



SiMERR
National Research Centre

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Annual Literacy Program Report

2011

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The SiMERR National Research Centre

The University of New England

ARMIDALE NSW

quicksmart

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1 QuickSmart in 2011

In 2011, the *QuickSmart* team at the University of New England received data from 331 students who participated in *QuickSmart* Literacy lessons and 139 average-achieving comparison peers. These students were drawn from 2 clusters of schools from around Australia as well as other trial schools in NSW and Tasmania. Further data were also submitted for independent analysis to the Northern Territory (NT) Department of Education and Training by NT schools.

The analyses presented in this report provide information about students' performance on the Cognitive Aptitude Assessment System (OZCAAS) and on standardised test measures, specifically the Progressive Achievement Tests in Vocabulary and Comprehension (ACER, 2008) and the VCAA On-Demand tests used by some schools in Victoria. Further investigation of the data provided in this report examines the results in terms of gender and for the participating Indigenous students.

2 Background

2.1 Purpose of *QuickSmart*

The prime purpose of the *QuickSmart* 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.

The *QuickSmart* professional learning program is 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 literacy skills of under-achieving students in the middle years of schooling. The 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 development and continuous improvement since 2001.

The intervention is called *QuickSmart* to encourage students to become *quick* in their response speed and *smart* in their understanding and strategy use. 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 the individual piece of text.

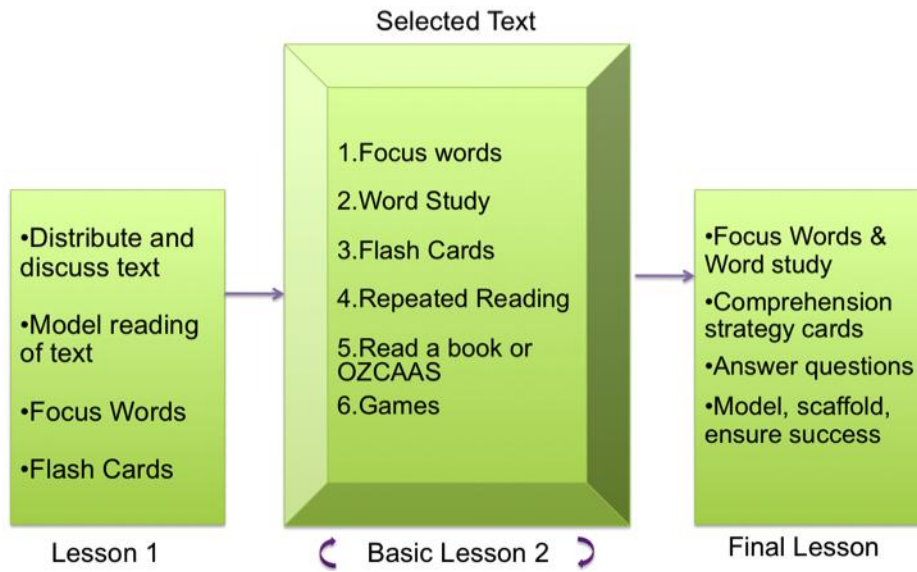


Figure 1: Literacy lesson structures

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 Overall *QuickSmart* results

Two major sets of analyses quantify the benefits of the *QuickSmart* program. The first analysis examines data from speed and accuracy OZCAAS measures related to reading skills that were collected at the beginning and end of the *QuickSmart* program. These results represent a direct measure of the work of *QuickSmart* instructors and reflect the primary focus of the *QuickSmart* lessons.

The second set of analyses concern the results of independent tests. Most schools have utilised the PAT (Progressive Achievement Test) assessments in Vocabulary and Reading Comprehension. These are standardised tests developed by the Australian Council for Education Research (ACER). The PAT is an independent test 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. Some schools in Victoria used the On-Demand Testing designed by Victorian Curriculum and Assessment Authority (VCAA) instead of PAT.

The results from these analyses are reported below in separate sections and include analyses of the data by gender and for participating Indigenous students.

3.1 Results on the OZCAAS assessments

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) Sentence Understanding Level 1; (4) Level 2 Words; (5) Sentence Understanding Level 2; (6) Level 3 Words. 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 which do 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.

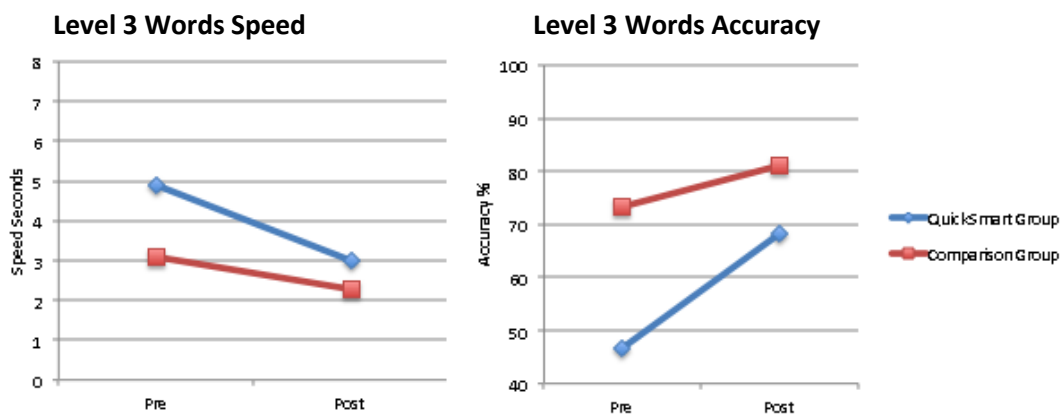
Average results from all Literacy students are presented in Tables 1 to 6 below. A detailed discussion of Tables 1 and 2 are provided for clarification purposes and as a model for understanding the results provided in Tables 3 to 6. Note that the p -values included in tables in this report represent the probability or likelihood that there is no difference between mean scores for pre-intervention and post-intervention results. If this value is less than 0.05 this difference is considered statistically significant. This means that there is a less than 5% probability that the result was obtained by chance. If the p -value is more than 0.05 the two means may still be importantly different, however, there is an increased possibility that chance factors influenced the result. In our analyses this sometimes happens when the number of students in the group is quite small (as is often the case for comparison students).

3.1.1 Combined OZCAAS Analysis

3.1.1.1 Level 3 Words

Table 1: OZCAAS Level 3 Words results - all students 2011

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Level 3 Words QS (speed secs)	131	4.877	3.404	2.988	2.671	-1.888	<0.001*	-0.617
Level 3 Words COMP (speed secs)	67	3.098	2.502	2.28	1.488	-0.818	0.001*	-0.397
Level 3 Words QS (accuracy %)	131	46.496	27.693	68.311	24.573	21.816	<0.001*	0.833
Level 3 Words COMP (accuracy %)	67	73.19	21.526	81.096	16.498	7.906	<0.001*	0.412



On the Level 3 Words test, there were paired data for 131 *QuickSmart* students and 67 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 almost 1.9 seconds, which is a strong result. The effect size for this result is -0.617, which indicates very strong improvement. (Note the negative number means that the post-test time is lower than the pre-test time which is the desired pattern of 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:

- Effect sizes below 0.2 are considered poor, with an appropriate range of growth over an academic year for a student cohort established as within the range of 0.2 to 0.4;
- Effect size scores of 0.4 to 0.6 are considered strong;
- Effect sizes between 0.6 and 0.8 are considered very strong; and
- Effect size scores above 0.8 represent substantial improvement of the order of approximately three years' growth.

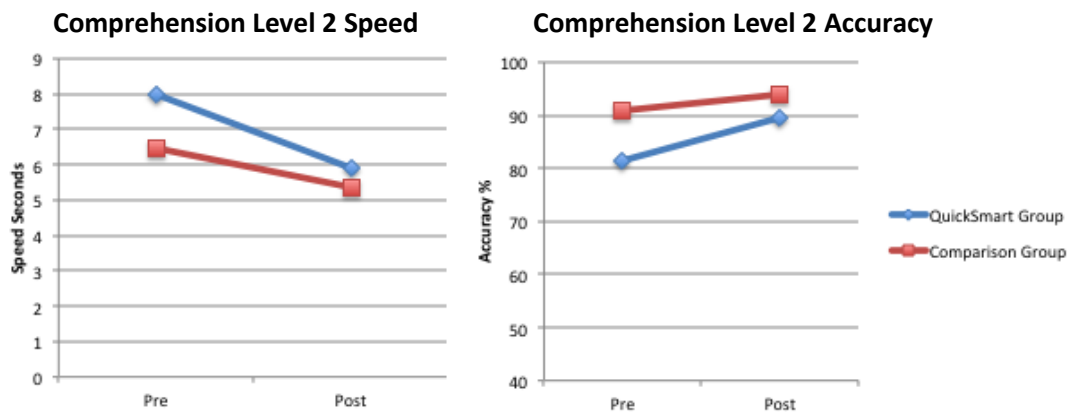
In terms of accuracy, the *QuickSmart* students' average scores have improved by over 21.8 percentage points, which is a very strong result. The effect size is 0.833, which indicates substantial improvement for the *QuickSmart* group.

Table 1 shows that when compared to the scores of the comparison students *QuickSmart* students' scores indicate substantial improvement in terms of speed and accuracy in Level 3 words.

3.1.1.2 Comprehension Level 2

Table 2: OZCAAS Comprehension Level 2 - all students 2011

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Comprehension Level 2 QS (speed secs)	253	7.977	3.49	5.886	2.963	-2.092	<0.001*	-0.646
Comprehension Level 2 COMP (speed secs)	121	6.479	2.845	5.365	2.336	-1.114	<0.001*	-0.428
Comprehension Level 2 QS (accuracy %)	253	81.347	17.688	89.655	13.675	8.308	<0.001*	0.526
Comprehension Level 2 COMP (accuracy %)	121	90.783	9.502	93.76	7.314	2.977	0.001*	0.351



On the Comprehension Level 2 test, there were paired data for 253 *QuickSmart* students and 121 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 2.092 seconds, which is a strong result. The effect size for this result is -0.646, which indicates very strong improvement.

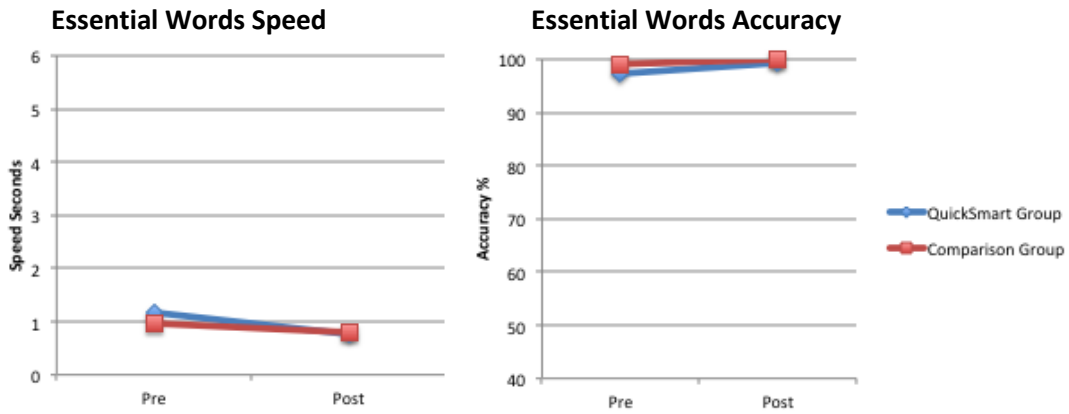
In terms of accuracy, the *QuickSmart* students' average scores have improved by more than 8.3 percentage points, which is a very strong result. The effect size is 0.526, which indicates strong improvement for the *QuickSmart* group.

Table 2 shows that when compared to the scores of the comparison students, *QuickSmart* students' scores indicate substantial improvement in terms of speed and accuracy in comprehension.

3.1.1.3 Essential Words

Table 3: OZCAAS Essential Words - all students 2011

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Essential words QS (speed)	250	1.183	0.779	0.758	0.304	-0.425	<0.001*	-0.718
Essential words Comp (speed)	112	0.972	0.553	0.799	0.318	-0.173	0.001*	-0.384
Essential words QS (acc)	250	97.173	8.332	99.319	3.131	2.146	<0.001*	0.341
Essential words Comp (acc)	112	99.107	4.66	99.9	0.745	0.793	0.079	0.238

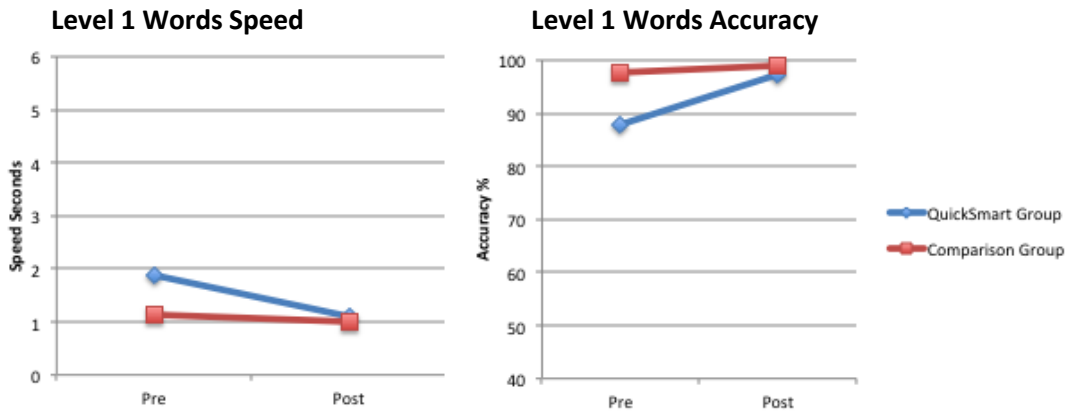


The results for Essential Words, the most commonly used words that should be known by middle school students, indicate a stronger improvement for the *QuickSmart* students. However, the accuracy results show a strong ceiling effect as the results were already at a high level at pre-test for both groups.

3.1.1.4 Level 1 Words

Table 4: OZCAAS Level 1 Words - all students 2011

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Level 1 Words QS (speed secs)	282	1.876	1.666	1.099	0.875	-0.777	<0.001*	-0.584
Level 1 Words COMP (speed secs)	121	1.132	1.174	1.005	1.248	-0.127	0.003*	-0.105
Level 1 Words QS (accuracy %)	282	87.699	16.382	97.18	6.935	9.48	<0.001*	0.754
Level 1 Words COMP (acc %)	121	97.693	6.13	98.99	3.017	1.298	0.008*	0.269

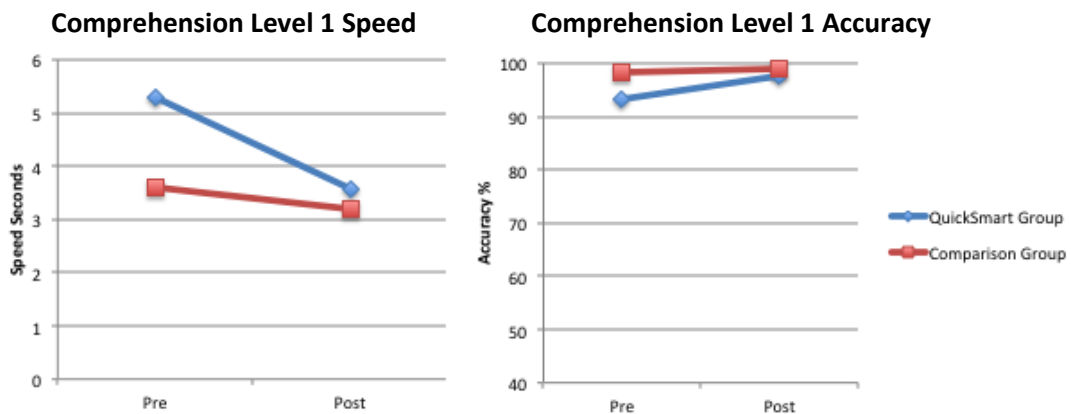


The results for Level 1 Words indicate a very strong improvement for the *QuickSmart* students. The diagrams illustrate the narrowing of the gap between the *QuickSmart* students and comparison students.

3.1.1.5 Comprehension Level 1

Table 5: OZCAAS Comprehension Level 1 - all students 2011

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Comprehension Level 1 QS (speed secs)	272	5.299	2.774	3.579	2.125	-1.72	<0.001*	-0.696
Comprehension Level 1 COMP (speed secs)	121	3.593	1.313	3.188	1.417	-0.405	0.001*	-0.296
Comprehension Level 1 QS (accuracy %)	272	93.26	12.063	97.643	5.612	4.383	<0.001*	0.466
Comprehension Level 1 COMP (accuracy %)	121	98.205	4.792	98.944	3.18	0.739	0.159	0.182

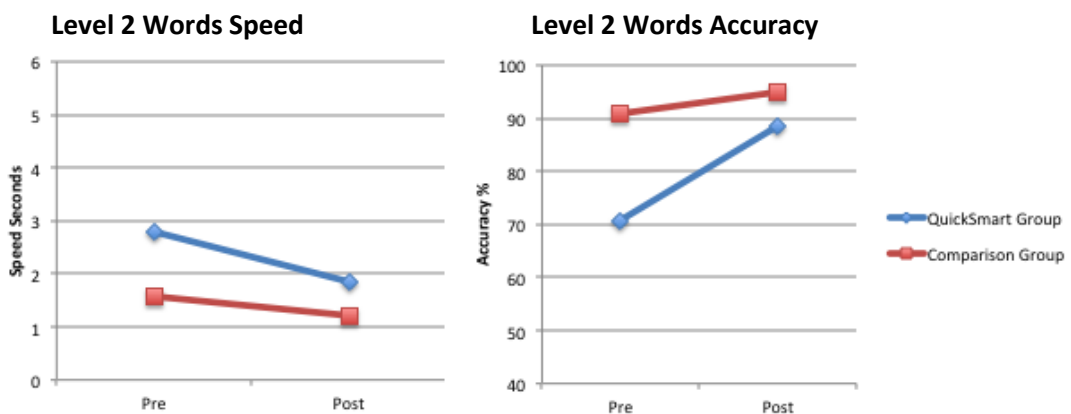


The results for Comprehension Level 1 indicate a very strong improvement for the *QuickSmart* students. The diagrams illustrate the narrowing of the gap between the *QuickSmart* students and comparison students.

3.1.1.6 Level 2 Words

Table 6: OZCAAS Level 2 Words - all students 2011

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Level 2 Words QS (speed secs)	245	2.806	2.141	1.853	1.802	-0.952	<0.001*	-0.481
Level 2 Words COMP (speed secs)	113	1.579	1.105	1.214	0.609	-0.365	<0.001*	-0.409
Level 2 Words QS (accuracy %)	245	70.726	26.262	88.678	14.861	17.952	<0.001*	0.841
Level 2 Words COMP (acc %)	113	90.73	9.619	94.788	7.848	4.058	<0.001*	0.462



The results for Level 2 Words indicate a significant improvement for the *QuickSmart* students. The diagrams illustrate the narrowing of the gap between the *QuickSmart* students and comparison students as a result of the *QuickSmart* intervention.

3.1.2 OZCAAS By Demographics

3.1.2.1 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 2011

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Male QS (speed)	141	1.209	0.809	0.73	0.256	-0.479	<0.001*	-0.798
Male COMP (speed)	51	0.929	0.536	0.835	0.365	-0.093	0.168	-0.204
Female QS (speed)	109	1.15	0.742	0.795	0.354	-0.355	<0.001*	-0.611
Female COMP (speed)	61	1.008	0.568	0.768	0.271	-0.24	0.003*	-0.539
Male QS (accuracy)	141	96.272	10.117	99.333	2.812	3.061	<0.001*	0.412
Male COMP (accuracy)	51	99.02	4.901	99.89	0.784	0.87	0.218	0.248
Female QS (accuracy)	109	98.338	4.993	99.301	3.515	0.963	0.025*	0.223
Female COMP (accuracy)	61	99.18	4.489	99.908	0.717	0.728	0.218	0.226

The results of *QuickSmart* students show that in both speed and accuracy the males have improved slightly more than females.

3.1.2.2 Level 1 Words by Gender

Table 8: OZCAAS Level 1 Words results – all students by gender 2011

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Male QS (speed)	162	1.904	1.543	1.103	0.749	-0.801	<0.001*	-0.66
Male COMP (speed)	53	1.28	1.696	1.148	1.84	-0.132	0.038*	-0.074
Female QS (speed)	120	1.838	1.825	1.092	1.024	-0.746	<0.001*	-0.504
Female COMP (speed)	68	1.016	0.452	0.893	0.365	-0.123	0.033*	-0.299
Male QS (accuracy)	162	86.085	18.292	96.664	8.17	10.579	<0.001*	0.747
Male COMP (accuracy)	53	96.823	8.178	98.643	3.184	1.821	0.042*	0.293
Female QS (accuracy)	120	89.879	13.141	97.877	4.734	7.998	<0.001*	0.81
Female COMP (accuracy)	68	98.371	3.785	99.26	2.875	0.89	0.086	0.265

The results of *QuickSmart* students show that in terms of gain scores related to both speed and accuracy the males have improved slightly more than females.

3.1.2.3 Comprehension Level 1 by Gender

Table 9: OZCAAS Comprehension Level 1 results – all students by gender 2011

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Male QS (speed)	155	5.507	2.855	3.778	2.29	-1.73	<0.001*	-0.668
Male COMP (speed)	54	3.682	1.306	3.515	1.27	-0.167	0.235	-0.13
Female QS (speed)	117	5.023	2.65	3.315	1.862	-1.708	<0.001*	-0.746
Female COMP (speed)	67	3.521	1.323	2.925	1.483	-0.596	0.002*	-0.424
Male QS (accuracy)	155	92.926	12.671	97.275	6.533	4.349	<0.001*	0.431
Male COMP (accuracy)	54	97.922	5.962	98.531	4.111	0.609	0.549	0.119
Female QS (accuracy)	117	93.702	11.245	98.131	4.06	4.429	<0.001*	0.524
Female COMP (accuracy)	67	98.433	3.618	99.276	2.136	0.843	0.084	0.284

The results of *QuickSmart* students show that in terms of gain scores for speed the males have improved slightly more than females and the females improved slightly more in accuracy. However these differences are minor.

3.1.2.4 Level 2 Words by Gender

Table 10: OZCAAS Level 2 Words results – all students by gender 2011

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	<i>p</i>	Effect size
Male QS (speed)	144	2.781	2.065	1.907	1.839	-0.874	<0.001*	-0.447
Male COMP (speed)	51	1.416	0.849	1.251	0.64	-0.165	0.046*	-0.22
Female QS (speed)	101	2.842	2.254	1.777	1.755	-1.064	<0.001*	-0.527
Female COMP (speed)	62	1.713	1.269	1.184	0.585	-0.529	<0.001*	-0.536
Male QS (accuracy)	144	69.712	27.726	87.776	16.259	18.064	<0.001*	0.795
Male COMP (accuracy)	51	91.502	9.447	96.104	5.926	4.602	<0.001*	0.584
Female QS (accuracy)	101	72.172	24.082	89.965	12.571	17.793	<0.001*	0.926
Female COMP (accuracy)	62	90.095	9.79	93.706	9.037	3.611	0.003*	0.383

The results of *QuickSmart* students show that in speed the females have improved slightly more than males, but in accuracy the genders performed equally well.

3.1.2.5 Comprehension Level 2 by Gender

Table 11: OZCAAS Comprehension Level 2 results – all students by gender 2011

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Male QS (speed)	150	8.13	3.335	5.962	2.925	-2.167	<0.001*	-0.691
Male COMP (speed)	52	6.326	2.946	5.692	2.51	-0.634	0.089	-0.232
Female QS (speed)	103	7.756	3.709	5.774	3.028	-1.981	<0.001*	-0.585
Female COMP (speed)	69	6.595	2.782	5.119	2.182	-1.476	<0.001*	-0.59
Male QS (accuracy)	150	80.621	19.249	89.273	13.643	8.652	<0.001*	0.519
Male COMP (accuracy)	52	89.533	11.321	94.117	7.841	4.585	0.001*	0.471
Female QS (accuracy)	103	82.403	15.159	90.21	13.769	7.807	<0.001*	0.539
Female COMP (accuracy)	69	91.725	7.817	93.49	6.938	1.765	0.098	0.239

The results of *QuickSmart* students show that in terms of gain scores for both speed of response and accuracy the males have improved slightly more than the females.

3.1.2.6 Level 3 Words by Gender

Table 12: OZCAAS Level 3 Words results – all students by gender 2011

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Male QS (speed)	82	4.955	3.762	2.936	2.496	-2.019	<0.001*	-0.632
Male COMP (speed)	34	2.751	2.085	2.238	1.13	-0.513	0.05*	-0.306
Female QS (speed)	49	4.745	2.735	3.076	2.965	-1.669	0.003*	-0.585
Female COMP (speed)	33	3.456	2.858	2.324	1.801	-1.132	0.005*	-0.474
Male QS (accuracy)	82	46.102	27.809	68.205	26.166	22.102	<0.001*	0.819
Male COMP (accuracy)	34	70.612	23.828	80.259	16.046	9.647	0.003*	0.475
Female QS (accuracy)	49	47.153	27.772	68.49	21.908	21.336	<0.001*	0.853
Female COMP (accuracy)	33	75.845	18.864	81.958	17.156	6.112	0.039*	0.339

The results of *QuickSmart* students show that in terms of gain scores for both speed of response and accuracy the males have improved slightly more than the females.

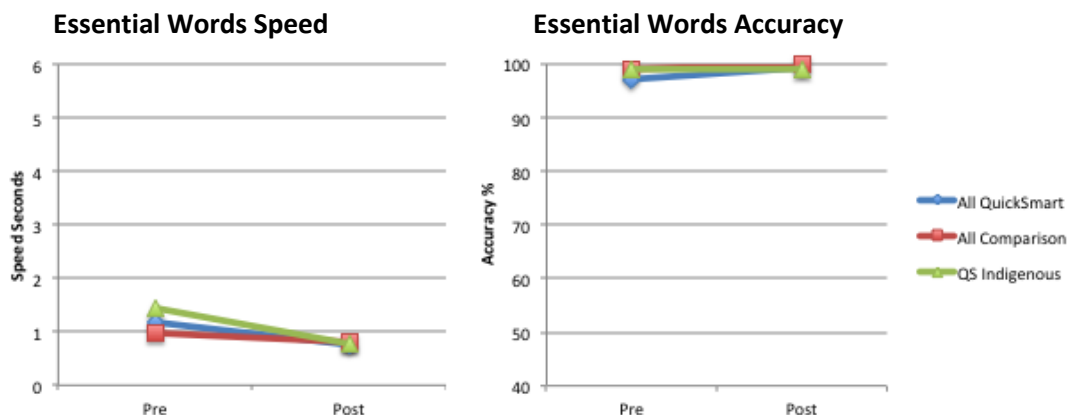
3.1.2.7 Indigenous students

Table 13: OZCAAS results - Indigenous students 2011

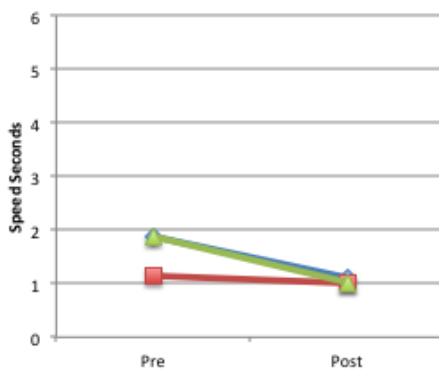
Test	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Essential words QS (speed)	6	1.456	1.157	0.764	0.251	-0.691	0.231	-0.826
Essential words QS (acc)	6	99.067	2.286	99.117	2.164	0.05	0.973	0.023
Level 1 words QS (speed)	11	1.875	1.543	1.022	0.398	-0.853	0.1	-0.757
Level 1 words QS (acc)	11	93.182	7.589	100.0	0.0	6.818	0.014*	1.271
Comprehension Level 1 QS (speed)	10	5.032	2.797	4.098	1.951	-0.934	0.105	-0.387
Comprehension Level 1 QS (acc)	10	93.15	11.513	99.29	2.245	6.14	0.079	0.74
Level 2 words QS (speed)	10	2.721	1.627	1.596	0.945	-1.124	0.027*	-0.845
Level 2 words QS (acc)	10	84.9	12.826	92.82	9.11	7.92	0.116	0.712
Comprehension Level 2 QS (speed)	10	8.457	4.184	6.995	3.487	-1.462	0.03*	-0.38
Comprehension Level 2 QS (acc)	10	84.05	15.856	93.99	6.749	9.94	0.063	0.816
Level 3 words QS (speed)	5	5.525	3.484	4.247	3.456	-1.278	0.487	-0.368
Level 3 words QS (acc)	5	43.16	7.794	68.06	22.652	24.9	0.021*	1.47

These results indicate that the Indigenous students' results are comparable to those of the overall *QuickSmart* group. The gains in accuracy show that in Level 3 Words and Comprehension Levels 1 and 2, the Indigenous students performed better than 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).

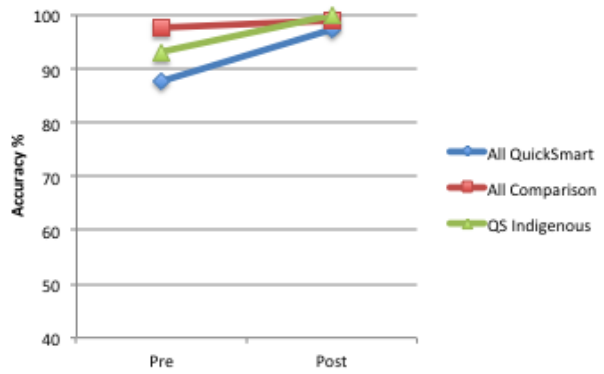
The following graphs illustrate how the Indigenous students (green) have performed in each test compared to the whole *QuickSmart* group (blue) as well as the comparison students (red).



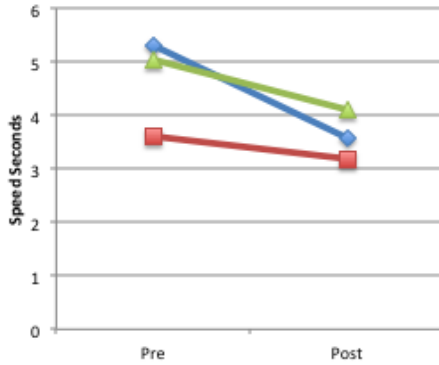
Level 1 Words Speed



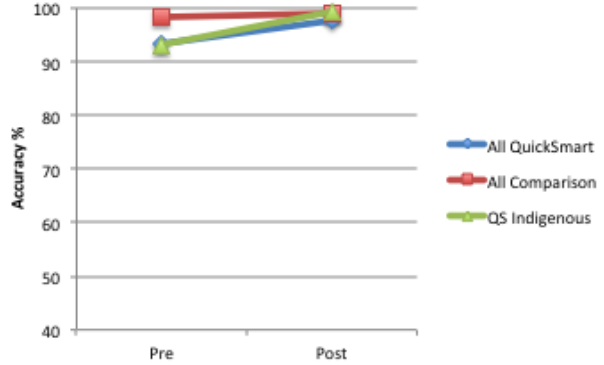
Level 1 Words Accuracy



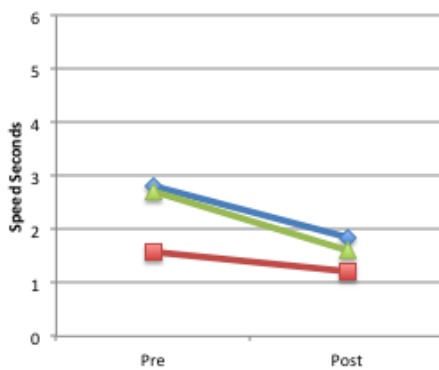
Comprehension Level 1 Speed



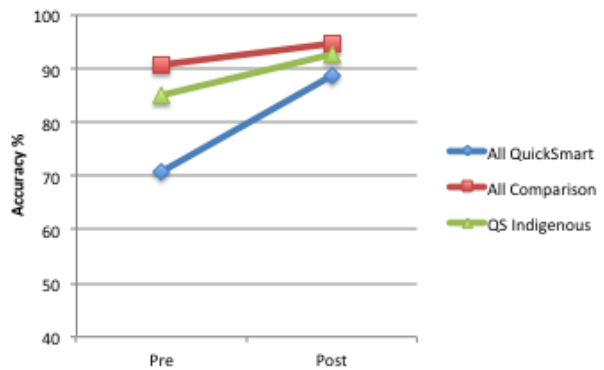
Comprehension Level 1 Accuracy



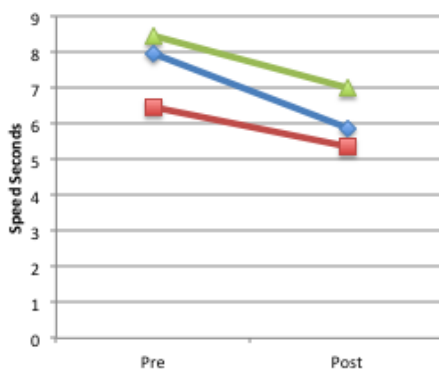
Level 2 Words Speed



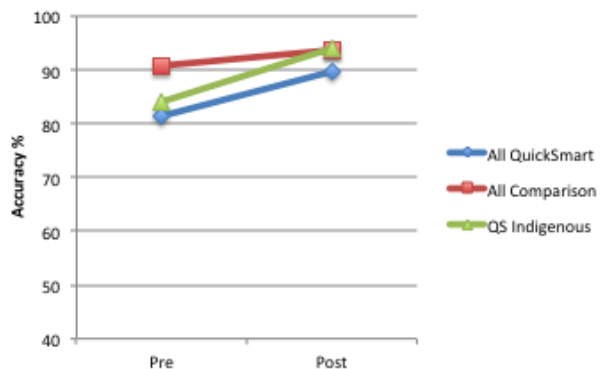
Level 2 Words Accuracy

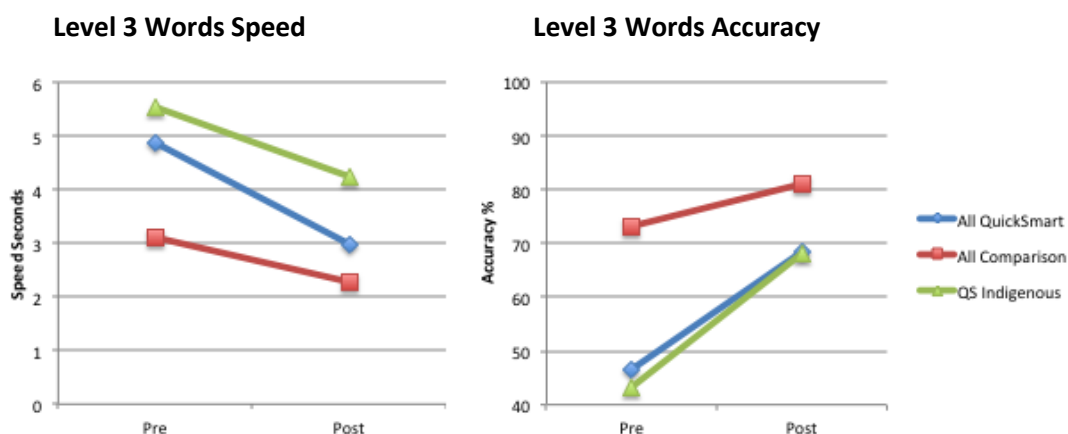


Comprehension Level 2 Speed



Comprehension Level 2 Accuracy





3.1.3 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 23 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 confronted these students dramatically 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 was available - 2011

	N	Mean	Std. Deviation
Essential words QS (speed)	12	0.77	0.21
Essential words QS (acc)	12	99.14	2.01
Level 1 words QS (speed)	4	0.79	0.25
Level 1 words QS (acc)	4	97.28	3.15
Comprehension Level 1 QS (speed)	10	4.921	1.671
Comprehension Level 1 QS (acc)	10	96.56	4.953
Level 2 words QS (speed)	22	2.519	1.48
Level 2 words QS (acc)	22	80.723	21.231
Comprehension Level 2 QS (speed)	22	6.866	3.408
Comprehension Level 2 QS (acc)	22	83.273	14.337
Level 3 words QS (speed)	23	4.18	3.03
Level 3 words QS (acc)	23	61.08	25.41

The results in Table 14 are impressive given that these students did not have the skills or confidence to complete the OZCAAS pre-tests. In Level 2 words and Comprehension Level 1, the average response rates were within a second of the goal range and accuracy above 83%. Even though some of these students may not have progressed to Level 3 Words during *QuickSmart* lessons, their results are encouraging with response speeds below 4.2 seconds and accuracy over 61% at post-test. It is likely that part of this improvement may be due to the fact that: (1) students have increased their ability to benefit from classroom instruction; and (2) students' overall improved levels of confidence may have led to a 'have a go attitude' that was not present at the beginning of the *QuickSmart* program.

3.1.4 Conclusion for OZCAAS Testing

Overall, the *QuickSmart* students showed strong growth in their understanding and use of reading skills. In all levels, they either closed the gap between them and the comparison group of average-achieving peers 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. This improvement provides the foundation for students to improve in other 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. Females performed slightly better in Level 2 Words speed and accuracy. Males performed slightly better in most other tests. These differences, however, are too small to warrant further investigation.

Indigenous students had lower starting and finishing points in all assessment but their overall improvement is significant.

3.2 Independent Assessments

3.2.1 Why they are used

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

3.2.2 Results on the PAT Assessments

Table 15 reports the analysis of the PAT data for all students for whom paired data were available. PAT analyses for individual clusters are provided in as 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 to indicate the magnitude of the change in academic achievement for the *QuickSmart* and comparison students.

Table 15: PAT results - (Scale scores) 2011

Group	Students with paired data	Average Gain score	Significance	Effect size
All <i>QuickSmart</i> Vocabulary	238	6.629	<0.001*	0.61
All Comparison Vocabulary	109	3.629	<0.001*	0.341
All <i>QuickSmart</i> Comprehension	269	6.137	<0.001*	0.543
All Comparison Comprehension	115	5.49	<0.001*	0.448

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

The Vocabulary gain recorded here for the *QuickSmart* group represents approximately 8 months' growth, based on the expected yearly growth in PAT-V of 10 scale score points. The gain in Comprehension for the *QuickSmart* group is well in excess of the expected yearly

growth of students' scores as measured on the PAT-C assessment of between 4 and 5 scale score points.

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

Table 16: PAT results - By Gender (Scale scores) 2011

Gender	Students with paired data	Average Gain score	Significance	Effect size
Vocabulary – QS Male	144	6.324	<0.001*	0.565
Vocabulary – Comp Male	46	2.726	0.043*	0.236
Vocabulary – QS Female	94	7.097	<0.001*	0.684
Vocabulary – Comp Female	63	4.289	<0.001*	0.432
Comprehension – QS Male	154	5.679	<0.001*	0.506
Comprehension – Comp Male	52	4.402	0.003*	0.353
Comprehension – QS Female	115	6.752	<0.001*	0.594
Comprehension – Comp Female	63	6.387	<0.001*	0.525

The results indicate that female *QuickSmart* students performed slightly better in both vocabulary and comprehension compared to male *QuickSmart* students.

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 results - Indigenous (Scale scores) 2011

Group	Students with paired data	Average Gain score	Significance	Effect size
Indigenous QS Vocab	14	6.421	0.015*	0.556
All Comparison Vocab	109	3.629	<0.001*	0.341
Indig QS Comprehension	15	3.72	0.156	0.431
All Comparison Comprehension	115	5.49	<0.001*	0.448

Once again these results show strong improvement for the Indigenous students who participated in *QuickSmart* for Vocabulary. While starting at a lower base, these students were able to report a rate of growth almost equivalent to 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, although not as strong as that shown by the rest of the *QuickSmart* group or the comparison group.

3.2.3 Results on the Victorian On-Demand VCAA Assessment

Table 18 reports the analysis of the VCAA data for all students for whom paired data were available. VCAA analyses for relevant Victorian clusters are provided as an Appendix to this report. (Note: Students who were absent at the end of the year were not included in the analysis).

When reviewing these results, it should be kept in mind that the scale of the On-Demand test is restricted, with most students' scores expected to lie between 2 and 3.5. This restricted range is an artefact of the scaling used in these tests. Specifically, students' achievement at the end of Year Four is pegged to an On-Demand test score of 3.0 and achievement at the end of

Year 5 is expected to be 3.5, and so on. For On-Demand results the value 0.25 is equivalent to 6 months' growth.

Table 18: VCAA results - (VELS scores) 2011

	Students with paired data	Average Gain score	Significance	Effect size
All schools – QS group	46	0.68	<0.001*	0.72
All schools – Comp group	23	0.465	0.022*	0.437

The results are encouraging. *QuickSmart* students showed an average growth of over 12 months over the course of the intervention and a strong improvement measured by Effect Size statistics. This is impressive in light of the fact that (i) this was the first year of implementation of *QuickSmart* Literacy in this group of schools, and (ii) that most of the low-achieving students included in *QuickSmart* groups would not usually be expected to achieve a level of improvement commensurate to the duration of instruction. Again encouragingly, when *QuickSmart* students' On-Demand scores are compared to those of their average-achieving peers in the comparison group, it is evident that the *QuickSmart* students' results are better.

No students undertaking the VCAA tests were identified as Indigenous.

4 Conclusion to Report

The support provided by the Schools and Clusters has been critical in making more positive the hopes and aspirations of more than 270 students. 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



Associate Professor Lorraine Graham

5 APPENDIX – Cluster Results

5.1 Standardised Test results by cluster – (Scale scores for PAT, VELS levels for VCAA On-Demand Tests) 2011

Cluster of Schools		Pre-Intervention		Post-Intervention		Gain	p	Effect size
	N	Mean	SD	Mean	SD			
Horsham Vocab – QS Group	76	108.888	10.661	115.809	10.901	6.921	<0.001*	0.642
Horsham Vocab – Comp Group	36	124.197	13.17	127.708	10.942	3.511	0.009*	0.29
Horsham Comprehension – QS Group	75	111.435	14.573	118.156	14.948	6.721	<0.001*	0.455
Horsham Comprehension – Comp Group	36	130.292	12.366	133.619	12.0	3.327	0.016*	0.273
Outer East Melb Vocab – QS Group	130	107.383	10.814	113.864	11.068	6.481	<0.001*	0.592
Outer East Melb Vocab – Comp Group	60	119.827	10.029	122.91	8.72	3.083	0.007*	0.328
Outer East Melb Comprehension – QS Group	130	111.612	9.205	116.702	10.038	5.09	<0.001*	0.529
Outer East Melb Comprehension – Comp Group	62	122.708	9.859	129.018	11.874	6.31	<0.001*	0.578
VCAA Outer East Melb - QS Group	46	2.622	0.841	3.302	1.039	0.68	<0.001*	0.72
VCAA Outer East Melb - Comp Group	23	3.748	0.986	4.213	1.136	0.465	0.022*	0.437

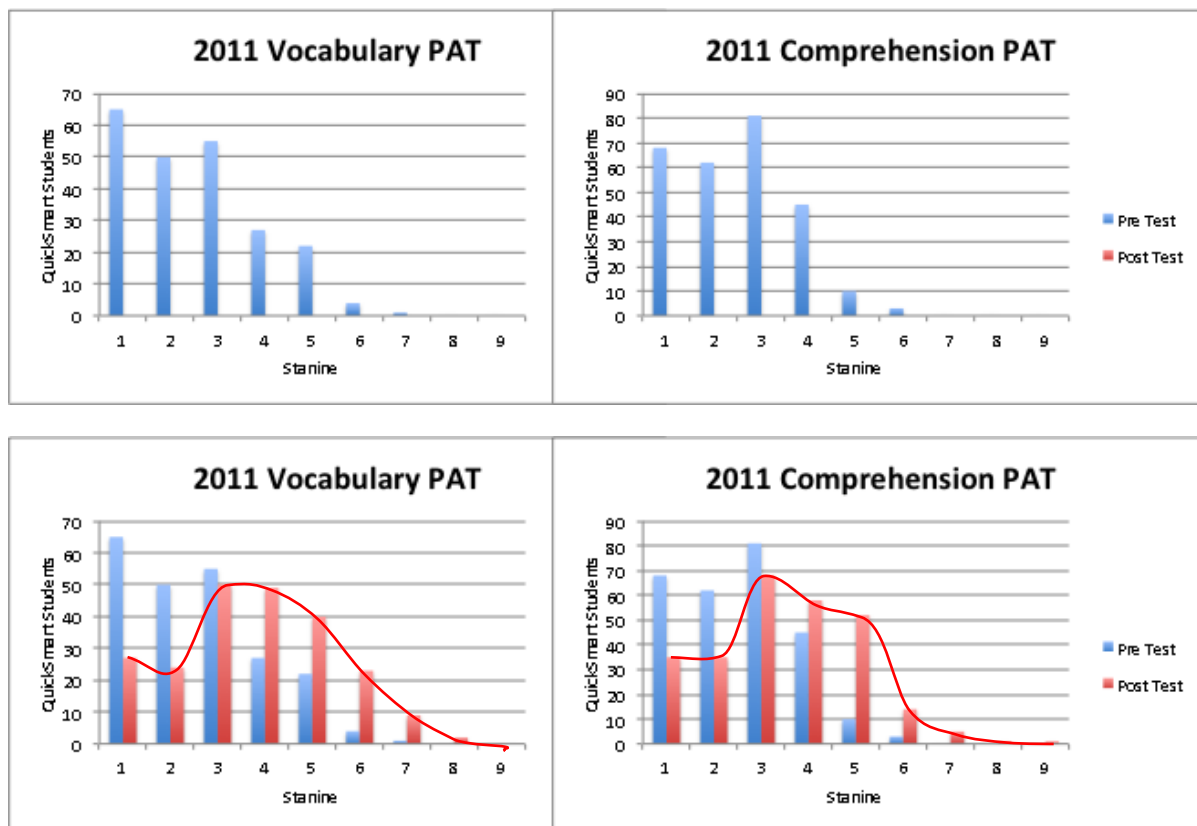
Note 1: only students who did both 'pre' and 'post' test are included in the table.

5.2 PAT results – All Students (Scale scores) 2011

Demographic		Pre-Intervention		Post-Intervention		Gain	p	Effect size
	N	Mean	SD	Mean	SD			
All Schools Vocabulary – QS Group	238	108.358	10.669	114.987	11.058	6.629	<0.001*	0.61
All Schools Vocabulary – Comp Group	109	121.39	11.365	125.019	9.873	3.629	<0.001*	0.341
All Schools Comprehension – QS Group	269	111.835	10.898	117.972	11.685	6.137	<0.001*	0.543
All Schools Comprehension – Comp Group	115	124.879	11.794	130.369	12.723	5.49	<0.001*	0.448
Vocabulary – QS Indigenous	14	107.129	12.166	113.55	10.896	6.421	0.015*	0.556
Comprehension – QS Indigenous	15	111.92	8.956	115.64	8.299	3.72	0.156	0.431
Vocabulary – QS Male	144	108.753	10.918	115.077	11.471	6.324	<0.001*	0.565
Vocabulary – Comp Male	46	122.926	11.965	125.652	11.154	2.726	0.043*	0.236
Vocabulary – QS Female	94	107.751	10.304	114.848	10.451	7.097	<0.001*	0.684
Vocabulary – Comp Female	63	120.268	10.865	124.557	8.888	4.289	<0.001*	0.432
Comprehension – QS Male	154	111.294	10.668	116.973	11.744	5.679	<0.001*	0.506
Comprehension – Comp Male	52	125.883	11.05	130.285	13.753	4.402	0.003*	0.353
Comprehension – QS Female	115	112.558	11.204	119.31	11.521	6.752	<0.001*	0.594
Comprehension – Comp Female	63	124.051	12.401	130.438	11.917	6.387	<0.001*	0.525

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

5.3 National Literacy PAT Improvement of QuickSmart Students for 2011



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 in the bottom 4% of the population,
- 2 represents performance in the lower or 4-10% of the population
- 3 represents performance in the lower or top 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 in 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 various PAT.