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Annual Literacy Program Report 2015

**The SiMERR National Research Centre
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quicksmart

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1 *QuickSmart* Executive Summary in 2015

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 aware citizenship. Those who exhibit consistent weaknesses in basic skills, such as the recall of number facts, or who experience difficulty with reading and comprehension are particularly vulnerable. These students are usually caught in a cycle of continued failure, as it is particularly difficult to bring about sustainable change within the usual classroom environments for students who by Year 4 are persistently at or below national benchmarks.

Three issues confront schools in Australia 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 their problems. 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 an underutilised, poorly supported, and seldom recognised resource in school education. With appropriate training these adults are highly motivated, and offer cost-effective, long-term sustainable ways to close the achievement gap for low-achieving students. In remote and rural areas, trained Indigenous teaching assistants (as *QuickSmart* Instructors) are a resource able to enrich their whole community.
3. Educational support programs need to be sustainable in the short- and long-term without large drains on the public purse. Sustainability means cost-efficient, clear exit criteria, proven longitudinal results, documented ongoing benefits for students and instructors, and replicable (including quality assurance) across all regions of Australia.

The analyses presented in this report provide information about students' performance in the *QuickSmart* Numeracy program. In particular, the focus here is on the Cognitive Aptitude Assessment System, Australian version (OZCAAS) and on standardised test measures, specifically the Progressive Achievement Tests in Vocabulary (V) and Comprehension (C) (ACER, 2005). 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 the participating Indigenous students.

In 2015, the *QuickSmart* team at the University of New England received data from 1495 students who participated in *QuickSmart* Literacy lessons and 367 average-achieving comparison peers. These students were drawn from schools from 18 regions around Australia. Further data were also submitted for independent analysis to the Northern Territory (NT) Department of Education and Training by NT schools.

In terms of the OZCAAS (a random letter and word computer generated testing approach that measures the time and the accuracy of basic literacy) the results for Vocabulary and Comprehension indicate a strong to substantial improvement for the *QuickSmart* students in terms of accuracy and speed. The diagrammatic evidence illustrate that the *QuickSmart* students narrowed the achievement gap by improving to such an extent that there was either no substantial difference between them and the comparison students or they had reached a slightly better level of performance than their comparison group peers.

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

Some small differences between male and female students were observed. However, except in one of the twelve analyses undertaken the statistical differences were not significant. As a result, these data do not warrant further investigation.

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

Another mark of the success of *QuickSmart* is the results of those students who did not succeed in completing the pre-test. In such cases Instructors were advised not to continue collecting data, as doing so would have confronted these students dramatically with their weaknesses at the beginning of the program. These students did manage to complete all OZCAAS assessments at the end of the program.

The results are impressive given that these students did not have the skills or confidence to complete the OZCAAS pre-tests initially. In Essential Words and Level 1 Words, the average response rates at the end of the program were below two seconds, with accuracy results above 88%. In Level 2 Words, the average response rates were close to 2 seconds, with average accuracy above 79%.

In Comprehension Level 1, the average response rates were almost within the goal range, with average accuracy above 87%. Even though some of these students may not have progressed to Level 3 Words during *QuickSmart* lessons, their post-test results are encouraging with response speeds below 3.8 seconds and accuracy over 60% at post-test. It is likely that part of this improvement may be due to the fact that students':

- increased their ability to benefit from classroom instruction; and
- improved their levels of confidence may have led to a 'have a go attitude' that was not present at the beginning of the *QuickSmart* program.

In the case of the ACER PAT-V and PAT-C tests, Norm Tables (2008) were used to convert raw scores from various forms of the PAT to consistent Scale scores, which were used for all subsequent calculations. Two 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 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.

In terms of Scale scores derived from the PAT-V and PAT-C tests, the results indicate that male *QuickSmart* students improved slightly more in vocabulary compared to female *QuickSmart* students. Although this finding is statistically significant ($p = .002$), it appears to be an artefact of large sample sizes which tend to increase the power of the test to the point when even small differences become statistically significant. This was confirmed by a weak effect size (Cohen's $d = 0.157$) for gender differences in vocabulary. The small effect size indicates that the statistical finding is not meaningful for practical purposes.

In the case of Indigenous students who participated in *QuickSmart*, the results show strong improvement in both vocabulary and comprehension. These students were able to report a rate of growth higher than the total cohort of *QuickSmart* students and in excess of that achieved by the comparison group.

In overview, this report focuses on the quantitative aspects of the program. In all 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 as well as highly significant gains on the part of individual students who, in some cases, 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 the area of mathematics. Many stories within the corpus of qualitative data document improvements for *QuickSmart* students not only in relation to their performance in class, but also with regard to students' attitudes to school, their attendance rates and levels of academic confidence both inside and outside the classroom.

The data collected to date from tens of thousands of *QuickSmart* students indicate that the narrowing of the achievement gap between *QuickSmart* and comparison students results in 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 demonstrate that *QuickSmart* students can maintain the gains made during the program for years after they completed the program. Analyses have consistently identified 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.

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. These targeted students experience significant and sustained difficulties in basic mathematics and/or literacy, and have a profile of low progress despite attempts to overcome their learning problems. Many such students have not drawn 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 professional learning and support for working in a small-class instructional setting with two students, using a specially constructed teaching program supported by extensive material and computer-based resources.

2.2 *QuickSmart* Program Description

The *QuickSmart* Numeracy and Literacy interventions were developed 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.

The intervention is called *QuickSmart* to encourage students to become *quick* in their response speed and *smart* in their understanding and the strategic use of mental and other resources. In *QuickSmart*, the aim 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 are able to engage meaningfully with more demanding cognitive activities. In these interventions, automaticity is fostered; time, accuracy and understanding are incorporated as key dimensions of learning; and an emphasis is placed on ensuring maximum student on-task time. *QuickSmart* lessons develop learners' abilities to monitor their academic learning and set realistic goals for themselves.

Comprehension skills are emphasised in the *QuickSmart* Literacy program. The three-lesson cycle shown in Figure 1 indicates how this program focuses on each individual piece of text.

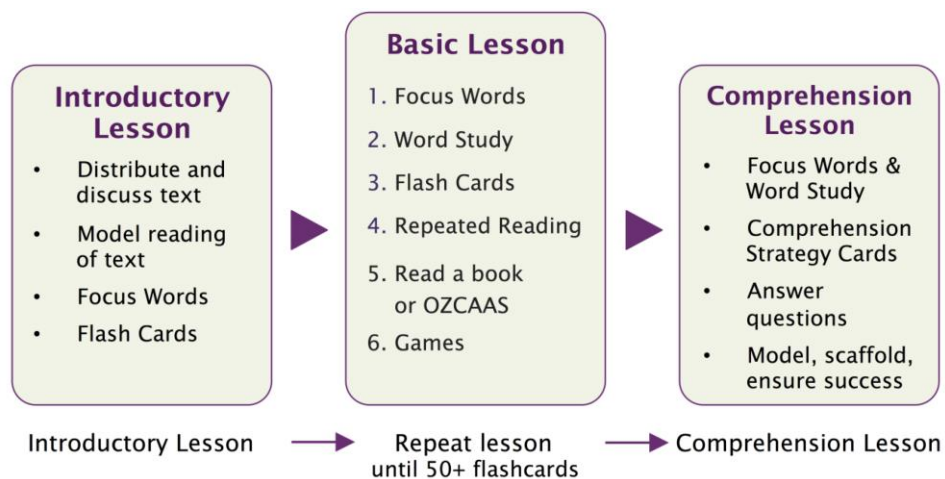


Figure 1: *QuickSmart* Literacy lesson structures

During the first lesson, the meaning of the text is emphasised and discussed. The structure of the second *QuickSmart* lesson type is repeated between three and six times to provide support and practice in basic literacy skills. Finally, the third type of lesson is used to ensure students can convey their comprehension of the passage.

3 *QuickSmart* Tests – 2015

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 Cognitive Aptitude Assessment System, Australian version (OZCAAS);
- (ii) on standardised test measures, specifically the Progressive Achievement Tests in Vocabulary and Comprehension (ACER, 2008); and
- (iii) in terms of gender and participating Indigenous students.

The first set of analyses examine data from speed and accuracy OZCAAS measures. These are related to vocabulary and comprehension and 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 measured students' speed and accuracy both before *QuickSmart* began and at the end of the program. The tests were:

- 1. Essential Words;
- 2. Level 1 Words;
- 3. Comprehension Level 1;
- 4. Level 2 Words;
- 5. Comprehension Level 2; and
- 6. Level 3 Words.

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 target of *QuickSmart* instruction.

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

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

3.2 Background to Test Interpretation

For all tests in this study (OZCAAS, and PAT-V and PAT-C) the comparison group represents average-achieving students selected from the same class as *QuickSmart* students. The comparison students did the pre-intervention and post-intervention tests but did not receive any *QuickSmart* small-class instruction. It is important to note that the comparison students do not represent a 'true' control group because they do not share the same achievement starting points with the *QuickSmart* students. The former were average-achieving students, the latter were low-achieving students. This point 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.

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 an even greater margin of improvement relative to that group of 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 are sharing *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 years. While this attests to the impact that *QuickSmart* is having in schools, it does not allow a straightforward interpretation of 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 in order 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.) This 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 that the result was obtained by chance.

4 Results on the OZCAAS Assessments

4.1 Introduction

In 2015, the *QuickSmart* team at the University of New England received data from 1495 students who participated in *QuickSmart* Literacy lessons and 367 average-achieving comparison peers. These students were drawn from schools from 18 regions around Australia. Further data were also submitted for independent analysis to the Northern Territory (NT) Department of Education and Training by NT schools.

To assist with interpretation of these results, Level 3 Words and Comprehension 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 at pre-test and this does not leave much room for improvement. The OZCAAS results recorded for average-achieving comparison students should also be interpreted with the knowledge that many of these students’ results are constrained by a ceiling effect.

The results of our analyses of data related to OZCAAS 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.

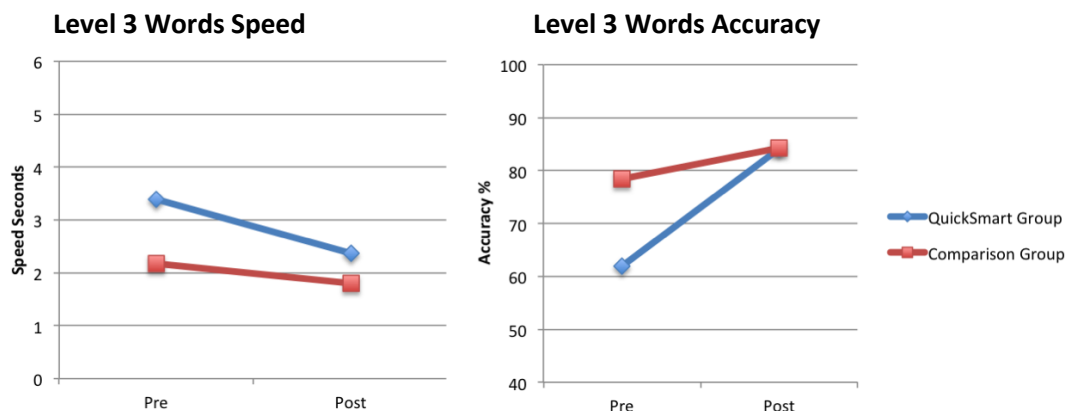
4.2 Combined OZCAAS Analysis

Table 1 summarises the data submitted for OZCAAS Level 3 Words.

4.2.1 Level 3 Words

Table 1: OZCAAS Level 3 Words results – all students 2015

Level 3 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Speed (secs) QS	1181	3.396	2.413	2.361	1.956	-1.035	<0.001*	0.471
Speed (secs) Comp	277	2.169	1.548	1.8	1.09	-0.369	<0.001*	0.275
Accuracy (%) QS	1181	61.909	24.901	84.198	19.899	22.289	<0.001*	0.989
Accuracy (%) Comp	277	78.405	19.34	84.218	18.456	5.813	<0.001*	0.308



On the Level 3 Words test, there were paired data for 1181 *QuickSmart* students and 277 comparison students. The desired criterion for response speed on the OZCAAS 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 1.035 seconds. (Note: The negative number in

the table means that the post-test time is lower than the pre-test time which is the desired pattern of improvement). The effect size for this result is 0.471, which indicates strong improvement.

Effect size statistics can be understood based on the work of Hattie (Hattie, J. 2009. *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement*. London: Routledge) 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 three years' growth.

In terms of accuracy, the *QuickSmart* students' average scores have improved by over 22 percentage points, which is a very strong result. The effect size of 0.989, indicates a substantial improvement for the *QuickSmart* group.

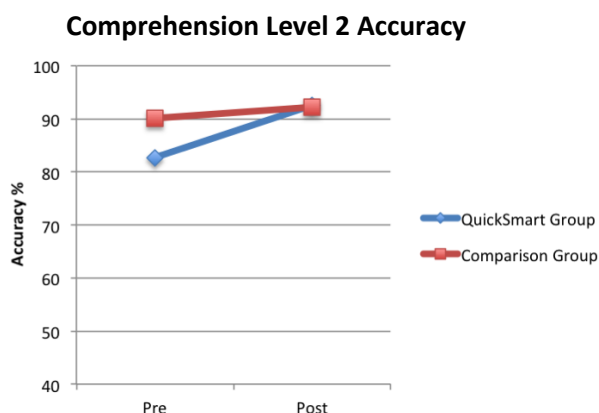
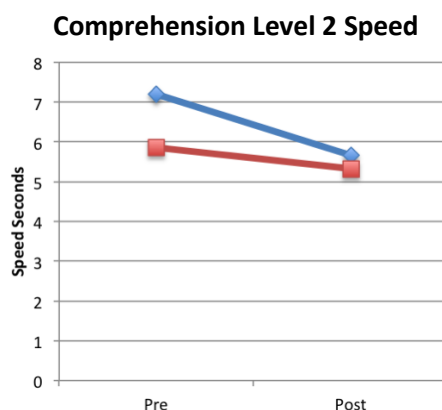
In summary, Table 1 shows that when compared to the scores of the comparison students, *QuickSmart* students' scores indicate greater improvement in terms of speed and accuracy with Level 3 Words. The diagrams illustrate the narrowing of the gap between the *QuickSmart* students and comparison students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

4.2.2 Comprehension Level 2

Table 2 summarises the data submitted for OZCAAS for Comprehension Level 2.

Table 2: OZCAAS Comprehension Level 2 – all students 2015

Comprehension Level 2	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Speed (secs) QS	1197	7.189	3.082	5.664	2.593	-1.525	<0.001*	0.536
Speed (secs) Comp	281	5.858	2.397	5.327	1.968	-0.531	<0.001*	0.242
Accuracy (%) QS	1197	82.74	15.497	92.529	10.697	9.789	<0.001*	0.735
Accuracy (%) Comp	281	90.134	9.623	92.267	7.865	2.133	<0.001*	0.243



On the Comprehension Level 2 test, there were paired data for 1197 *QuickSmart* students and 281 comparison students. This test required students to choose the best alternative for two words to complete a sentence. It is a test of sentence-level cloze reading skills. The desired criterion for response speed on the OZCAAS assessments for comprehension is between 3 and

4 seconds as an indication of automaticity. The decrease in time for *QuickSmart* students is 1.525 seconds, which is a strong result. The effect size for this result is 0.536, which indicates strong improvement.

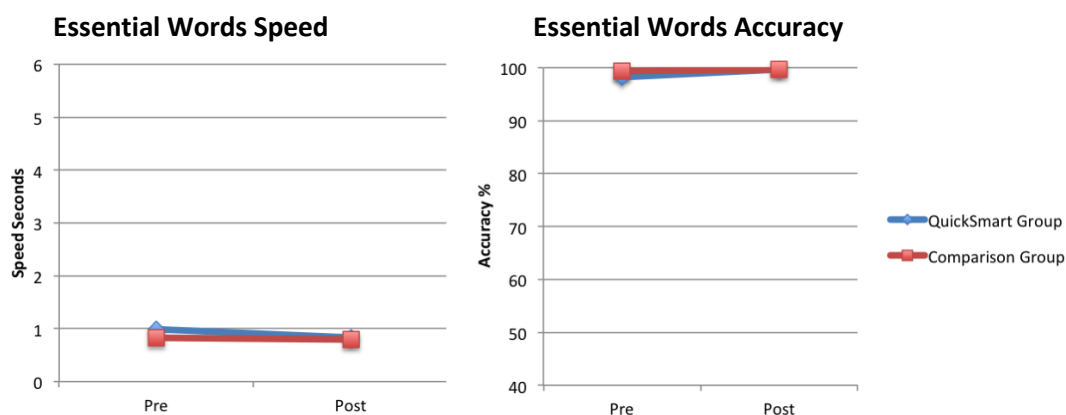
In terms of accuracy, the *QuickSmart* students' average scores have improved by nearly 10 percentage points, which is a strong result. The effect size is 0.735, which indicates very strong improvement for the *QuickSmart* group.

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

4.2.3 Essential Words

Table 3: OZCAAS Essential Words – all students 2015

Essential Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Speed (secs) QS	1237	0.996	0.478	0.831	0.393	-0.165	<0.001*	0.376
Speed (secs) Comp	261	0.823	0.239	0.789	0.234	-0.034	0.053	0.145
Accuracy (%) QS	1237	98.182	5.14	99.657	1.686	1.475	<0.001*	0.386
Accuracy (%) Comp	261	99.378	1.971	99.733	1.171	0.355	0.011	0.219

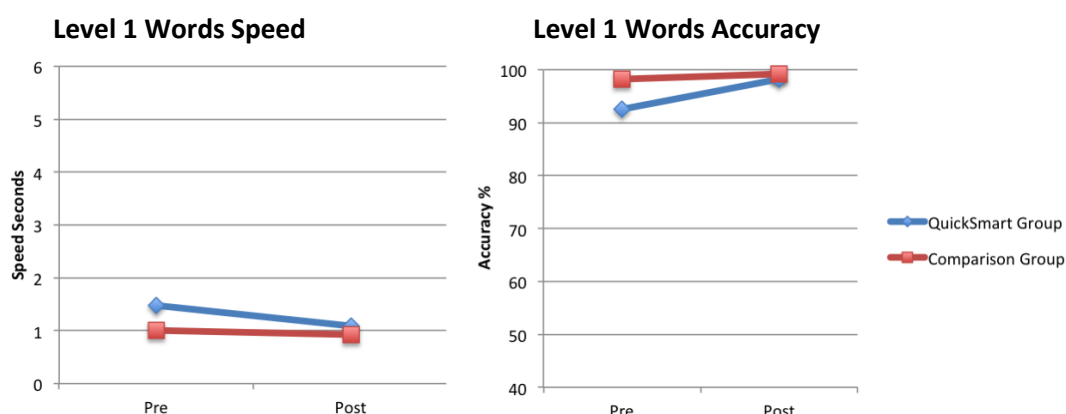


In summary, the results for Essential Words, the most commonly used words that should be known by middle school students, indicate a stronger improvement for the *QuickSmart* students than for the comparison students. However, both the speed and accuracy results show a strong ceiling effect as the results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

4.2.4 Level 1 Words

Table 4: OZCAAS Level 1 Words – all students 2015

Level 1 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Speed (secs) QS	1303	1.469	1.131	1.089	0.773	-0.38	<0.001*	0.392
Speed (secs) Comp	280	1.001	0.411	0.925	0.332	-0.077	0.003*	0.205
Accuracy (%) QS	1303	92.535	12.661	98.283	5.872	5.748	<0.001*	0.582
Accuracy (%) Comp	280	98.201	4.14	99.165	2.348	0.964	<0.001*	0.286

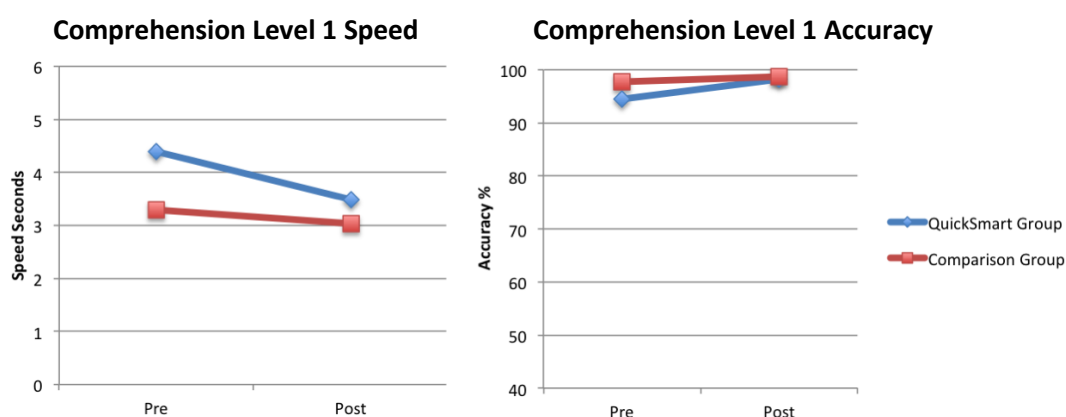


In summary, the results for Level 1 Words indicate a strong improvement for the *QuickSmart* students. The diagrams illustrate that the *QuickSmart* students improved to such an extent that there was no substantial difference between them and the comparison students. Both speed and accuracy results for the comparison group show a strong ceiling effect.

4.2.5 Comprehension Level 1

Table 5: OZCAAS Comprehension Level 1 – all students 2015

Comprehension Level 1	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Speed (secs) QS	1280	4.387	1.999	3.489	1.622	-0.897	<0.001*	0.493
Speed (secs) Comp	284	3.298	1.141	3.034	1.005	-0.264	<0.001*	0.246
Accuracy (%) QS	1280	94.448	10.153	98.207	4.838	3.759	<0.001*	0.473
Accuracy (%) Comp	284	97.684	4.269	98.646	3.117	0.962	0.001*	0.257

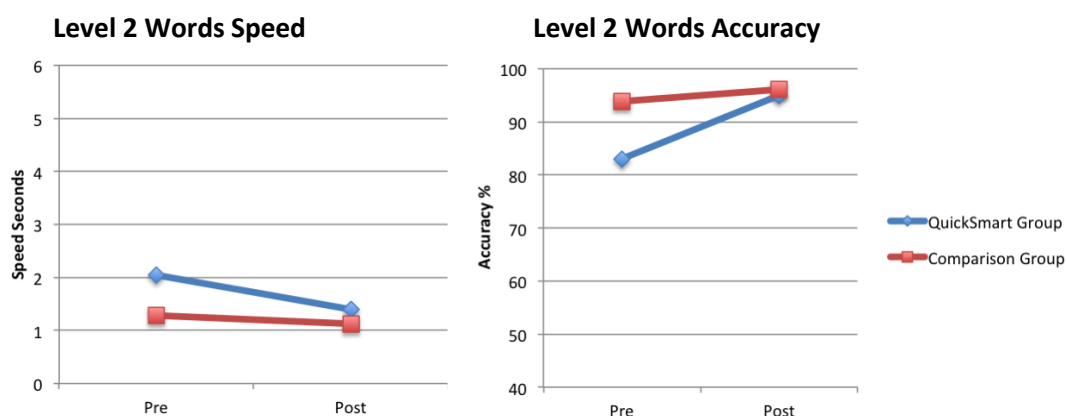


In summary, the results for Comprehension Level 1 indicate a strong improvement for the *QuickSmart* students. The diagrams illustrate that the *QuickSmart* students narrowed the gap to the comparison students in speed. In accuracy, they improved to such an extent that there was no substantial difference between them and the comparison students. The accuracy results for the comparison group show a strong ceiling effect.

4.2.6 Level 2 Words

Table 6: OZCAAS Level 2 Words – all students 2015

Level 2 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Speed (secs) QS	1277	2.044	1.566	1.395	1.067	-0.649	<0.001*	0.484
Speed (secs) Comp	283	1.282	0.731	1.125	0.457	-0.157	<0.001*	0.257
Accuracy (%) QS	1277	83.056	18.387	94.936	10.334	11.88	<0.001*	0.797
Accuracy (%) Comp	283	93.873	9.147	96.077	6.778	2.204	<0.001*	0.274



The results for Level 2 Words indicate a strong improvement for the *QuickSmart* students. The diagrams illustrate that the *QuickSmart* students narrowed the gap to the comparison students in speed. In accuracy, they improved to such an extent that there was no substantial difference between them and the comparison students.

4.3 OZCAAS By Demographics

4.3.1 Essential Words by Gender

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

Table 7: OZCAAS Essential Words results – all students by gender 2015

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Male QS (speed)	682	1.022	0.515	0.846	0.416	-0.177	<0.001*	0.377
Male COMP (speed)	142	0.827	0.238	0.792	0.245	-0.034	0.189	0.142
Female QS (speed)	555	0.963	0.426	0.814	0.361	-0.15	<0.001*	0.379
Female COMP (speed)	119	0.819	0.241	0.785	0.222	-0.034	0.141	0.148
Male QS (accuracy)	682	97.839	5.612	99.505	2.07	1.666	<0.001*	0.394
Male COMP (accuracy)	142	99.224	2.312	99.66	1.313	0.436	0.048	0.232
Female QS (accuracy)	555	98.604	4.46	99.845	1.006	1.241	<0.001*	0.384
Female COMP (accuracy)	119	99.562	1.453	99.819	0.973	0.257	0.094	0.208

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

4.3.2 Level 1 Words by Gender

Table 8: OZCAAS Level 1 Words results – all students by gender 2015

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Male QS (speed)	722	1.536	1.26	1.113	0.743	-0.422	<0.001*	0.408
Male COMP (speed)	155	1.002	0.412	0.918	0.307	-0.083	0.009*	0.23
Female QS (speed)	581	1.386	0.942	1.059	0.809	-0.327	<0.001*	0.373
Female COMP (speed)	125	1.001	0.41	0.933	0.362	-0.068	0.104	0.176
Male QS (accuracy)	722	91.673	13.642	97.742	7.095	6.069	<0.001*	0.558
Male COMP (accuracy)	155	98.026	4.556	99.181	2.32	1.155	0.002*	0.319
Female QS (accuracy)	581	93.606	11.244	98.955	3.742	5.349	<0.001*	0.638
Female COMP (accuracy)	125	98.418	3.565	99.146	2.391	0.728	0.012	0.24

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

4.3.3 Comprehension Level 1 by Gender

Table 9: OZCAAS Comprehension Level 1 results – all students by gender 2015

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Male QS (speed)	704	4.56	2.157	3.604	1.745	-0.956	<0.001*	0.487
Male COMP (speed)	158	3.419	1.231	3.103	1.102	-0.316	<0.001*	0.27
Female QS (speed)	576	4.175	1.765	3.348	1.447	-0.827	<0.001*	0.512
Female COMP (speed)	126	3.146	1.002	2.946	0.864	-0.2	0.016	0.213
Male QS (accuracy)	704	93.989	10.041	97.869	5.472	3.88	<0.001*	0.48
Male COMP (accuracy)	158	97.57	4.138	98.456	3.397	0.886	0.026	0.234
Female QS (accuracy)	576	95.009	10.268	98.619	3.89	3.61	<0.001*	0.465
Female COMP (accuracy)	126	97.826	4.44	98.883	2.719	1.057	0.012	0.287

In summary, the results of *QuickSmart* students show that in both speed and accuracy the males have improved slightly more than the females. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level for accuracy ($p = 0.345$). However, they are statistically significant for speed ($p = 0.004$).

This finding is possibly an artefact of large sample sizes, which tend to increase the power of the test to the point when even small differences become statistically significant. This was confirmed by a weak effect size (Cohen's $d = 0.078$) for gender differences in speed. The small effect size indicates that the statistical finding is not meaningful for practical purposes.

4.3.4 Level 2 Words by Gender

Table 10: OZCAAS Level 2 Words results – all students by gender 2015

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Male QS (speed)	706	2.045	1.593	1.403	1.112	-0.642	<0.001*	0.467
Male COMP (speed)	157	1.234	0.704	1.109	0.473	-0.125	0.013	0.208
Female QS (speed)	571	2.042	1.533	1.385	1.009	-0.658	<0.001*	0.507
Female COMP (speed)	126	1.341	0.763	1.144	0.438	-0.196	<0.001*	0.315
Male QS (accuracy)	706	82.661	18.902	94.392	11.018	11.731	<0.001*	0.758
Male COMP (accuracy)	157	94.108	8.604	96.172	6.562	2.064	<0.001*	0.27
Female QS (accuracy)	571	83.545	17.732	95.608	9.386	12.063	<0.001*	0.85
Female COMP (accuracy)	126	93.582	9.809	95.958	7.062	2.376	0.002*	0.278

In summary, the results of *QuickSmart* students show that in both speed and accuracy the females have improved marginally more than the males. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.671$ for speed and 0.743 for accuracy).

4.3.5 Comprehension Level 2 by Gender

Table 11: OZCAAS Comprehension Level 2 results – all students by gender 2015

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Male QS (speed)	658	7.271	3.081	5.759	2.68	-1.512	<0.001*	0.524
Male COMP (speed)	157	5.952	2.61	5.329	2.05	-0.623	<0.001*	0.265
Female QS (speed)	539	7.089	3.082	5.547	2.479	-1.541	<0.001*	0.551
Female COMP (speed)	124	5.739	2.1	5.325	1.868	-0.414	0.007*	0.208
Male QS (accuracy)	658	82.361	15.343	92.19	10.632	9.829	<0.001*	0.745
Male COMP (accuracy)	157	89.794	10.019	91.664	8.273	1.87	0.033	0.204
Female QS (accuracy)	539	83.202	15.685	92.944	10.772	9.742	<0.001*	0.724
Female COMP (accuracy)	124	90.565	9.119	93.03	7.278	2.465	0.002*	0.299

In summary, the results of *QuickSmart* students show that in speed the females have improved slightly more than the males. For accuracy the males have improved slightly more than the females. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.399$ for speed and 0.681 for accuracy).

4.3.6 Level 3 Words by Gender

Table 12: OZCAAS Level 3 Words results – all students by gender 2015

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Male QS (speed)	649	3.303	2.422	2.269	1.838	-1.035	<0.001*	0.481
Male COMP (speed)	154	2.066	1.63	1.723	1.113	-0.343	0.001*	0.246
Female QS (speed)	532	3.509	2.4	2.473	2.087	-1.036	<0.001*	0.461
Female COMP (speed)	123	2.298	1.436	1.897	1.057	-0.401	<0.001*	0.318
Male QS (accuracy)	649	61.319	25.054	83.373	20.36	22.054	<0.001*	0.966
Male COMP (accuracy)	154	79.691	18.652	84.558	19.589	4.867	<0.001*	0.254
Female QS (accuracy)	532	62.629	24.717	85.203	19.294	22.574	<0.001*	1.018
Female COMP (accuracy)	123	76.794	20.13	83.792	17.0	6.998	<0.001*	0.376

In summary, the results of *QuickSmart* students show that in both speed and accuracy the females have improved marginally more than the males. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.263$ for speed and 0.166 for accuracy).

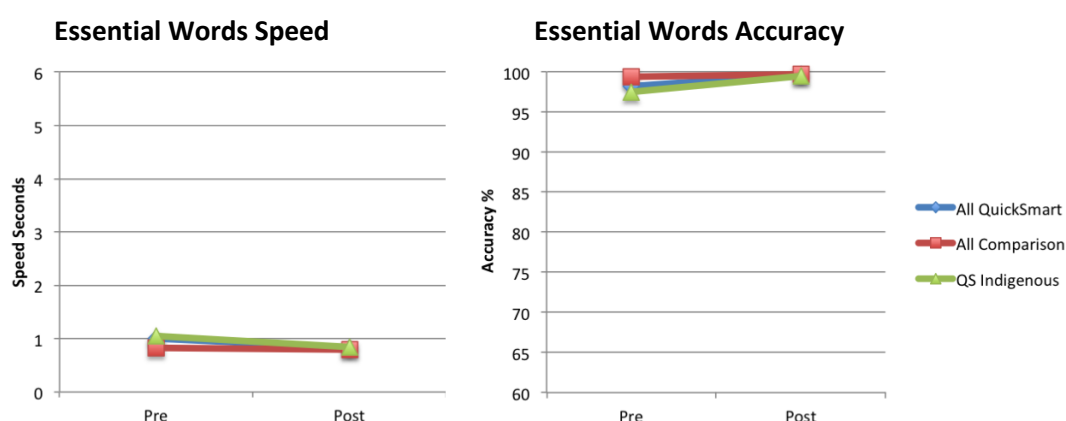
4.3.7 Indigenous Students

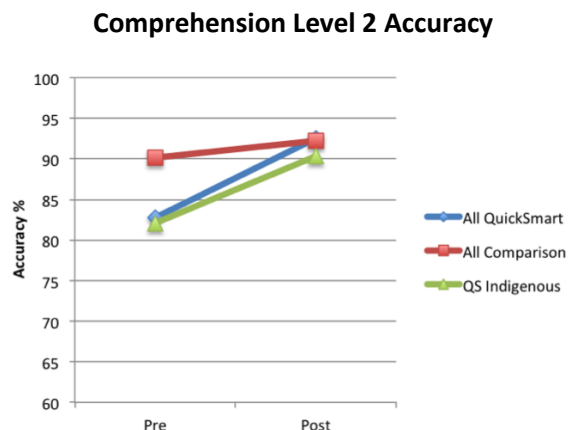
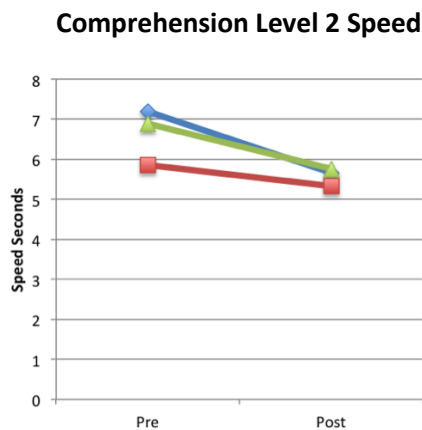
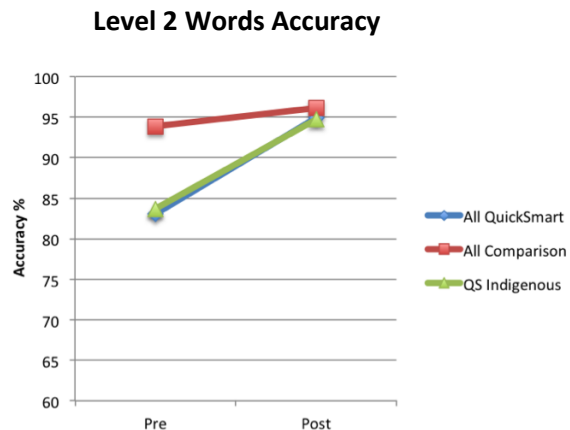
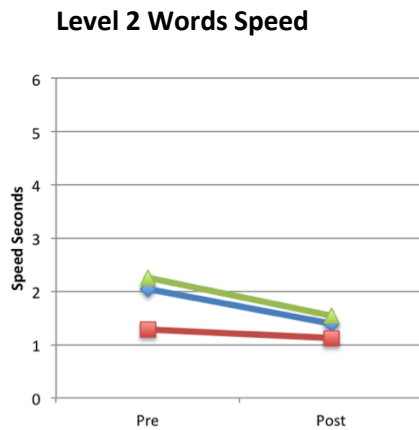
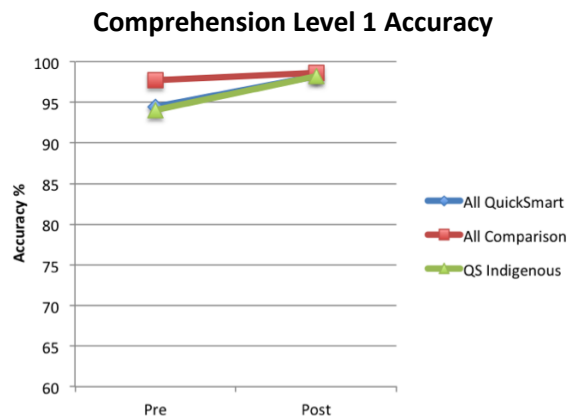
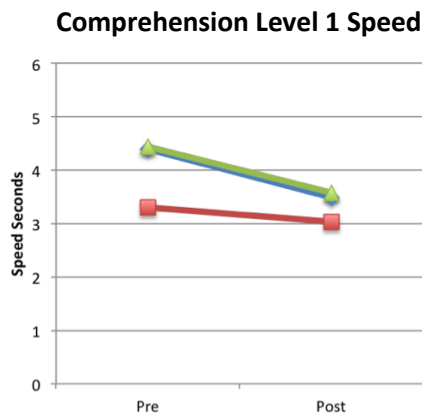
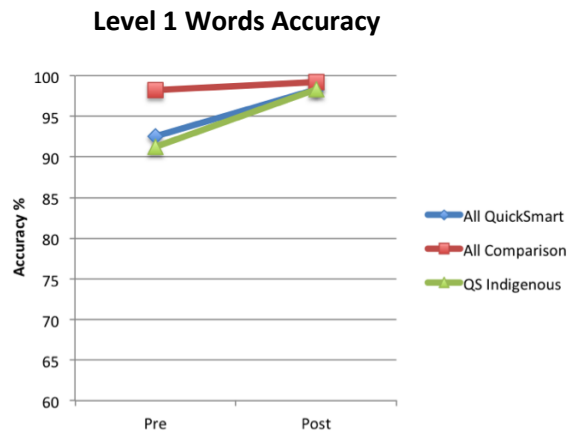
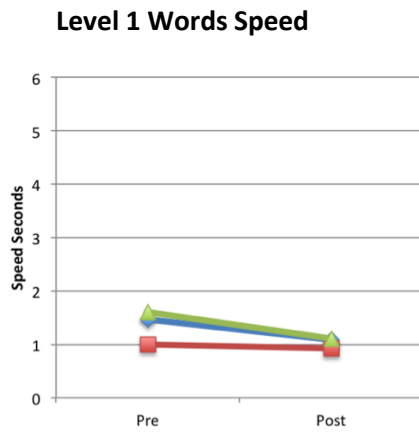
Table 13: OZCAAS results – Indigenous students 2015

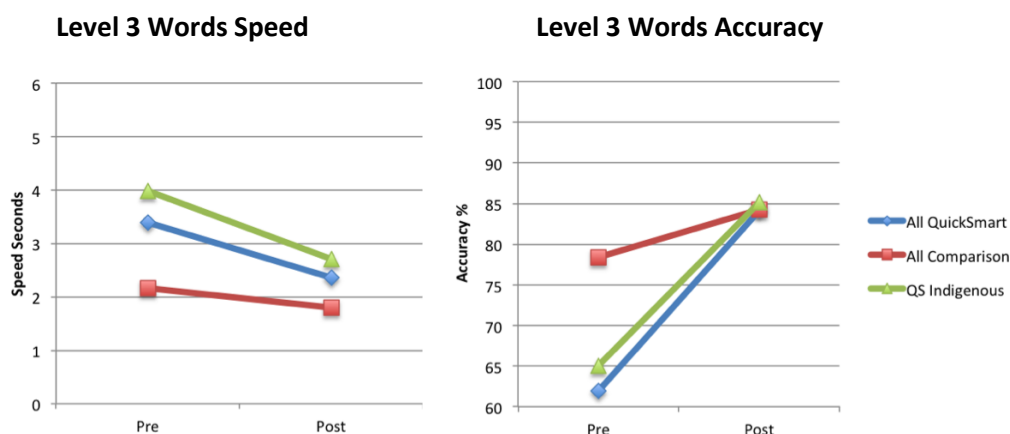
Test	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Essential Words QS (speed)	133	1.056	0.482	0.843	0.285	-0.212	<0.001*	0.537
Essential Words QS (accuracy)	133	97.495	6.666	99.478	1.948	1.983	<0.001*	0.404
Level 1 Words QS (speed)	134	1.603	1.292	1.11	0.58	-0.494	<0.001*	0.493
Level 1 Words QS (accuracy)	134	91.237	13.566	98.343	5.173	7.106	<0.001*	0.692
Comprehension Level 1 QS (speed)	127	4.438	2.092	3.578	1.741	-0.86	<0.001*	0.447
Comprehension Level 1 QS (accuracy)	127	94.043	10.76	98.218	5.093	4.175	<0.001*	0.496
Level 2 Words QS (speed)	128	2.25	2.101	1.543	1.427	-0.707	<0.001*	0.393
Level 2 Words QS (accuracy)	128	83.705	20.42	94.72	10.471	11.015	<0.001*	0.679
Comprehension Level 2 QS (speed)	117	6.891	3.078	5.764	2.539	-1.127	<0.001*	0.399
Comprehension Level 2 QS (accuracy)	117	82.094	17.329	90.297	13.275	8.203	<0.001*	0.531
Level 3 Words QS (speed)	114	3.978	2.909	2.705	2.428	-1.273	<0.001*	0.475
Level 3 Words QS (accuracy)	114	65.059	26.375	85.189	18.183	20.13	<0.001*	0.889

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 speed and accuracy results are limited by the ceiling effect (the pre-intervention scores were so high that the students did not have much room for further improvement). For Comprehension 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).







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

To complete this section on OZCAAS results, it is important to note that there were students who the instructors confirmed were not able to complete all the OZCAAS pre-tests. In such cases Instructors were advised not to continue collecting data as doing so would have dramatically confronted these students with their weaknesses at the beginning of the program.

A mark of the success of *QuickSmart* is that many of these students were able to complete all OZCAAS 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: OZCAAS results where no pre-test data were available – 2015

	N	Mean	Std. Deviation
Essential Words QS (speed)	23	0.87	0.266
Essential Words QS (accuracy)	23	97.122	6.898
Level 1 Words QS (speed)	30	1.36	1.005
Level 1 Words QS (accuracy)	30	88.77	21.522
Comprehension Level 1 QS (speed)	30	4.093	2.773
Comprehension Level 1 QS (accuracy)	30	87.173	17.607
Level 2 Words QS (speed)	49	2.031	1.866
Level 2 Words QS (accuracy)	49	79.41	25.968
Comprehension Level 2 QS (speed)	69	7.083	3.803
Comprehension Level 2 QS (accuracy)	69	80.98	22.602
Level 3 Words QS (speed)	96	3.704	2.96
Level 3 Words QS (accuracy)	96	63.792	29.566

The results in Table 14 are impressive given that these students did not have the skills or confidence to complete the OZCAAS pre-tests initially. In Essential Words and Level 1 Words, the average response rates at the end of the program were below the target of two seconds, with accuracy results above 88%. In Level 2 Words, the average response rates were below 2.1 seconds, with average accuracy above 79%.

In Comprehension Level 1, the average response rates were almost within the goal range, with average accuracy above 87%. Even though some of these students may not have progressed to Level 3 Words during *QuickSmart* lessons, their post-test results are encouraging with

response speeds below 3.8 seconds and accuracy over 63% at post-test. It is likely that part of this improvement may be due to the fact that students’:

- increased their ability to benefit from classroom instruction; and
- improved their levels of confidence may have led to a ‘have a go attitude’ that was not present at the beginning of the *QuickSmart* program.

4.5 Conclusion for OZCAAS 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 lower-achieving students, as reading is a vital skill underpinning learning in general. This improvement provides the foundation for students to improve in areas related to the application of reading skills that are not specifically taught in *QuickSmart*.

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

It is acknowledged that Indigenous students had lower finishing points on some assessments but their overall pre-test to post-test improvement is significant and comparable to that of the overall *QuickSmart* group.

5 Independent Assessments

5.1 Why They are Used

The *QuickSmart* pre- and post-assessments include independent tests in order to demonstrate whether students are able to 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 regions 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 (2008) 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 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) 2015

Group	Students with paired data	Average Gain score	Significance	Effect size
All <i>QuickSmart</i> Vocabulary	715	6.931	<0.001*	0.69
All Comparison Vocabulary	201	4.304	<0.001*	0.399
All <i>QuickSmart</i> Comprehension	1039	6.033	<0.001*	0.572
All Comparison Comprehension	278	4.2	<0.001*	0.377

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) 2015

Gender	Students with paired data	Average Gain score	Significance	Effect size
Vocabulary – QS Male	376	7.554	<0.001*	0.731
Vocabulary – Comp Male	109	4.069	<0.001*	0.395
Vocabulary – QS Female	339	6.239	<0.001*	0.646
Vocabulary – Comp Female	92	4.583	<0.001*	0.402
Comprehension – QS Male	555	6.012	<0.001*	0.575
Comprehension – Comp Male	151	4.238	<0.001*	0.381
Comprehension – QS Female	484	6.057	<0.001*	0.569
Comprehension – Comp Female	127	4.156	<0.001*	0.371

In terms of Scale scores, the results indicate that male *QuickSmart* students improved slightly more in vocabulary compared to female *QuickSmart* students. The female *QuickSmart* students improved marginally more in comprehension. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level for comprehension ($p = 0.520$). However, they are statistically significant for vocabulary ($p = 0.002$).

This finding is possibly an artefact of large sample sizes, which tend to increase the power of the test to the point when even small differences become statistically significant. This was confirmed by a weak effect size (Cohen's $d = 0.157$) for gender differences in Vocabulary. The small effect size indicates that the statistical finding is not meaningful for practical purposes.

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) 2015

Group	Students with paired data	Average Gain score	Significance	Effect size
Indigenous QS Vocabulary	81	7.191	<0.001*	0.719
All Comparison Vocabulary	201	4.304	<0.001*	0.399
Indigenous QS Comprehension	106	6.493	<0.001*	0.697
All Comparison Comprehension	278	4.2	<0.001*	0.377

These results show strong vocabulary improvement for the Indigenous students who participated in *QuickSmart*. These students were able to report a rate of growth higher than the total cohort of *QuickSmart* students and in excess of that achieved by the comparison group. The Indigenous students' Comprehension results also show a strong improvement, with the Indigenous students again reporting a higher growth rate than that shown by the rest of the *QuickSmart* group.

The following figure shows that the *QuickSmart* students consistently achieve the gains in PAT across the middle school grades targeted by the program, that is Grade 5 through to Grade 8. The tables of figures for these graphs are available in the Appendices.

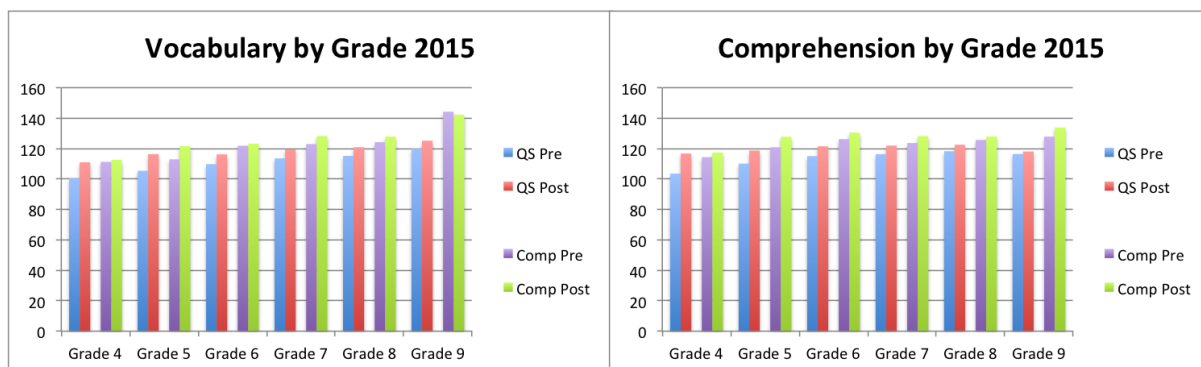


Figure 2: PAT-V and PAT-C by Grade

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
QuickSmart Vocabulary	561	715	78.462
Comparison Vocabulary	142	201	70.647
QuickSmart Comprehension	766	1039	73.725
Comparison Comprehension	189	278	67.986

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 the Schools and Clusters has been critical in making more positive the hopes and aspirations of students participating in the *QuickSmart* program. This report has focused on the quantitative aspects of the program. In all 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 as well as highly significant gains on the part of individual students who, in some cases, 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 the area of 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 with regard to students' attitudes to school, their attendance rates and levels of academic confidence both inside and outside the classroom.

The data collected to date from thousands of *QuickSmart* students indicate that the narrowing of the achievement gap between *QuickSmart* and comparison students results in 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 <http://www.une.edu.au/simerr/quicksmart/pages/qsresearchpublications.php>) demonstrate that *QuickSmart* students can maintain the gains made during the program for years after they completed the program. Analyses have consistently identified 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.

If you have any questions concerning this report or *QuickSmart* please contact us at the SiMERR National Centre at UNE on (02) 67735065.



Professor John Pegg

7 APPENDIX A: Independent Assessment Results

7.1 PAT Results by Region – (Scale Scores) 2015

Cluster of Schools	Pre-Intervention			Post-Intervention		Gain	p	Effect size
	N	Mean	SD	Mean	SD			
Adelaide Vocab - QS Group	44	111.545	11.893	119.275	11.5	7.73	<0.001*	0.661
Adelaide Comprehension - QS Group	92	115.09	8.694	119.877	7.845	4.787	<0.001*	0.578
Geelong Vocab - QS Group	32	110.341	9.115	117.309	5.71	6.968	<0.001*	0.916
Geelong Comprehension - QS Group	32	110.394	9.719	120.403	10.433	10.009	<0.001*	0.993
Gippsland Vocab - QS Group	36	115.967	9.26	119.789	8.491	3.822	0.002*	0.43
Gippsland Comprehension - QS Group	36	117.156	7.277	124.064	8.609	6.908	<0.001*	0.867
Horsham Vocab - QS Group	49	114.496	6.176	119.267	7.53	4.771	<0.001*	0.693
Horsham Comprehension - QS Group	56	119.564	6.387	121.077	7.45	1.513	0.061	0.218
Hunter Vocab - QS Group	43	105.209	8.287	120.03	7.646	14.821	<0.001*	1.859
Hunter Comprehension - QS Group	51	114.561	8.004	126.684	7.95	12.123	<0.001*	1.52
Melbourne Vocab - QS Group	94	114.718	10.209	119.581	9.671	4.863	<0.001*	0.489
Melbourne Comprehension - QS Group	125	115.785	10.419	121.904	10.403	6.119	<0.001*	0.588
New England Vocab - QS Group	0							
New England Comprehension - QS Group	13	123.246	5.711	123.569	7.538	0.323	0.853	0.048
North Coast Vocab - QS Group	126	109.954	10.79	118.741	9.822	8.787	<0.001*	0.852
North Coast Comprehension - QS Group	199	115.846	9.314	124.061	9.721	8.215	<0.001*	0.863
North West Vocab - QS Group	62	108.127	10.274	113.256	11.044	5.129	<0.001*	0.481
North West Comprehension - QS Group	61	112.851	10.482	115.454	11.07	2.603	0.001*	0.241
Queensland Vocab - QS Group	61	114.418	7.129	122.625	10.981	8.207	<0.001*	0.887
Queensland Comprehension - QS Group	156	114.76	14.526	118.236	14.831	3.476	<0.001*	0.237
Riverina Vocab - QS Group	40	112.738	8.951	117.553	9.424	4.815	<0.001*	0.524
Riverina Comprehension - QS Group	52	115.996	8.678	121.023	9.687	5.027	<0.001*	0.547
South Sydney Vocab - QS Group	10	114.6	6.519	121.95	5.291	7.35	0.006*	1.238
South Sydney Comprehension - QS Group	10	117.69	5.017	122.49	8.663	4.8	0.184	0.678
Sydney Vocab - QS Group	85	112.375	11.664	118.459	10.039	6.084	<0.001*	0.559
Sydney Comprehension - QS Group	125	111.919	11.071	119.358	8.288	7.439	<0.001*	0.761
Tasmania Vocab - QS Group	27	107.8	11.464	113.5	8.737	5.7	0.002*	0.559
Tasmania Comprehension - QS Group	25	114.848	9.973	120.432	8.832	5.584	0.001*	0.593
Western Vocab - QS Group	6	115.333	14.783	125.917	6.166	10.584	0.08	0.934
Western Comprehension - QS Group	6	114.8	9.33	126.867	13.035	12.067	0.007*	1.065

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

7.2 PAT Results – by Demographic (Scale Scores) 2015

Demographic	Pre-Intervention			Post-Intervention				
	N	Mean	SD	Mean	SD	Gain	p	Effect size
All Schools Vocabulary – QS Group	715	111.719	10.29	118.65	9.791	6.931	<0.001*	0.69
All Schools Vocabulary – Comp Group	201	120.572	10.02	124.876	11.51	4.304	<0.001*	0.399
All Schools Comprehension – QS Group	1039	115.063	10.491	121.096	10.596	6.033	<0.001*	0.572
All Schools Comprehension – Comp Group	278	123.464	10.333	127.664	11.915	4.2	<0.001*	0.377
Vocabulary – QS Indigenous	81	106.793	10.463	113.984	9.525	7.191	<0.001*	0.719
Comprehension – QS Indigenous	106	113.317	8.842	119.81	9.766	6.493	<0.001*	0.697
Vocabulary – QS Male	376	112.02	10.794	119.574	9.863	7.554	<0.001*	0.731
Vocabulary – Comp Male	109	120.769	9.815	124.838	10.748	4.069	<0.001*	0.395
Vocabulary – QS Female	339	111.385	9.706	117.624	9.622	6.239	<0.001*	0.646
Vocabulary – Comp Female	92	120.339	10.307	124.922	12.412	4.583	<0.001*	0.402
Comprehension – QS Male	555	114.951	10.403	120.963	10.516	6.012	<0.001*	0.575
Comprehension – Comp Male	151	123.087	10.799	127.325	11.454	4.238	<0.001*	0.381
Comprehension – QS Female	484	115.192	10.6	121.249	10.696	6.057	<0.001*	0.569
Comprehension – Comp Female	127	123.913	9.773	128.069	12.476	4.156	<0.001*	0.371

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

7.3 PAT Results – by State (Scale Scores) 2015

Demographic	Pre-Intervention			Post-Intervention				
	N	Mean	SD	Mean	SD	Gain	p	Effect size
NSW Vocabulary – QS Group	372	110.165	10.673	117.986	9.922	7.821	<0.001*	0.759
NSW Vocabulary – Comp Group	97	120.122	10.355	125.269	12.705	5.147	<0.001*	0.444
NSW Comprehension – QS Group	517	114.641	9.807	121.851	9.883	7.21	<0.001*	0.732
NSW Comprehension – Comp Group	123	124.103	10.27	128.693	12.874	4.59	<0.001*	0.394
Qld Vocabulary – QS Group	61	114.418	7.129	122.625	10.981	8.207	<0.001*	0.887
Qld Vocabulary – Comp Group	14	118.686	7.464	120.429	9.674	1.743	0.313	0.202
Qld Comprehension – QS Group	156	114.76	14.526	118.236	14.831	3.476	<0.001*	0.237
Qld Comprehension – Comp Group	33	120.839	12.217	123.006	11.501	2.167	0.087	0.183
SA Vocabulary – QS Group	44	111.545	11.893	119.275	11.5	7.73	<0.001*	0.661
SA Vocabulary – Comp Group	9	111.578	11.802	118.589	7.219	7.011	0.014	0.717
SA Comprehension – QS Group	92	115.09	8.694	119.877	7.845	4.787	<0.001*	0.578
SA Comprehension – Comp Group	31	122.265	8.746	127.626	9.383	5.361	<0.001*	0.591
Tas Vocabulary – QS Group	27	107.8	11.464	113.5	8.737	5.7	0.002*	0.559
Tas Vocabulary – Comp Group	5	116.18	8.487	122.4	7.808	6.22	0.001*	0.763
Tas Comprehension – QS Group	25	114.848	9.973	120.432	8.832	5.584	0.001*	0.593
Tas Comprehension – Comp Group	3	117.7	4.803	116.9	0.52	-0.8	0.802	0.234
Vic Vocabulary – QS Group	211	114.216	9.186	119.199	8.478	4.983	<0.001*	0.564
Vic Vocabulary – Comp Group	76	122.849	9.217	126.101	10.538	3.252	<0.001*	0.328
Vic Comprehension – QS Group	249	116.14	9.472	121.837	9.571	5.697	<0.001*	0.598
Vic Comprehension – Comp Group	88	124.175	10.241	128.353	11.242	4.178	<0.001*	0.389

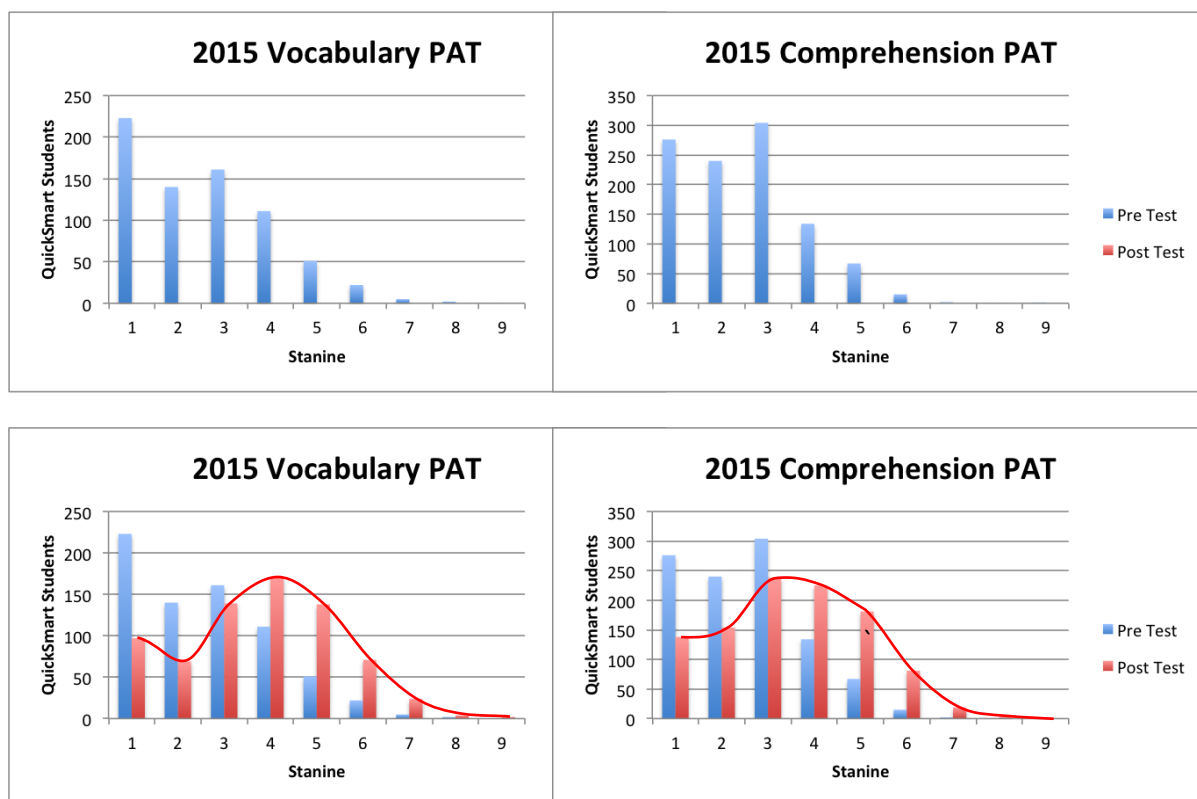
Note: only students who did both ‘pre’ and ‘post’ test are included in the table.

7.4 PAT Results – by Grade (Scale Scores) 2015

Grade	Pre-Intervention			Post-Intervention				
	N	Mean	SD	Mean	SD	Gain	p	Effect size
Grade 4 Vocabulary – QS Group	48	100.538	7.131	111.0	8.952	10.462	<0.001*	1.293
Grade 4 Vocabulary – Comp Group	23	111.243	5.787	112.543	13.677	1.3	0.627	0.124
Grade 4 Comprehension – QS Group	52	103.523	11.0	116.733	9.936	13.21	<0.001*	1.26
Grade 4 Comprehension – Comp Group	25	114.348	4.946	117.392	13.195	3.044	0.258	0.305
Grade 5 Vocabulary – QS Group	104	105.398	8.951	116.351	9.683	10.953	<0.001*	1.175
Grade 5 Vocabulary – Comp Group	33	112.918	8.638	121.542	9.311	8.624	<0.001*	0.96
Grade 5 Comprehension – QS Group	147	110.107	9.122	118.688	8.989	8.581	<0.001*	0.948
Grade 5 Comprehension – Comp Group	45	120.849	10.22	127.76	13.088	6.911	<0.001*	0.589
Grade 6 Vocabulary – QS Group	71	109.749	9.597	116.192	8.198	6.443	<0.001*	0.722
Grade 6 Vocabulary – Comp Group	26	121.838	5.582	123.231	8.505	1.393	0.359	0.194
Grade 6 Comprehension – QS Group	112	115.062	9.367	121.458	9.363	6.396	<0.001*	0.683
Grade 6 Comprehension – Comp Group	35	126.197	8.33	130.466	8.936	4.269	0.002*	0.494
Grade 7 Vocabulary – QS Group	282	113.544	9.172	119.512	8.917	5.968	<0.001*	0.66
Grade 7 Vocabulary – Comp Group	62	122.966	7.156	128.181	8.249	5.215	<0.001*	0.675
Grade 7 Comprehension – QS Group	412	116.337	8.846	121.937	11.307	5.6	<0.001*	0.552
Grade 7 Comprehension – Comp Group	92	123.617	10.379	128.154	10.559	4.537	<0.001*	0.433
Grade 8 Vocabulary – QS Group	194	115.209	9.581	120.891	10.424	5.682	<0.001*	0.568
Grade 8 Vocabulary – Comp Group	53	124.187	10.351	127.857	11.603	3.67	0.001*	0.334
Grade 8 Comprehension – QS Group	279	118.254	7.851	122.528	8.281	4.274	<0.001*	0.53
Grade 8 Comprehension – Comp Group	69	125.665	9.241	127.888	11.425	2.223	0.069	0.214
Grade 9 Vocabulary – QS Group	13	119.892	9.465	125.192	9.002	5.3	0.326	0.574
Grade 9 Vocabulary – Comp Group	3	144.2	10.928	142.2	9.861	-2.0	0.85	0.192
Grade 9 Comprehension – QS Group	30	116.423	23.387	118.047	18.542	1.624	0.055	0.077
Grade 9 Comprehension – Comp Group	11	127.836	13.922	133.8	13.504	5.964	0.299	0.435

Note: Grades 3 and 10 had less than 5 students and were excluded from the analysis.

7.5 National Literacy PAT Improvement of QuickSmart Students for 2015



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 4-10% of the population
- 3 represents performance in the lower 11-22% of the population
- 4 represents performance in the lower 23-39% of the population
- 5 represents performance in middle 40-59% of the population
- 6 represents performance in the higher 60-76% of the population
- 7 represents performance in the higher 77-88% 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.

8 APPENDIX B: *QuickSmart* Sessions

8.1 Attendance Summary

QS Students	N (students)	N (schools)	Mean Sessions Offered	Mean Sessions Attended	% Mean Attended	Weeks completed	% Program completed
All QS	971	63	64.158	49.584	76.799	16.528	55.093
Male	524	62	63.18	48.46	76.177	16.153	53.844
Female	447	61	65.306	50.902	77.532	16.967	56.557
Indigenous	115	30	57.478	40.922	69.624	13.641	45.469
Grade 4	45	8	73.867	61.867	83.284	20.622	68.741
Grade 5	136	21	68.794	57.985	84.096	19.328	64.428
Grade 6	100	20	72.26	59.49	82.976	19.83	66.1
Grade 7	370	31	63.489	48.935	76.862	16.312	54.372
Grade 8	278	30	59.324	41.766	70.022	13.922	46.407
Grade 9	37	9	59.595	44.27	74.439	14.757	49.189

Note: only students and schools for whom attendance data were provided are included in the table (about 65% of students).

Note: 'Weeks completed' is based on the assumption that the school did three *QuickSmart* sessions a week

Note: '% Program completed' is calculated relative to the full *QuickSmart* program of 30 weeks.

Note: Other grades were excluded from the analyses as they had fewer than 5 *QuickSmart* students with attendance.