and levels of academic confidence both inside and outside the classroom.

The data collected to date from many thousands of *QuickSmart* students indicate that the narrowing of the achievement gap between *QuickSmart* and comparison students is more than possible, and results record low-achieving students proceeding with their studies more successfully by learning to 'trust their heads' in the same ways that effective learners do. Importantly, previous *QuickSmart* studies (references at <https://simerr.une.edu.au/quicksmart/publications/>) demonstrate that *QuickSmart* students can maintain the gains made during the program for years after they completed the program, especially if ideas are reinforced in the classroom. Analyses have consistently identified impressive statistically significant end-of-program and longitudinal gains in terms of probability measures and effect sizes that mirror qualitative improvements reported by teachers, paraprofessionals, parents and *QuickSmart* students.

If you have any questions concerning this report or the *QuickSmart* Program, please contact us at the SiMERR National Centre at UNE on (02) 6773 5067 or by email on QuickSmart@une.edu.au.



Professor John Pegg

7 APPENDIX A: Independent Assessment Results

7.1 PAT Results – by Demographic (Scale Scores) 2023

Demographic	Pre-Intervention			Post-Intervention		Gain	p	Effect size
	N	Mean	SD	Mean	SD			
All Schools Vocabulary – <i>QuickSmart</i> Group	179	118.215	8.748	124.627	9.772	6.412	<0.001*	0.691
All Schools Vocabulary – Comparison Group	23	119.717	8.336	119.983	7.304	0.266	0.844	0.034
All Schools Comprehension – <i>QuickSmart</i> Group	247	121.581	8.535	128.304	9.598	6.723	<0.001*	0.74
All Schools Comprehension – Comparison Group	72	125.096	7.56	129.047	7.279	3.951	<0.001*	0.532
Vocabulary – <i>QuickSmart</i> Indigenous	9	118.767	7.726	124.111	5.629	5.344	0.031	0.791
Comprehension – <i>QuickSmart</i> Indigenous	14	118.764	9.811	128.05	6.824	9.286	0.001	1.099
Vocabulary – <i>QuickSmart</i> Male	111	118.413	8.702	125.727	9.381	7.314	<0.001*	0.808
Vocabulary – Comparison Male	9	123.244	7.431	122.989	8.007	-0.255		No Improvement
Vocabulary – <i>QuickSmart</i> Female	68	117.891	8.878	122.832	10.196	4.941	<0.001*	0.517
Vocabulary – Comparison Female	14	117.45	8.335	118.05	6.368	0.6	0.751	0.081
Vocabulary – <i>QuickSmart</i> Not indicated	0							
Vocabulary – Comparison Not indicated	0							
Comprehension – <i>QuickSmart</i> Male	107	122.705	8.897	128.396	9.473	5.691	<0.001*	0.619
Comprehension – Comparison Male	20	128.055	5.801	130.46	6.383	2.405	0.144	0.394
Comprehension – <i>QuickSmart</i> Female	95	121.521	8.775	130.104	9.492	8.583	<0.001*	0.939
Comprehension – Comparison Female	23	123.93	8.724	130.317	6.284	6.387	<0.001*	0.84
Comprehension – <i>QuickSmart</i> Not indicated	45	119.033	6.511	124.282	9.098	5.249	<0.001*	0.664
Comprehension – Comparison Not indicated	29	123.979	7.324	127.066	8.298	3.087	0.070	0.394

Note: only students who did both ‘pre’ and ‘post’ test are included in the table.

7.2 PAT Results – by State (Scale Scores) 2023

Demographic	Pre-Intervention			Post-Intervention		Gain	p	Effect size
	N	Mean	SD	Mean	SD			
NSW Vocabulary - <i>QuickSmart</i> Group	46	118.75	10.869	125.98	12.577	7.23	<0.001*	0.615
NSW Vocabulary - Comparison Group	4	112.85	10.653	116.95	10.339	4.1	0.429	0.391
NSW Comprehension - <i>QuickSmart</i> Group	94	121.605	9.792	129.512	10.046	7.907	<0.001*	0.797
NSW Comprehension - Comparison Group	9	123.233	9.382	125.456	6.813	2.223	0.432	0.271
Qld Vocabulary - <i>QuickSmart</i> Group	16	115.156	7.141	131.806	11.781	16.65	<0.001*	1.709
Qld Vocabulary - Comparison Group	7	117.943	6.764	117.857	5.57		0.956	No Improvement
Qld Comprehension - <i>QuickSmart</i> Group	71	121.896	7.966	125.738	7.558	3.842	<0.001*	0.495
Qld Comprehension - Comparison Group	33	126.118	7.607	131.479	6.319	5.361	<0.001*	0.767
Vic Vocabulary - <i>QuickSmart</i> Group	117	118.422	7.972	123.114	7.555	4.692	<0.001*	0.604
Vic Vocabulary - Comparison Group	12	123.042	7.201	122.233	6.991		0.683	No Improvement
Vic Comprehension - <i>QuickSmart</i> Group	82	121.279	7.494	129.14	10.312	7.861	<0.001*	0.872
Vic Comprehension - Comparison Group	30	124.53	7.015	127.45	7.712	2.92	0.091	0.396

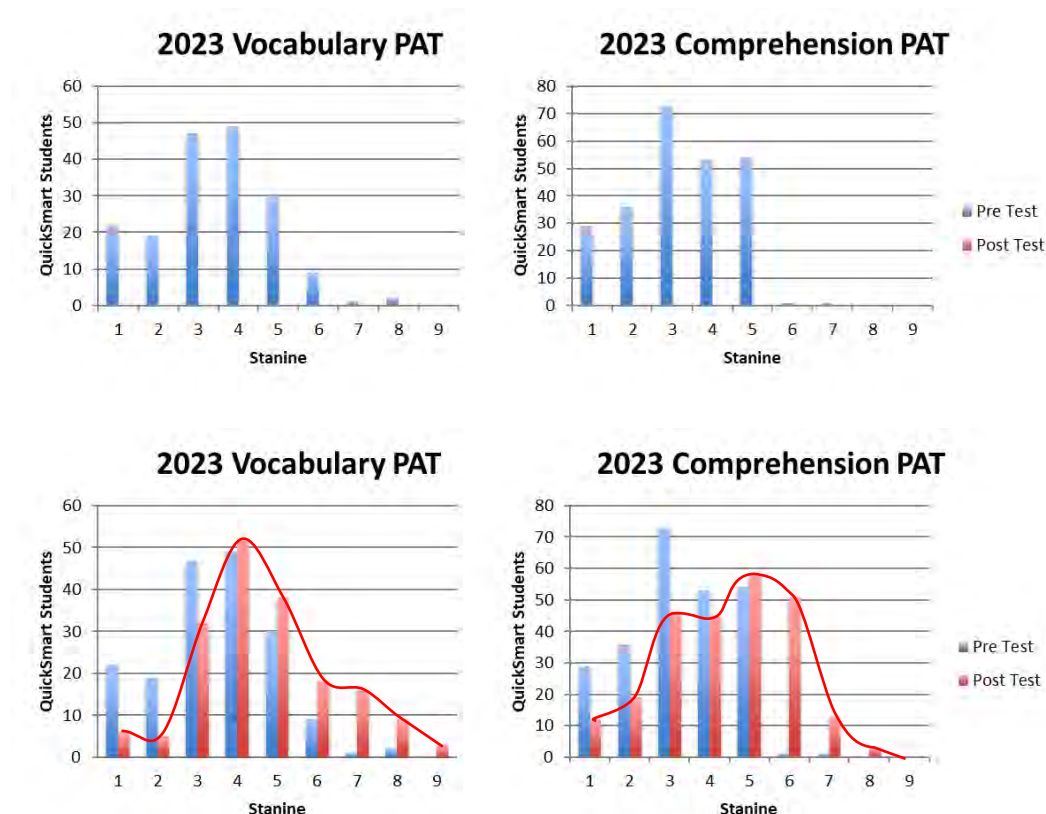
Note: only students who did both 'pre' and 'post' test are included in the table. Groups with less than 5 students are excluded.

7.3 PAT Results – by Year (Scale Scores) 2023

Year	Pre-Intervention			Post-Intervention				
	N	Mean	SD	Mean	SD	Gain	p	Effect size
Year 5 Vocabulary – <i>QuickSmart</i> Group	5	100.28	11.216	105.46	8.388	5.18	0.046	0.523
Year 5 Vocabulary – Comparison Group	3	110.067	11.124	117.233	12.644	7.166	0.263	0.602
Year 5 Comprehension – <i>QuickSmart</i> Group	10	102.05	10.801	116.3	6.886	14.25	<0.001*	1.573
Year 5 Comprehension – Comparison Group	4	117.95	12.244	120.9	4.829	2.95	0.553	0.317
Year 6 Vocabulary – <i>QuickSmart</i> Group	0							
Year 6 Vocabulary – Comparison Group	0							
Year 6 Comprehension – <i>QuickSmart</i> Group	17	114.135	5.88	119.524	9.515	5.389	0.013	0.681
Year 6 Comprehension – Comparison Group	3	128.033	2.013	135.167	1.674	7.134	0.038	3.853
Year 7 Vocabulary – <i>QuickSmart</i> Group	168	118.787	8.194	125.063	9.251	6.276	<0.001*	0.718
Year 7 Vocabulary – Comparison Group	20	121.165	7.108	120.395	6.601	-0.77		No Improvement
Year 7 Comprehension – <i>QuickSmart</i> Group	165	123.135	7.151	130.64	9.175	7.505	<0.001*	0.912
Year 7 Comprehension – Comparison Group	40	124.032	6.862	128.2	7.938	4.168	0.006	0.562
Year 8 Vocabulary – <i>QuickSmart</i> Group	5	119.68	3.094	131.62	6.321	11.94	0.021	2.399
Year 8 Vocabulary – Comparison Group	0							
Year 8 Comprehension – <i>QuickSmart</i> Group	48	121.94	7.004	126.142	7.96	4.202	<0.001*	0.56
Year 8 Comprehension – Comparison Group	23	127.174	7.629	130.678	5.628	3.504	0.018	0.523
Year 9 Vocabulary – <i>QuickSmart</i> Group	0							
Year 9 Vocabulary – Comparison Group	0							
Year 9 Comprehension – <i>QuickSmart</i> Group	7	128.471	4.699	126.529	4.157	-1.942		No Improvement
Year 9 Comprehension – Comparison Group	2	132.35	1.909	134.35	2.758	2.0	0.186	0.843

Other years were not included due to being outside the range targeted by the program or insufficient numbers.

7.4 National Literacy PAT Improvement of QuickSmart Students



The Australian Council for Educational Research (ACER) PAT tests use a framework for describing results against national Australian norms. This technique applies stanine scores that divide the population using a scale of 1 to 9.

A stanine score of:

- 1 represents performance below the bottom 4% of the population,
- 2 represents performance in the lower 5-11% of the population
- 3 represents performance in the lower 12-23% of the population
- 4 represents performance in the lower 24-40% of the population
- 5 represents performance in middle 41-60% of the population
- 6 represents performance in the higher 61-77% of the population
- 7 represents performance in the higher 78-88% of the population
- 8 represents performance in the higher 89-96% of the population
- 9 represents performance above the top 4% of the population.

It is particularly difficult to move students out of the lower stanine bands. The results above show that *QuickSmart* has been quite successful in moving students into higher bands, as measured by the PAT tests.

7.5 PAT Vocabulary Results by Percentile

Demographic	Mean Percentile			
	N	Pre	Post	Gain
All QuickSmart	179	26.68	43.42	16.74
All Comparison	23	32.96	32.35	-0.61
Indigenous QuickSmart	9	27.44	41.56	14.12
QuickSmart Female	68	25.63	38.34	12.71
Comparison Female	14	26.36	26.43	0.07
QuickSmart Male	111	27.32	46.53	19.21
Comparison Male	9	43.22	41.56	-1.66
Year				
QuickSmart Year 5	5	11.80	15.80	4.00
Comparison Year 5	3	30.67	46.00	15.33
QuickSmart Year 7	168	27.61	44.08	16.47
Comparison Year 7	20	33.30	30.30	-3.00
QuickSmart Year 8	5	15.60	51.40	35.80
Lessons attended				
<=20	2	46.00	48.00	2.00
21-40	48	31.92	40.60	8.68
41-60	68	27.47	43.10	15.63
61-80	57	22.05	47.88	25.83
80+	4	6.75	16.75	10.00

7.6 PAT Comprehension Results by Percentile

Demographic	Mean Percentile			
	N	Pre	Post	Gain
All QuickSmart	247	22.83	40.04	17.21
All Comparison	72	29.68	40.43	10.75
Indigenous QuickSmart	14	19.86	39.43	19.57
QuickSmart Female	95	24.13	46.23	22.10
Comparison Female	23	27.35	42.61	15.26
QuickSmart Male	107	25.75	39.95	14.20
Comparison Male	20	38.75	47.35	8.60
QuickSmart Not Identified	45	13.16	27.16	14.00
Comparison Not Identified	29	25.28	33.93	8.65
Year				
QuickSmart Year 5	10	7.10	27.30	20.20
Comparison Year 5	4	35.00	39.00	4.00
QuickSmart Year 6	17	15.53	29.00	13.47
Comparison Year 6	3	47.00	69.67	22.67
QuickSmart Year 7	165	26.72	46.99	20.27
Comparison Year 7	40	28.60	40.53	11.93
QuickSmart Year 8	48	15.35	25.92	10.57
Comparison Year 8	23	28.13	36.78	8.65
QuickSmart Year 9	7	22.71	17.86	-4.85
Comparison Year 9	2	32.50	39.50	7.00
Lessons attended				
<=20	6	13.83	22.17	8.34
21-40	38	25.50	43.79	18.29
41-60	105	22.66	39.15	16.49
61-80	91	23.10	41.82	18.72
80+	5	8.6	31.6	23.00