Annual Literacy Program Report 2012

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

quicksmart

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Acknowledgements

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1 *QuickSmart* in 2012

In 2012, the *QuickSmart* team at the University of New England received data from 881 students who participated in *QuickSmart* Literacy lessons and 260 average-achieving comparison peers. These students were drawn from 8 clusters of schools from around Australia as well as other trial schools in NSW, Queensland 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.

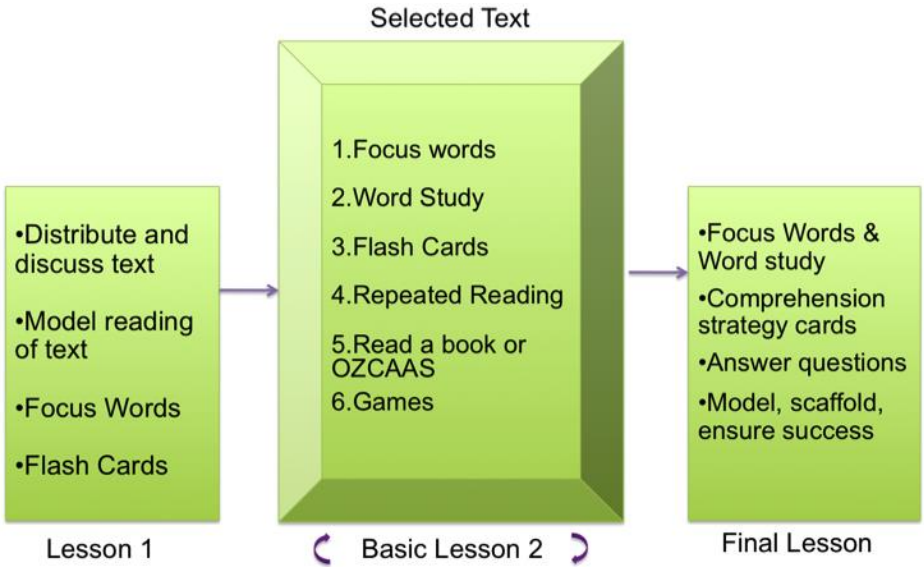


Figure 1: Literacy lesson structures

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) Comprehension Level 1; (4) Level 2 Words; (5) Comprehension 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.

For all tests in this study (OZCAAS, PATM, and VCAA) the comparison group represents average-achieving students picked from the same class as *QuickSmart* students. The comparison students did the pre-intervention and post-intervention tests but did not receive any *QuickSmart* instruction. It is important to note that the comparison students do not represent a 'true' control group because they do not have the same starting points as 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 would be ethically problematic since this would deprive a selected group of low-achieving students of the educational benefits that other low-achieving students in the same class 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 highly likely that the *QuickSmart* students would show an even greater margin of improvement relative to that of the 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 practitioners are sharing *QuickSmart* resources and activities throughout the school. Our information from school reports is that a majority of Principals have begun this process in their school within the first two years of *QuickSmart* implementation. 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* in their classrooms, and consequently their scores are higher at post-test because of this exposure.

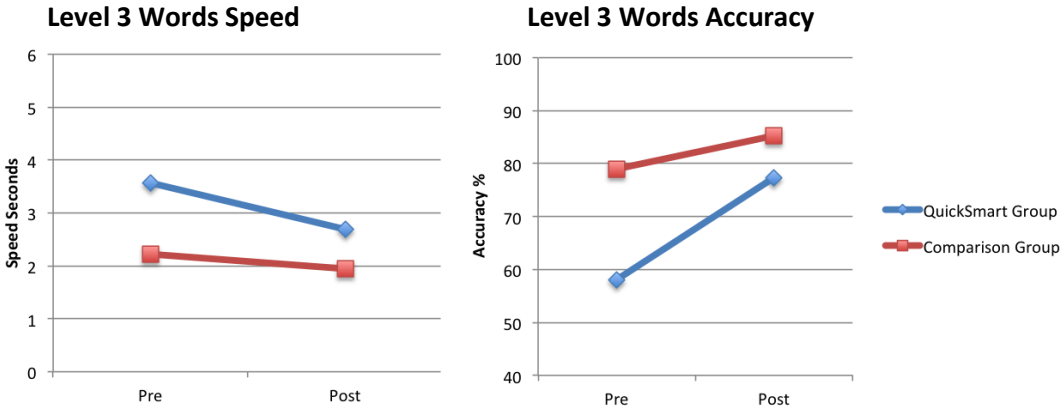
In order to obtain the difference between the improvement of *QuickSmart* students and comparison students we analysed the data using paired-samples *t*-tests. To protect against the cascading Type I error associated with multiple *t*-tests we lowered the significance level from the customary 0.05 to 0.01. [The reason for this is, if the tests were to be repeated many times, on average in the longer run, the decision that the means 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. This is the case for the results of our analyses 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.

3.1.1 Combined OZCAAS Analysis

3.1.1.1 Level 3 Words

Table 1: OZCAAS Level 3 Words results - all students 2012

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Level 3 Words *QS* (speed secs)	559	3.573	2.469	2.687	2.262	-0.886	<0.001*	-0.374
Level 3 Words COMP (speed secs)	175	2.224	1.541	1.946	1.186	-0.278	0.003*	-0.202
Level 3 Words *QS* (accuracy %)	559	58.071	27.589	77.386	23.986	19.315	<0.001*	0.747
Level 3 Words COMP (accuracy %)	175	78.986	18.938	85.249	14.6	6.263	<0.001*	0.37



On the Level 3 Words test, there were paired data for 559 *QuickSmart* students and 175 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 0.886 seconds. The effect size for this result is -0.374, which indicates an appropriate 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.

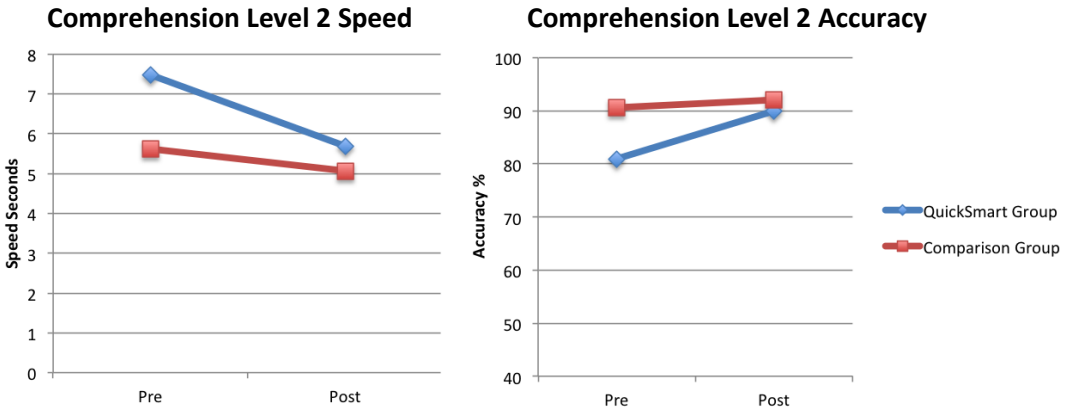
In terms of accuracy, the *QuickSmart* students' average scores have improved by over 19.3 percentage points, which is a very strong result. The effect size is 0.747, which indicates very strong improvement for the *QuickSmart* group.

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 in Level 3 words.

3.1.1.2 Comprehension Level 2

Table 2: OZCAAS Comprehension Level 2 - all students 2012

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Comprehension Level 2 *QS* (speed secs)	622	7.483	3.173	5.693	2.886	-1.79	<0.001*	-0.59
Comprehension Level 2 COMP (speed secs)	206	5.628	2.277	5.069	1.883	-0.559	<0.001*	-0.267
Comprehension Level 2 *QS* (accuracy %)	622	80.96	17.514	89.926	12.34	8.966	<0.001*	0.592
Comprehension Level 2 COMP (accuracy %)	206	90.537	9.97	92.036	8.306	1.499	0.038	0.163



On the Comprehension Level 2 test, there were paired data for 622 *QuickSmart* students and 206 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 1.79 seconds, which is a strong result. The effect size for this result is -0.59, which indicates strong improvement.

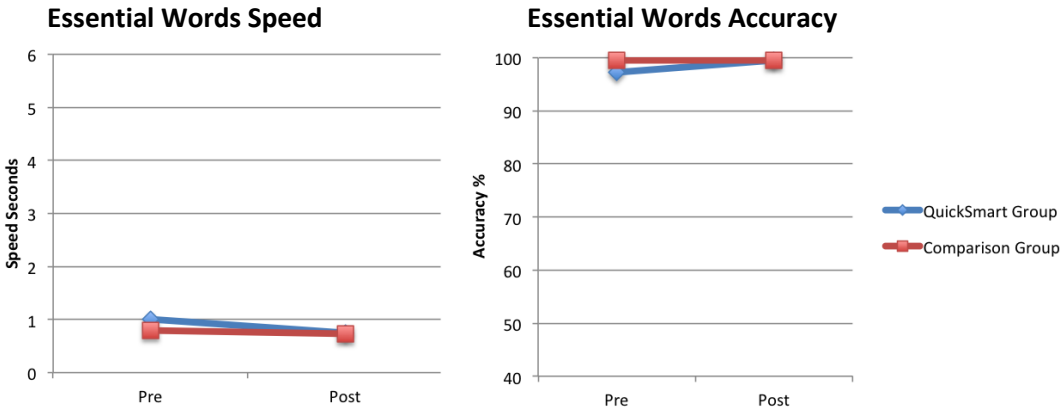
In terms of accuracy, the *QuickSmart* students' average scores have improved by more than 8.9 percentage points, which is a very strong result. The effect size is 0.592, which indicates strong improvement for the *QuickSmart* group.

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

3.1.1.3 Essential Words

Table 3: OZCAAS Essential Words - all students 2012

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Essential words QS (speed)	671	1.007	0.669	0.749	0.333	-0.257	<0.001*	-0.487
Essential words Comp (speed)	201	0.791	0.329	0.732	0.246	-0.059	0.008*	-0.204
Essential words QS (acc)	671	97.253	6.998	99.449	2.212	2.196	<0.001*	0.423
Essential words Comp (acc)	201	99.492	1.662	99.575	1.802	0.083	0.611	0.048

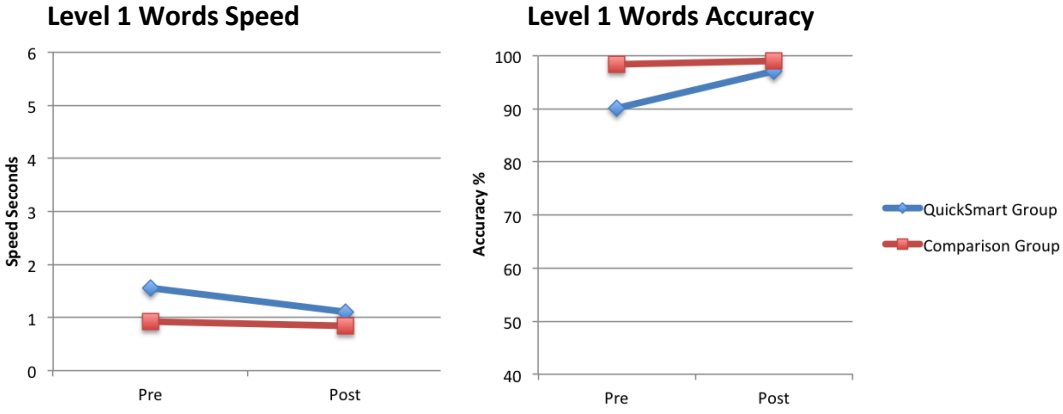


The results for Essential Words, the most commonly used words that should be known by middle school students, indicate a stronger improvement for the *QuickSmart* students. However, the accuracy results show a strong ceiling effect as the results were already at a high level at pre-test for both groups.

3.1.1.4 Level 1 Words

Table 4: OZCAAS Level 1 Words - all students 2012

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Level 1 Words QS (speed secs)	723	1.563	1.285	1.107	1.16	-0.456	<0.001*	-0.373
Level 1 Words COMP (speed secs)	212	0.927	0.382	0.843	0.313	-0.084	0.002*	-0.239
Level 1 Words QS (accuracy %)	723	90.075	15.121	97.17	7.673	7.095	<0.001*	0.592
Level 1 Words COMP (acc %)	212	98.391	4.016	99.097	2.483	0.706	0.003*	0.211

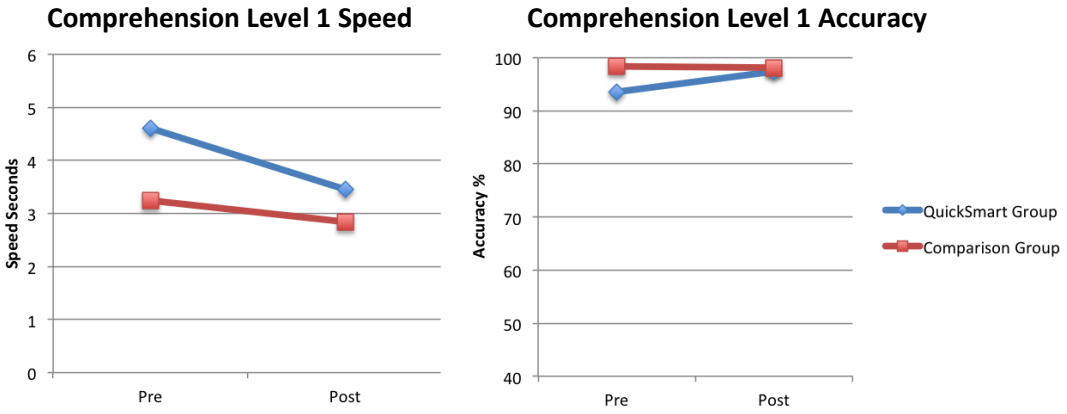


The results for Level 1 Words indicate a strong improvement for the *QuickSmart* students. The diagrams illustrate the narrowing of the gap between the *QuickSmart* students and comparison students.

3.1.1.5 Comprehension Level 1

Table 5: OZCAAS Comprehension Level 1 - all students 2012

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Comprehension Level 1 QS (speed secs)	684	4.607	2.281	3.453	1.755	-1.154	<0.001*	-0.567
Comprehension Level 1 COMP (speed secs)	213	3.249	1.146	2.841	0.901	-0.407	<0.001*	-0.395
Comprehension Level 1 QS (accuracy %)	684	93.568	11.024	97.38	6.425	3.812	<0.001*	0.423
Comprehension Level 1 COMP (accuracy %)	213	98.398	3.388	98.143	4.213	-0.255	0.457	-0.067



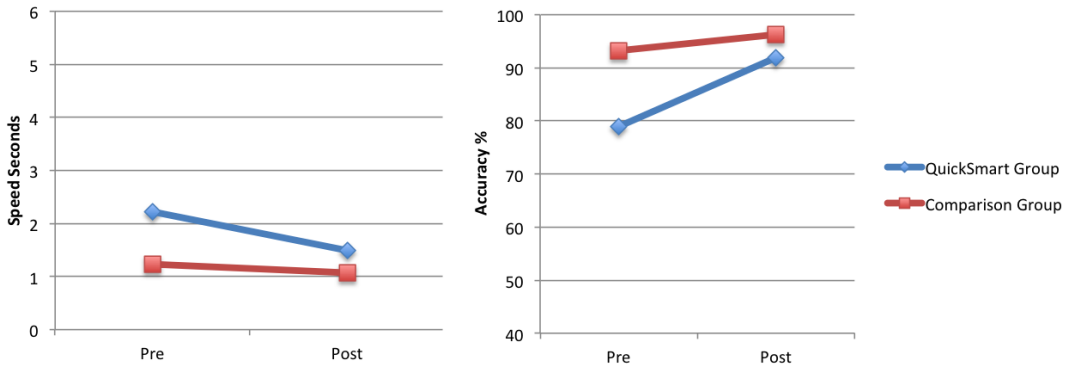
The results for Comprehension Level 1 indicate a strong improvement for the *QuickSmart* students. The diagrams illustrate the narrowing of the gap between the *QuickSmart* students and comparison students. The accuracy results for the comparison group show a strong ceiling effect.

3.1.1.6 Level 2 Words

Table 6: OZCAAS Level 2 Words - all students 2012

CAAS Operation	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Level 2 Words *QS* (speed secs)	683	2.223	1.801	1.487	1.353	-0.736	<0.001*	-0.462
Level 2 Words COMP (speed secs)	202	1.227	0.638	1.071	0.574	-0.156	<0.001*	-0.258
Level 2 Words *QS* (accuracy %)	683	78.86	21.494	91.988	13.378	13.129	<0.001*	0.733
Level 2 Words COMP (acc %)	202	93.239	9.187	96.322	5.474	3.084	<0.001*	0.408

Level 2 Words Speed **Level 2 Words Accuracy**



The results for Level 2 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 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 2012

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (speed)	367	1.031	0.786	0.742	0.325	-0.289	<0.001*	-0.48
Male COMP (speed)	92	0.826	0.39	0.75	0.275	-0.075	0.049	-0.223
Female QS (speed)	304	0.978	0.491	0.758	0.342	-0.22	<0.001*	-0.519
Female COMP (speed)	109	0.761	0.265	0.716	0.219	-0.045	0.075	-0.187
Male QS (accuracy)	367	96.988	7.945	99.384	2.498	2.396	<0.001*	0.407
Male COMP (accuracy)	92	99.533	1.523	99.598	1.954	0.065	0.798	0.037
Female QS (accuracy)	304	97.573	5.645	99.526	1.807	1.953	<0.001*	0.466
Female COMP (accuracy)	109	99.458	1.777	99.555	1.671	0.097	0.644	0.056

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.

3.1.2.2 Level 1 Words by Gender

Table 8: OZCAAS Level 1 Words results – all students by gender 2012

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (speed)	391	1.52	1.267	1.103	1.223	-0.417	<0.001*	-0.335
Male COMP (speed)	96	0.927	0.327	0.836	0.33	-0.092	0.008	-0.279
Female QS (speed)	332	1.615	1.305	1.112	1.083	-0.503	<0.001*	-0.419
Female COMP (speed)	116	0.926	0.424	0.849	0.299	-0.077	0.063	-0.21
Male QS (accuracy)	391	89.64	15.598	96.616	9.194	6.976	<0.001*	0.545
Male COMP (accuracy)	96	98.662	3.301	99.175	2.351	0.513	0.049	0.179
Female QS (accuracy)	332	90.587	14.545	97.823	5.296	7.236	<0.001*	0.661
Female COMP (accuracy)	116	98.167	4.526	99.032	2.595	0.865	0.022	0.234

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

3.1.2.3 Comprehension Level 1 by Gender

Table 9: OZCAAS Comprehension Level 1 results – all students by gender 2012

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (speed)	370	4.7	2.314	3.442	1.764	-1.258	<0.001*	-0.611
Male COMP (speed)	96	3.289	1.218	2.859	0.862	-0.43	0.001	-0.408
Female QS (speed)	314	4.497	2.24	3.467	1.745	-1.031	<0.001*	-0.513
Female COMP (speed)	117	3.215	1.087	2.827	0.935	-0.388	<0.001*	-0.383
Male QS (accuracy)	370	93.305	10.533	97.175	6.149	3.87	<0.001*	0.449
Male COMP (accuracy)	96	98.179	3.574	98.096	3.629	-0.083	0.867	-0.023
Female QS (accuracy)	314	93.878	11.584	97.621	6.738	3.743	<0.001*	0.395
Female COMP (accuracy)	117	98.577	3.233	98.181	4.654	-0.396	0.406	-0.099

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

3.1.2.4 Level 2 Words by Gender

Table 10: OZCAAS Level 2 Words results – all students by gender 2012

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (speed)	371	2.163	1.754	1.424	1.323	-0.739	<0.001*	-0.476
Male COMP (speed)	91	1.161	0.547	1.068	0.689	-0.093	0.127	-0.149
Female QS (speed)	312	2.295	1.856	1.563	1.387	-0.732	<0.001*	-0.447
Female COMP (speed)	111	1.282	0.702	1.074	0.463	-0.209	<0.001*	-0.351
Male QS (accuracy)	371	78.558	21.698	91.795	13.808	13.237	<0.001*	0.728
Male COMP (accuracy)	91	94.1	9.336	96.933	5.164	2.833	<0.001*	0.376
Female QS (accuracy)	312	79.219	21.279	92.219	12.867	13.0	<0.001*	0.739
Female COMP (accuracy)	111	92.532	9.045	95.822	5.69	3.289	<0.001*	0.435

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

3.1.2.5 Comprehension Level 2 by Gender

Table 11: OZCAAS Comprehension Level 2 results – all students by gender 2012

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (speed)	338	7.687	3.29	5.654	2.893	-2.033	<0.001*	-0.656
Male COMP (speed)	94	5.401	2.236	4.945	1.704	-0.455	0.018	-0.229
Female QS (speed)	284	7.24	3.015	5.74	2.882	-1.5	<0.001*	-0.509
Female COMP (speed)	112	5.818	2.303	5.172	2.022	-0.646	<0.001*	-0.298
Male QS (accuracy)	338	80.349	17.792	89.881	11.932	9.532	<0.001*	0.629
Male COMP (accuracy)	94	91.11	9.59	91.837	8.337	0.727	0.481	0.081
Female QS (accuracy)	284	81.686	17.181	89.98	12.828	8.294	<0.001*	0.547
Female COMP (accuracy)	112	90.057	10.295	92.203	8.314	2.146	0.034	0.229

The results of *QuickSmart* students show that in 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 2012

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (speed)	314	3.466	2.427	2.728	2.423	-0.738	<0.001*	-0.304
Male COMP (speed)	78	1.912	1.129	1.778	0.909	-0.134	0.25	-0.131
Female QS (speed)	245	3.71	2.52	2.634	2.043	-1.076	<0.001*	-0.469
Female COMP (speed)	97	2.475	1.772	2.08	1.359	-0.395	0.005	-0.25
Male QS (accuracy)	314	57.563	27.784	76.655	24.462	19.092	<0.001*	0.729
Male COMP (accuracy)	78	82.612	17.309	87.559	12.902	4.947	0.001	0.324
Female QS (accuracy)	245	58.723	27.381	78.323	23.379	19.6	<0.001*	0.77
Female COMP (accuracy)	97	76.07	19.76	83.392	15.653	7.322	<0.001*	0.411

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

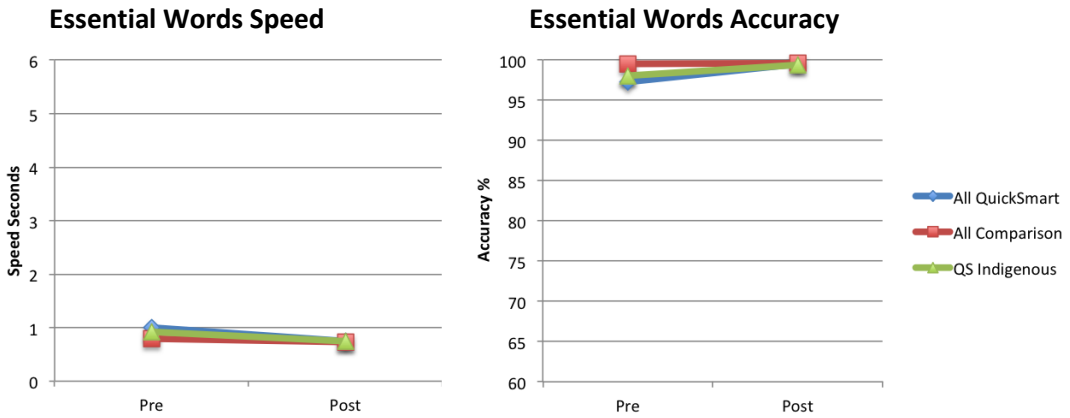
3.1.2.7 Indigenous students

Table 13: OZCAAS results - Indigenous students 2012

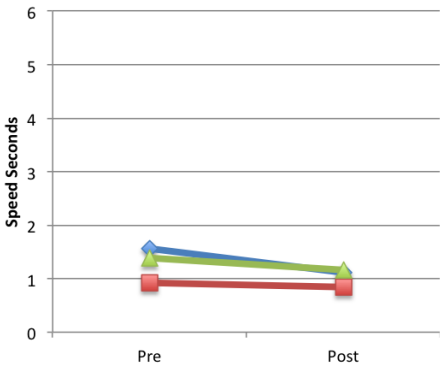
Test	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Essential words QS (speed)	66	0.922	0.351	0.741	0.399	-0.18	<0.001*	-0.48
Essential words QS (acc)	66	98.023	5.124	99.352	2.57	1.329	0.009	0.328
Level 1 words QS (speed)	71	1.388	1.062	1.155	1.783	-0.233	0.088	-0.159
Level 1 words QS (acc)	71	92.014	15.067	96.538	9.391	4.525	<0.001*	0.36
Comprehension Level 1 QS (speed)	66	4.293	1.694	3.639	1.624	-0.654	<0.001*	-0.394
Comprehension Level 1 QS (acc)	66	94.055	11.859	96.624	8.422	2.569	0.034	0.25
Level 2 words QS (speed)	70	2.204	1.648	1.562	1.366	-0.642	<0.001*	-0.424
Level 2 words QS (acc)	70	81.421	23.534	90.614	17.088	9.193	<0.001*	0.447
Comprehension Level 2 QS (speed)	64	7.912	3.136	6.055	2.786	-1.858	<0.001*	-0.626
Comprehension Level 2 QS (acc)	64	83.155	18.112	90.052	12.611	6.897	<0.001*	0.442
Level 3 words QS (speed)	58	3.833	2.592	2.951	2.174	-0.882	0.003	-0.369
Level 3 words QS (acc)	58	64.963	30.029	76.172	28.987	11.21	<0.001*	0.38

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.

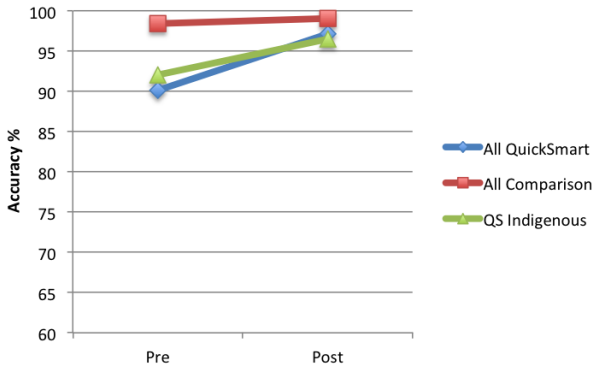
The following graphs illustrate how the Indigenous students (green) have performed in each test compared to the whole *QuickSmart* group (blue) as well as the comparison students (red).



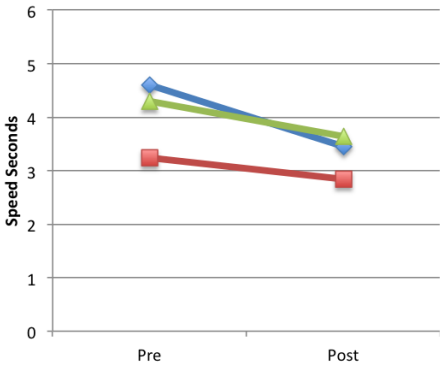
Level 1 Words Speed



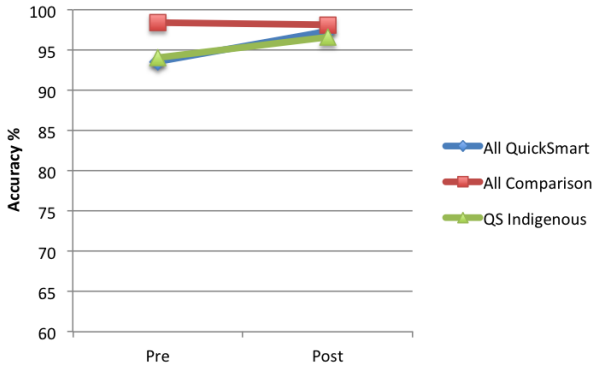
Level 1 Words Accuracy



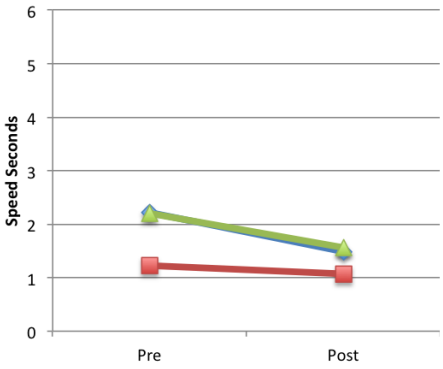
Comprehension Level 1 Speed



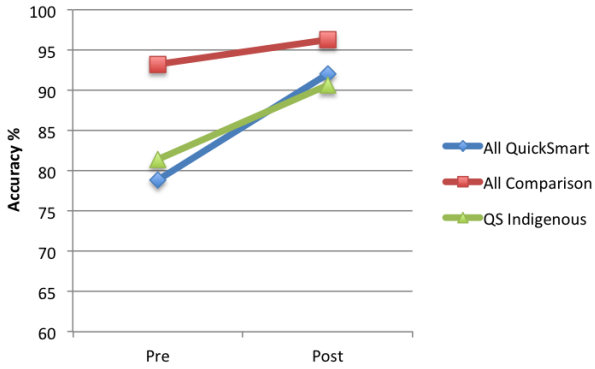
Comprehension Level 1 Accuracy



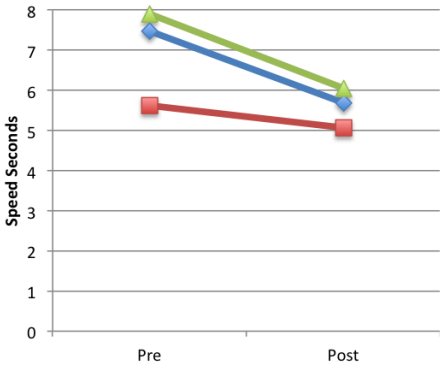
Level 2 Words Speed



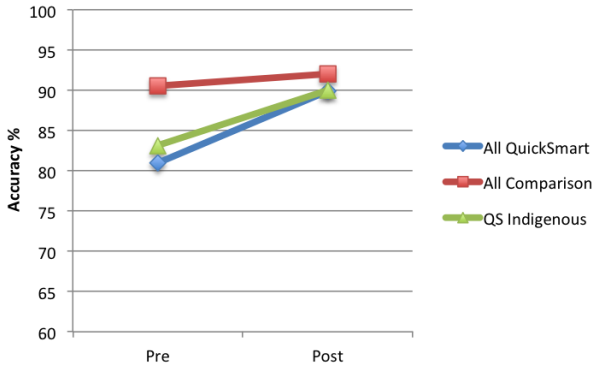
Level 2 Words Accuracy

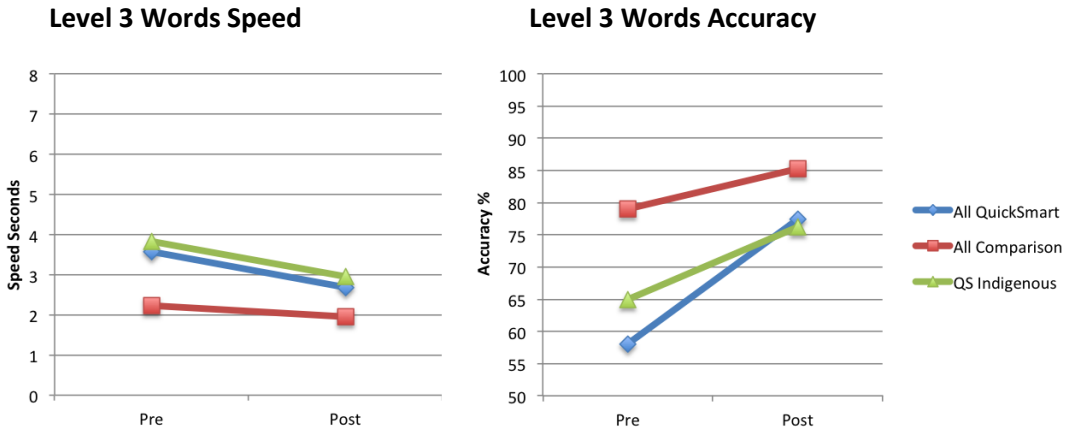


Comprehension Level 2 Speed



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 73 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 - 2012

	N	Mean	Std. Deviation
Essential words QS (speed)	30	0.664	0.224
Essential words QS (acc)	30	99.813	1.022
Level 1 words QS (speed)	29	0.866	0.55
Level 1 words QS (acc)	29	96.886	8.966
Comprehension Level 1 QS (speed)	32	3.184	1.801
Comprehension Level 1 QS (acc)	32	96.981	5.821
Level 2 words QS (speed)	58	2.406	2.54
Level 2 words QS (acc)	58	83.961	20.482
Comprehension Level 2 QS (speed)	56	6.176	3.681
Comprehension Level 2 QS (acc)	56	84.3	13.838
Level 3 words QS (speed)	73	3.9	2.408
Level 3 words QS (acc)	73	55.868	22.012

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 Essential words and Level 1 words, the average response rates were below one second and accuracy results close to the goal of 100%. In Level 2 words, the average response rates were within a second of the goal range and accuracy above 83%. In Comprehension Level 1, the average response rates were within the goal range, and accuracy above 96%. 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 seconds and accuracy over 55% 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 the Vocabulary tests for speed and accuracy. These differences, however, are too small to warrant further investigation.

Indigenous students had lower finishing points on some assessments 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 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 to indicate the magnitude of the change in academic achievement for the *QuickSmart* and comparison students.

Table 15: PAT results - (Scale scores) 2012

Group	Students with paired data	Average Gain score	Significance	Effect size
All *QuickSmart* Vocabulary	**560**	**6.15**	**<0.001***	**0.573**
All Comparison Vocabulary	**187**	**3.369**	**<0.001***	**0.35**
All *QuickSmart* Comprehension	**630**	**5.729**	**<0.001***	**0.555**
All Comparison Comprehension	**193**	**4.661**	**<0.001***	**0.429**

The results indicate a very strong improvement for *QuickSmart* students in both Vocabulary and 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 7 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) 2012

Gender	Students with paired data	Average Gain score	Significance	Effect size
Vocabulary – QS Male	295	6.102	<0.001*	0.579
Vocabulary – Comp Male	87	2.755	<0.001*	0.294
Vocabulary – QS Female	265	6.205	<0.001*	0.566
Vocabulary – Comp Female	100	3.904	<0.001*	0.399
Comprehension – QS Male	330	5.514	<0.001*	0.525
Comprehension – Comp Male	85	2.666	0.006*	0.249
Comprehension – QS Female	300	5.966	<0.001*	0.588
Comprehension – Comp Female	108	6.232	<0.001*	0.568

The results indicate that female *QuickSmart* students improved slightly more 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) 2012

Group	Students with paired data	Average Gain score	Significance	Effect size
Indigenous QS Vocab	48	5.035	<0.001*	0.43
All QS Comparison Vocab	560	6.15	<0.001*	0.573
Indig QS Comprehension	51	5.557	<0.001*	0.608
All QS Comparison Comprehension	630	5.729	<0.001*	0.555

Once again these results show strong improvement for the Indigenous students who participated in *QuickSmart* for Comprehension. 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' Vocabulary results also show a strong improvement, although not as strong as that shown by the rest of the *QuickSmart* group. Their rate of growth was in excess of that achieved by the comparison group for Vocabulary.

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) 2012

	Students with paired data	**Average Gain score**	**Significance**	**Effect size**
All schools – QS group	**29**	**0.545**	**0.001***	**0.65**
All schools – Comp group	**18**	**0.111**	**0.698**	**0.127**

The results are encouraging. *QuickSmart* students showed an average growth of over 12 months over the course of the intervention and a very strong improvement measured by Effect Size statistics. This is impressive in light of the fact that 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.

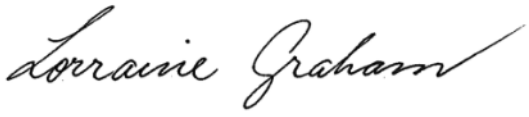
4 Conclusion to Report

The support provided by the Schools and Clusters has been critical in making more positive the hopes and aspirations of more than 880 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 *QuickSmar*t 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 – Independent Assessment Results

5.1 Standardised Test results by Region – (Scale scores for PAT, VELS levels for VCAA On-Demand Tests) 2012

Cluster of Schools		Pre-Intervention		Post-Intervention				
	N	Mean	SD	Mean	SD	Gain	p	Effect size
Adelaide Vocab - QS Group	55	108.218	9.633	113.425	11.503	5.207	<0.001*	0.491
Adelaide Comprehension - QS Group	106	113.078	8.95	117.228	11.06	4.15	<0.001*	0.413
Ballarat Vocab - QS Group	12	114.983	7.225	118.558	6.226	3.575	0.093	0.53
Ballarat Comprehension - QS Group	12	117.108	5.616	128.108	11.052	11.0	0.002*	1.255
Horsham Vocab - QS Group	88	114.933	7.756	120.834	8.571	5.901	<0.001*	0.722
Horsham Comprehension - QS Group	92	117.375	7.36	124.488	9.57	7.113	<0.001*	0.833
Hunter Vocab - QS Group	43	118.509	8.495	123.974	8.506	5.465	<0.001*	0.643
Hunter Comprehension - QS Group	43	122.251	9.018	127.835	9.018	5.584	<0.001*	0.619
Melbourne Vocab - QS Group	189	108.193	9.394	115.007	9.72	6.814	<0.001*	0.713
Melbourne Comprehension - QS Group	184	110.112	9.597	115.82	12.064	5.708	<0.001*	0.524
North Coast NSW Vocab - QS Group	65	108.905	12.05	118.902	15.356	9.997	<0.001*	0.724
North Coast NSW Comprehension - QS Group	93	113.531	8.203	119.754	9.151	6.223	<0.001*	0.716
North West NSW Vocab - QS Group	70	118.256	10.923	122.276	10.905	4.02	<0.001*	0.368
North West NSW Comprehension - QS Group	62	117.0	9.676	121.748	8.052	4.748	0.004*	0.533
Tasmania Vocab - QS Group	38	107.721	7.877	111.45	7.871	3.729	0.002*	0.474
Tasmania Comprehension - QS Group	38	110.968	8.595	116.75	9.97	5.782	<0.001*	0.621
#Vic VCAA QS Group	29	2.728	0.886	3.272	0.788	0.545	0.001*	0.65
#Vic VCAA Comp Group	18	4.45	0.763	4.561	0.974	0.111	0.698	0.127

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

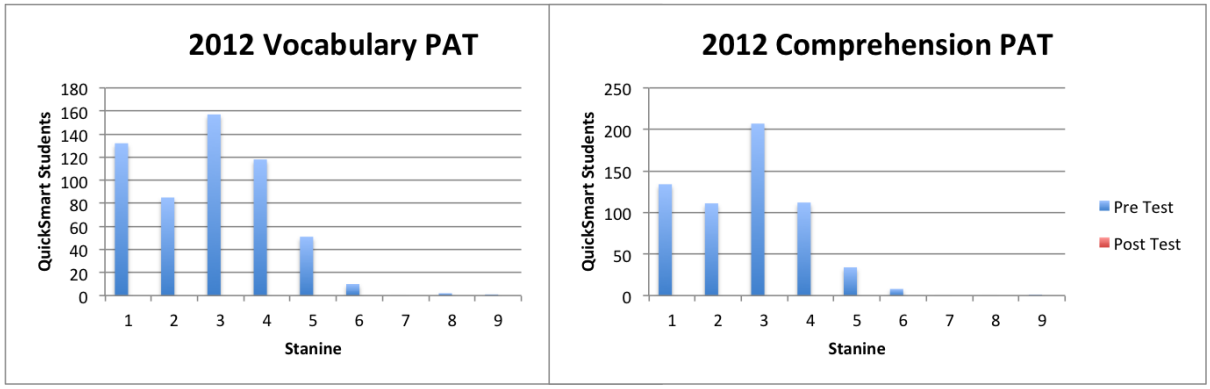
Note 2: some results for Victoria (#) are for the VCAA test, all others are PAT test.

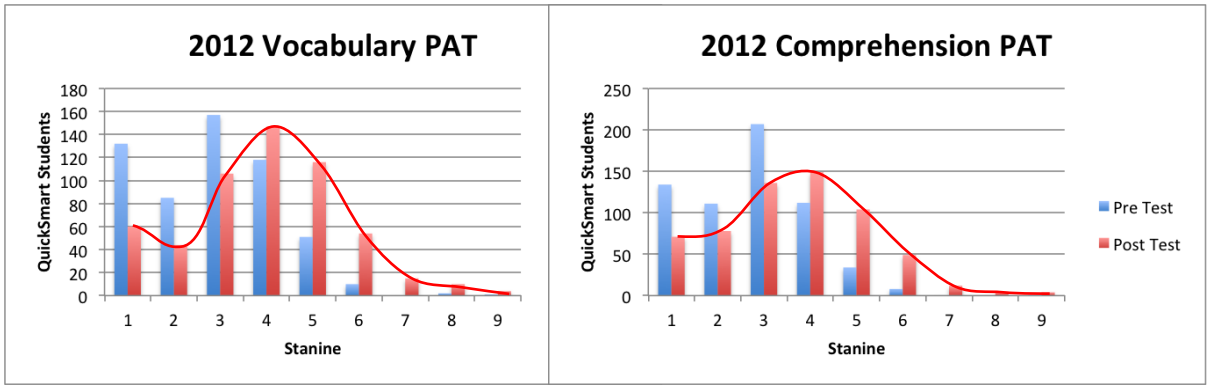
5.2 PAT results – by demographic (Scale scores) 2012

Demographic		Pre-Intervention		Post-Intervention				
	N	Mean	SD	Mean	SD	Gain	*p*	Effect size
All Schools Vocabulary – QS Group	**560**	**111.501**	**10.394**	**117.651**	**11.057**	**6.15**	**<0.001***	**0.573**
All Schools Vocabulary – Comp Group	**187**	**123.253**	**10.228**	**126.622**	**8.981**	**3.369**	**<0.001***	**0.35**
All Schools Comprehension – QS Group	**630**	**113.868**	**9.475**	**119.597**	**11.116**	**5.729**	**<0.001***	**0.555**
All Schools Comprehension – Comp Group	**193**	**125.873**	**10.413**	**130.534**	**11.293**	**4.661**	**<0.001***	**0.429**
Vocabulary – QS Indigenous	48	111.894	10.776	116.929	12.591	5.035	<0.001*	0.43
Comprehension – QS Indigenous	51	113.112	8.893	118.669	9.381	5.557	<0.001*	0.608
Vocabulary – QS Male	295	111.781	10.358	117.883	10.702	6.102	<0.001*	0.579
Vocabulary – Comp Male	87	124.662	9.775	127.417	8.918	2.755	<0.001*	0.294
Vocabulary – QS Female	265	111.189	10.445	117.394	11.453	6.205	<0.001*	0.566
Vocabulary – Comp Female	100	122.027	10.502	125.931	9.023	3.904	<0.001*	0.399
Comprehension – QS Male	330	114.22	9.741	119.734	11.203	5.514	<0.001*	0.525
Comprehension – Comp Male	85	126.862	10.28	129.528	11.098	2.666	0.006*	0.249
Comprehension – QS Female	300	113.48	9.175	119.446	11.035	5.966	<0.001*	0.588
Comprehension – Comp Female	108	125.094	10.498	131.326	11.433	6.232	<0.001*	0.568

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 2012





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 higher77-88% 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 PAT tests.