quicksmart

Annual Literacy Program Report

2020

The SiMERR National Research Centre
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Acknowledgements

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1 *QuickSmart* Executive Summary in 2020

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 under-utilised, 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, Indigenous teaching assistants (trained 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 replicability (including quality assurance) across all regions of Australia.

The analyses presented in this report provide information about students' performance in the QuickSmart Literacy program. In particular, the focus here is on the Cognitive Aptitude Assessment System, Australian version (OZCAAS) and on standardised test measures, specifically the Progressive Achievement Tests in Vocabulary (V) and Comprehension (C) (ACER, 2008). Some schools provided data for other independent tests, however, there was insufficient use of these tests for inclusion in this report. Further investigation of the data provided in this report examines the results in terms of gender and for participating Indigenous students.

In 2020, the *QuickSmart* team at the University of New England received matched data from 801 students who participated in *QuickSmart* Literacy lessons and 150 average-achieving comparison peers. These students were drawn from schools from 17 regions around Australia.

The global COVID-19 pandemic in 2020 resulted in schools conducting lessons online for the majority of students for a period of time. Many schools were unable to run *QuickSmart* lessons with their students during this period. Some schools were able to adapt a portion of their *QuickSmart* lesson to an online format using Zoom or a similar online meeting tool, but this appears to have been mostly for practice components. As a result fewer students participated in *QuickSmart* during the year and also fewer students were able to complete the recommended number of *QuickSmart* lessons normally done within the year. Despite the challenges schools faced in providing *QuickSmart* lessons to their struggling students with the disrupted year in 2020, the results achieved are similar to those from previous years, but for a smaller number of students.

In terms of the OZCAAS (a computer-generated, random letter and word testing approach that measures the reaction time (speed) and the accuracy of basic reading skills) the results for word

recognition and sentence-level comprehension indicate a strong to substantial improvement for the *QuickSmart* students in terms of accuracy and response time. The evidence provided illustrates that *QuickSmart* students narrowed the achievement gap between them and their average-achieving comparison group peers.

Such growth is a 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 but in most cases these results were not statistically significant. They were only significant for Level 3 Words accuracy. However, the small effect size indicates that this statistical finding is not meaningful for practical purposes.

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

A further mark of the success of *QuickSmart* can be found in the post-test results of those students who did not succeed in completing the pre-test. In such cases, (see Table 14) Instructors are advised not to continue collecting data in the pre-test as doing so would confront these students with the extent of their weaknesses at the beginning of the program. Significantly, the fact that these students are now able to complete all OZCAAS assessments at the end of the program is an achievement in and of itself.

In Essential Words and Level 1 Words, the average response rate at the end of the program was below 2.2 seconds, with average accuracy above 78%. In Level 2 Words, the average response rate was below 3.7 seconds, with average accuracy above 77%.

In Sentence Understanding Level 1, the average response rate was below 6.1 seconds, with average accuracy above 94%. 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 times below 4.6 seconds and accuracy over 57% at post-test. It is likely that part of this improvement may be due to the fact that students:

1. 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; and
2. students have increased their ability to benefit from classroom instruction.

In the case of the ACER PAT-V and PAT-C tests, norm tables were used to convert raw scores from various forms of the PAT to consistent scaled 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 Tests. These improvements are greater than those recorded for the comparison group of average-achieving peers.

In terms of scaled scores, the results indicate that female *QuickSmart* students improved more than male *QuickSmart* students in Vocabulary and male *QuickSmart* students improved more in Comprehension. The independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level (p = 0.174 for vocabulary and 0.398 for comprehension).

In the case of Indigenous students who participated in *QuickSmart*, the results show a strong improvement in Vocabulary and a substantial improvement in Comprehension. These students were able to report a rate of growth in excess of that achieved by the comparison group. In Comprehension the Indigenous students improved more than the overall *QuickSmart* 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. Strong to substantial 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. 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 many tens of 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 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 time and *smart* in their understanding and 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 through targeted practice; 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 a selected text for developing basic reading skills.

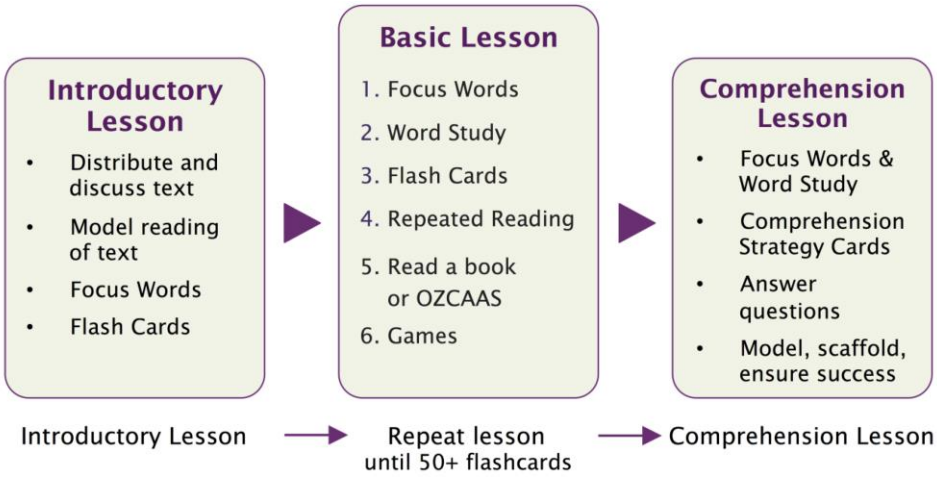


Figure 1: *QuickSmart* Literacy lesson structures

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.

The program is designed to be run for 90 lessons across the school year.

2.2.1 Impact of COVID-19 on *QuickSmart* in 2020

The global COVID-19 pandemic in 2020 resulted in schools conducting lessons online for the majority of students for a period of time. Many schools were unable to run *QuickSmart* lessons with their students during this period. Some schools were able to adapt a portion of their *QuickSmart* lesson to an online format using Zoom or a similar online meeting tool, but this appears to have been mostly for practice components. Consequently, fewer students participated fully in *QuickSmart* during the year and also fewer students had the opportunity to complete the recommended number of *QuickSmart* lessons normally done within the year.

In addition to the impact of online lessons, the timing of the lockdown resulted in a number of schools new to the program not being able to start their *QuickSmart* year. The reason for this was that the lockdown happened soon after their training, while they were only beginning to identify and pre-test students. Some of these schools decided to only do enough *QuickSmart* in 2020 to practice their lessons with a view to fully activate in 2021, and so did not provide data for this report. Other schools chose to halt their implementation of the program and restart the following year.

Despite the challenges schools faced in providing *QuickSmart* lessons to their struggling students with the disrupted year in 2020, the results achieved are similar to those from previous years, but for a smaller number of students.

3 *QuickSmart* Tests – 2020

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 response time and accuracy data from OZCAAS measures. These are related to word recognition and sentence 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 a primary focus of the *QuickSmart* lessons.

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

The vocabulary tests were:

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

The comprehension tests were:

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

The second set of analyses concern the results of independent tests. Most schools have utilised the Progressive Achievement Test (PAT) assessments in Vocabulary (V) and Reading Comprehension (C) for this purpose. These are standardised tests developed by the Australian Council for Education Research (ACER). PAT-V and PAT-C tests are independent tests taken prior to commencement of *QuickSmart* and at the completion of the program. Students' PAT results provide information about how the knowledge, skills and attitudes developed in *QuickSmart* are used and how they transfer to other broad areas of reading skill, which are not the 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, 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-group instruction. It is important to note that the comparison students do not represent an experimental 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, an experimental design with a control group would not be appropriate and could be ethically problematic since this would potentially deprive a selected group of low-achieving students of the educational benefits that other low-achieving students, (often) in the same class would receive. Thus, even though the results in this report consistently show that the *QuickSmart* students improve more than the comparison students, it has to be borne in mind that, if the comparison group consisted of low-achieving students, it is most likely that the *QuickSmart* students would show a greater margin of improvement relative to that group 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 2020, the *QuickSmart* team at the University of New England received data from 801 students who participated in *QuickSmart* Literacy lessons and 150 'average-achieving' comparison peers. These students were drawn from schools from 17 regions around Australia.

To assist with interpretation of these results, Level 3 Words and Sentence Understanding Level 2 are shown first, as these tests show the effect of the program most clearly. It is important to note that interpretation of results in some tests (e.g., Essential Words) can be impacted by a 'ceiling effect' as many students record strong results 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.

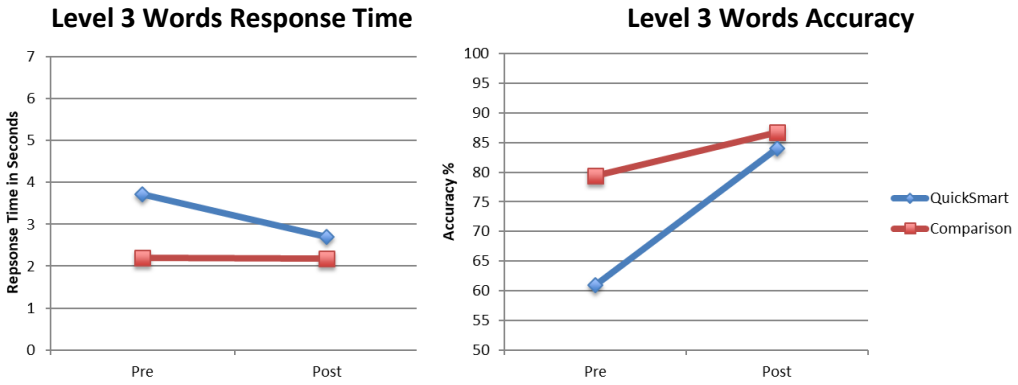
4.2 Combined OZCAAS Analysis

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 2020

Level 3 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	3.724	2.409	2.709	2.091	-1.015	<0.001*	0.45
Res Time (secs) Comp	2.209	1.126	2.188	1.53	-0.021	0.859	0.015
Accuracy (%) QS	60.886	24.357	84.037	20.113	23.151	<0.001*	1.037
Accuracy (%) Comp	79.386	20.473	86.681	15.468	7.295	<0.001*	0.402



On the Level 3 Words test, there were paired data for 705 *QuickSmart* students and 143 comparison students. The desired criterion for response time 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 1.015 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 0.45, 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 two-to-three years' growth.

In terms of accuracy, the *QuickSmart* students' average scores have improved by over 23 percentage points, which is a very strong result. The effect size of 1.037, indicates a substantial improvement for the *QuickSmart* group.

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

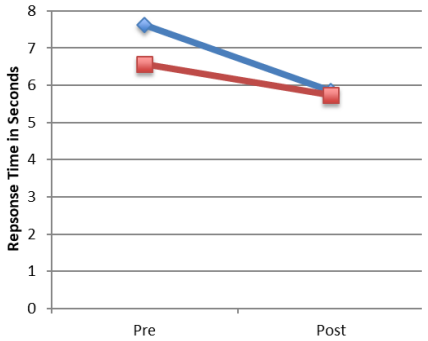
4.2.2 Sentence Understanding Level 2

Table 2 summarises the data submitted for OZCAAS for Sentence Understanding Level 2.

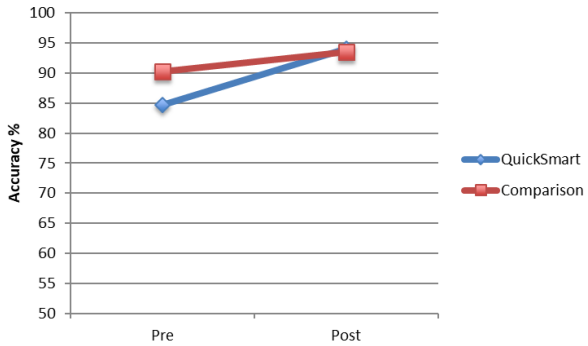
Table 2: OZCAAS Sentence Understanding Level 2 – all students 2020

Sentence Understanding Level 2	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	7.624	3.107	5.852	2.555	-1.772	<0.001*	0.623
Res Time (secs) Comp	6.578	2.263	5.734	1.876	-0.844	<0.001*	0.406
Accuracy (%) QS	84.646	14.099	94.091	9.381	9.445	<0.001*	0.789
Accuracy (%) Comp	90.258	12.433	93.513	8.297	3.255	0.003	0.308

Sentence Understanding Level 2 Response Time



Sentence Understanding Level 2 Accuracy



On the Sentence Understanding Level 2 test, there were paired data for 727 *QuickSmart* students and 142 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 time 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 1.772 seconds, which is a strong result. The effect size for this result is 0.623, which indicates very strong improvement.

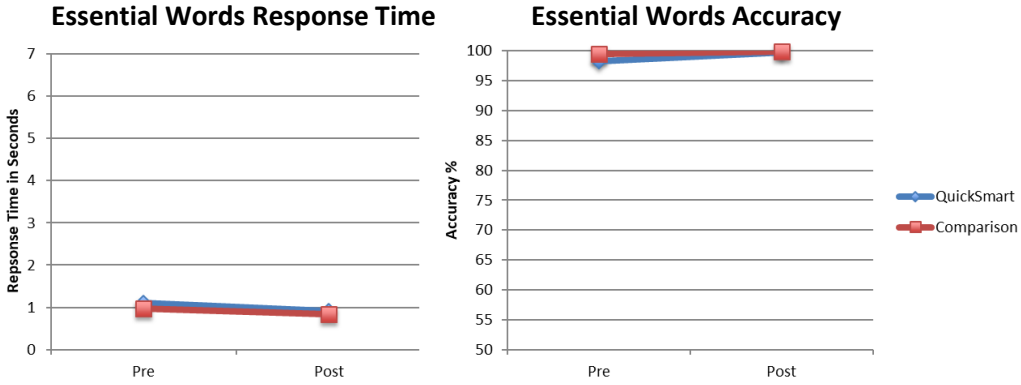
In terms of accuracy, the *QuickSmart* students' average scores have improved by more than 9 percentage points, which is a strong result. The effect size is 0.789, which indicates very strong improvement for the *QuickSmart* group.

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

4.2.3 Essential Words

Table 3: OZCAAS Essential Words – all students 2020

Essential Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Res Time (secs) QS	1.109	0.484	0.91	0.324	-0.199	<0.001*	0.484
Res Time (secs) Comp	0.969	0.391	0.839	0.278	-0.13	<0.001*	0.383
Accuracy (%) QS	98.325	5.264	99.751	1.46	1.426	<0.001*	0.369
Accuracy (%) Comp	99.552	1.865	99.832	0.946	0.28	0.097	0.189

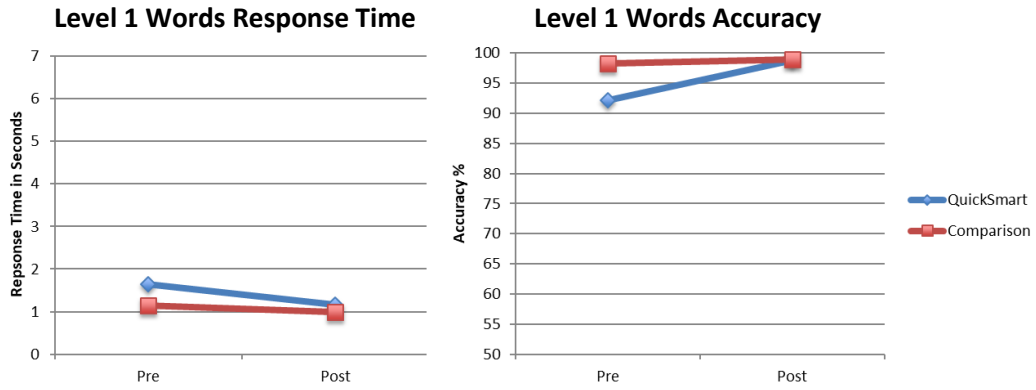


In summary, the results for Essential Words, the most commonly used words that should be known by middle school students, indicate a stronger improvement for the *QuickSmart* students than for the comparison students. However, both the response time and accuracy results show a strong ceiling effect as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

4.2.4 Level 1 Words

Table 4: OZCAAS Level 1 Words – all students 2020

Level 1 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	1.653	1.149	1.16	0.607	-0.493	<0.001*	0.537
Res Time (secs) Comp	1.137	0.466	0.988	0.415	-0.149	<0.001*	0.337
Accuracy (%) QS	92.182	12.758	98.843	3.91	6.661	<0.001*	0.706
Accuracy (%) Comp	98.248	4.179	98.972	3.8	0.724	0.039	0.181

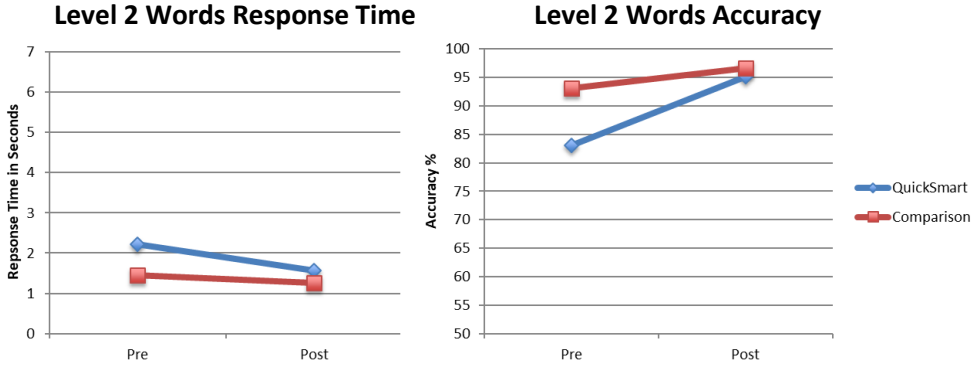


In summary, the results for Level 1 Words indicate a strong improvement for the *QuickSmart* students in response time and a very strong improvement in accuracy. The diagrams illustrate that as a result of the *QuickSmart* intervention, the *QuickSmart* students narrowed the gap to the comparison students in response time. In accuracy, they improved to such an extent that there was no substantial difference between them and the comparison students. However, both response time and accuracy results show a strong ceiling effect.

4.2.5 Level 2 Words

Table 5: OZCAAS Level 2 Words – all students 2020

Level 2 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	2.218	1.582	1.572	1.203	-0.646	<0.001*	0.46
Res Time (secs) Comp	1.449	0.835	1.262	0.73	-0.187	<0.001*	0.239
Accuracy (%) QS	83.002	18.253	95.167	10.149	12.165	<0.001*	0.824
Accuracy (%) Comp	93.162	9.701	96.702	8.572	3.54	<0.001*	0.387



The results for Level 2 Words indicate a strong improvement for the *QuickSmart* students in response time and a substantial improvement in accuracy. The diagrams illustrate that the

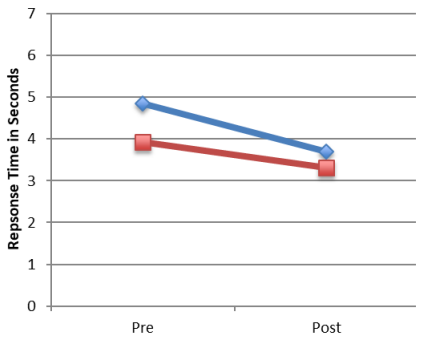
QuickSmart students narrowed the gap to the comparison students in both response time and accuracy.

4.2.6 Sentence Understanding Level 1

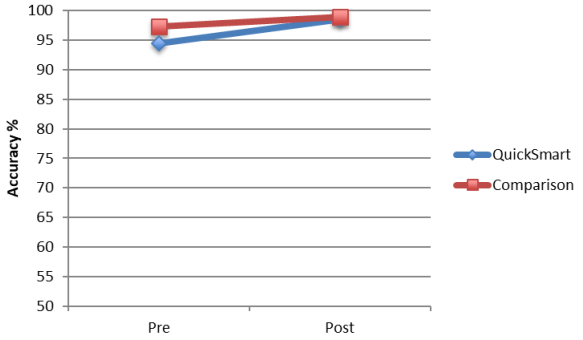
Table 6: OZCAAS Sentence Understanding Level 1 – all students 2020

Sentence Understanding Level 1	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	4.851	2.316	3.688	1.747	-1.163	<0.001*	0.567
Res Time (secs) Comp	3.92	1.224	3.311	0.996	-0.609	<0.001*	0.547
Accuracy (%) QS	94.52	10.837	98.535	4.416	4.015	<0.001*	0.485
Accuracy (%) Comp	97.258	5.972	98.952	3.01	1.694	0.001	0.358

Sentence Understanding Level 1 Response Time



Sentence Understanding Level 1 Accuracy



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

4.3 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 2020

Essential Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	1.149	0.54	0.915	0.311	-0.234	<0.001*	0.531
Male Comparison	0.978	0.405	0.84	0.242	-0.138	0.002	0.414
Female *QuickSmart*	1.061	0.401	0.904	0.339	-0.157	<0.001*	0.423
Female Comparison	0.957	0.376	0.837	0.32	-0.12	0.001*	0.344
Accuracy (%)							
Male *QuickSmart*	97.657	6.605	99.68	1.747	2.023	<0.001*	0.419
Male Comparison	99.697	1.258	99.926	0.625	0.229	0.083	0.231
Female *QuickSmart*	99.134	2.706	99.838	1.004	0.704	<0.001*	0.345
Female Comparison	99.372	2.417	99.716	1.23	0.344	0.318	0.179

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

4.3.2 Level 1 Words by Gender

Table 8: OZCAAS Level 1 Words results – all students by gender 2020

Level 1 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	1.677	1.135	1.164	0.635	-0.513	<0.001*	0.558
Male Comparison	1.163	0.415	1.008	0.381	-0.155	<0.001*	0.389
Female *QuickSmart*	1.626	1.167	1.156	0.572	-0.47	<0.001*	0.511
Female Comparison	1.106	0.524	0.964	0.456	-0.142	<0.001*	0.289
Accuracy (%)							
Male *QuickSmart*	91.438	14.194	98.792	4.02	7.354	<0.001*	0.705
Male Comparison	98.261	4.425	99.068	3.942	0.807	0.065	0.193
Female *QuickSmart*	93.05	10.8	98.902	3.782	5.852	<0.001*	0.723
Female Comparison	98.232	3.892	98.855	3.647	0.623	0.278	0.165

In summary, the results of *QuickSmart* students show that in both the response time 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 Level 2 Words by Gender

Table 9: OZCAAS Level 2 Words results – all students by gender 2020

Level 2 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	2.148	1.528	1.54	1.273	-0.608	<0.001*	0.432
Male Comparison	1.496	0.834	1.247	0.709	-0.249	<0.001*	0.322
Female *QuickSmart*	2.298	1.64	1.609	1.119	-0.689	<0.001*	0.491
Female Comparison	1.393	0.838	1.28	0.76	-0.113	0.06	0.141
Accuracy (%)							
Male *QuickSmart*	83.348	19.126	95.181	10.374	11.833	<0.001*	0.769
Male Comparison	92.966	10.406	97.065	8.396	4.099	<0.001*	0.434
Female *QuickSmart*	82.605	17.217	95.152	9.899	12.547	<0.001*	0.893
Female Comparison	93.396	8.857	96.269	8.82	2.873	0.002	0.325

In summary, the results of *QuickSmart* students show that in both the response time and accuracy the females have improved slightly more than the males. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.445$ for response time and 0.491 for accuracy).

4.3.4 Level 3 Words by Gender

Table 10: OZCAAS Level 3 Words results – all students by gender 2020

Level 3 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	3.454	2.121	2.497	1.868	-0.957	<0.001*	0.479
Male Comparison	2.182	0.996	2.154	1.625	-0.028	0.855	0.021
Female *QuickSmart*	4.046	2.68	2.961	2.307	-1.085	<0.001*	0.434
Female Comparison	2.242	1.275	2.231	1.415	-0.011	0.951	0.008
Accuracy (%)							
Male *QuickSmart*	62.599	24.84	84.427	20.537	21.828	<0.001*	0.958
Male Comparison	78.615	20.994	86.378	15.76	7.763	<0.001*	0.418
Female *QuickSmart*	58.848	23.646	83.574	19.618	24.726	<0.001*	1.138
Female Comparison	80.337	19.936	87.055	15.216	6.718	<0.001*	0.379

In summary, the results of *QuickSmart* students show that in both the response time and accuracy the females have improved more than the males. The results of independent samples *t*-tests of *QuickSmart* students show that in response time the differences are not statistically significant at the 0.01 significance level ($p = 0.458$) but they are significant in accuracy ($p = 0.042$). However, the small effect size for accuracy (Cohen's $d = 0.154$) indicates that this statistical finding is not meaningful for practical purposes.

4.3.5 Sentence Understanding Level 1 by Gender

Table 11: OZCAAS Sentence Understanding Level 1 results – all students by gender 2020

Sentence Understanding Level 1	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	4.983	2.328	3.687	1.712	-1.296	<0.001*	0.634
Male Comparison	4.018	1.102	3.334	1.019	-0.684	<0.001*	0.644
Female *QuickSmart*	4.701	2.297	3.688	1.788	-1.013	<0.001*	0.492
Female Comparison	3.798	1.361	3.281	0.973	-0.517	<0.001*	0.437
Accuracy (%)							
Male *QuickSmart*	94.539	11.124	98.665	4.149	4.126	<0.001*	0.491
Male Comparison	96.746	6.783	98.597	3.393	1.851	0.019	0.345
Female *QuickSmart*	94.498	10.519	98.388	4.703	3.89	<0.001*	0.477
Female Comparison	97.9	4.744	99.397	2.401	1.497	0.014	0.398

In summary, the results of *QuickSmart* students show that in both the response time 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 ($p = 0.069$ for response time and 0.762 for accuracy).

4.3.6 Sentence Understanding Level 2 by Gender

Table 12: OZCAAS Sentence Understanding Level 2 results – all students by gender 2020

Sentence Understanding Level 2	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	7.634	3.181	5.821	2.637	-1.813	<0.001*	0.621
Male Comparison	6.833	2.456	5.793	1.927	-1.04	<0.001*	0.471
Female *QuickSmart*	7.612	3.023	5.888	2.46	-1.724	<0.001*	0.626
Female Comparison	6.259	1.967	5.661	1.823	-0.598	0.003	0.315
Accuracy (%)							
Male *QuickSmart*	84.733	14.571	93.696	9.841	8.963	<0.001*	0.721
Male Comparison	91.141	10.087	93.243	8.537	2.102	0.065	0.225
Female *QuickSmart*	84.545	13.553	94.548	8.811	10.003	<0.001*	0.875
Female Comparison	89.151	14.876	93.851	8.041	4.7	0.02	0.393

In summary, the results of *QuickSmart* students show that in response time the males have improved slightly more than the females. In accuracy the females have improved slightly more than the males. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.700$ for response time and 0.292 for accuracy).

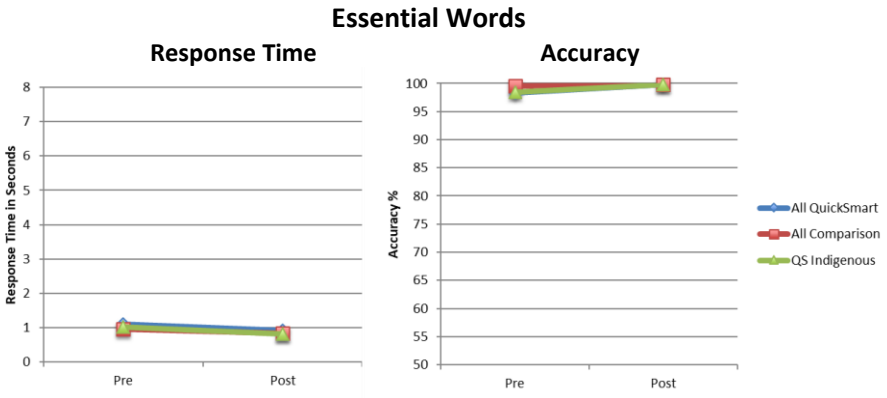
4.3.7 Indigenous Students

Table 13: OZCAAS results – Indigenous *QuickSmart* students 2020

Test	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Essential Words							
Response time (seconds)	1.027	0.362	0.819	0.261	-0.208	<0.001*	0.659
Accuracy (%)	98.405	4.495	99.785	1.052	1.38	0.011	0.423
Level 1 Words							
Response time (seconds)	1.517	0.747	1.054	0.454	-0.463	<0.001*	0.749
Accuracy (%)	93.185	12.578	98.723	3.867	5.538	<0.001*	0.595
Level 2 Words							
Response time (seconds)	1.909	0.934	1.295	0.684	-0.614	<0.001*	0.75
Accuracy (%)	87.418	14.569	95.561	10.05	8.143	<0.001*	0.651
Level 3 Words							
Response time (seconds)	3.917	2.498	2.343	1.743	-1.574	<0.001*	0.731
Accuracy (%)	62.573	22.277	86.793	18.373	24.22	<0.001*	1.186
Sentence Understanding Level 1							
Response time (seconds)	4.326	1.77	3.309	1.143	-1.017	<0.001*	0.683
Accuracy (%)	96.611	7.55	99.164	2.789	2.553	0.005	0.449
Sentence Understanding Level 2							
Response time (seconds)	7.366	2.354	5.53	2.519	-1.836	<0.001*	0.753
Accuracy (%)	87.716	11.465	96.787	7.243	9.071	<0.001*	0.946

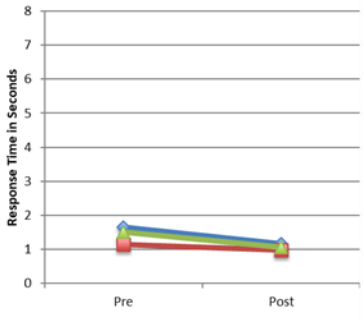
These results indicate that the Indigenous students' gains are comparable to those of the overall *QuickSmart* group. For Essential Words and Level 1 Words, both the response time and accuracy results are impacted by the ceiling effect (the pre-intervention scores were so high that the students did not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

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

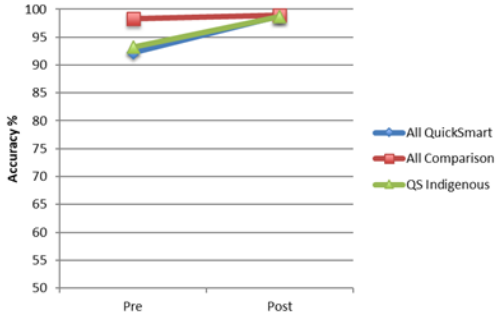


Level 1 Words

Response Time

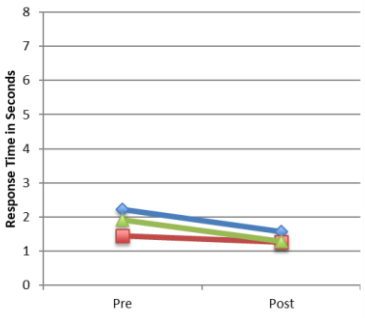


Accuracy

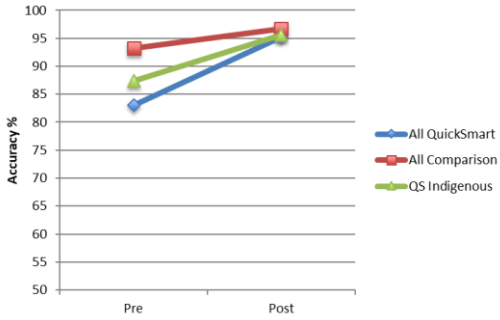


Level 2 Words

Response Time

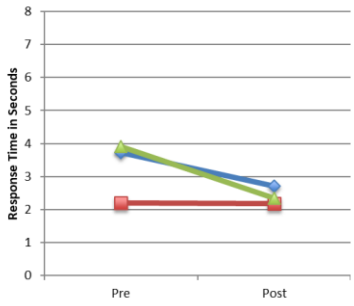


Accuracy

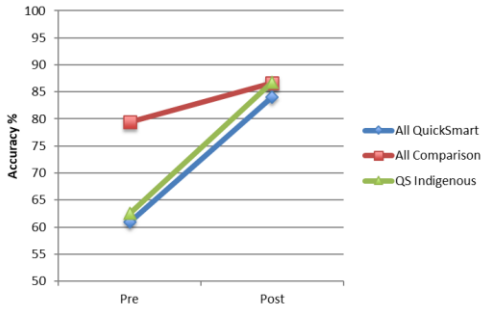


Level 3 Words

Response Time

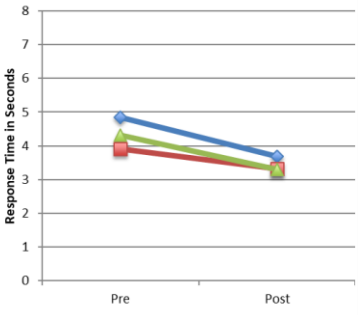


Accuracy

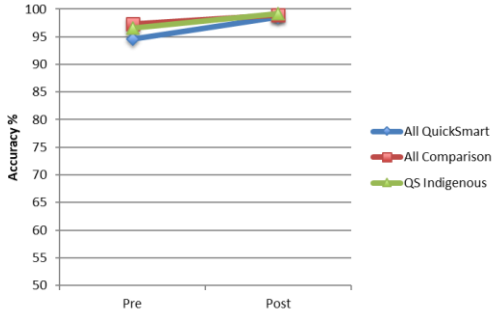


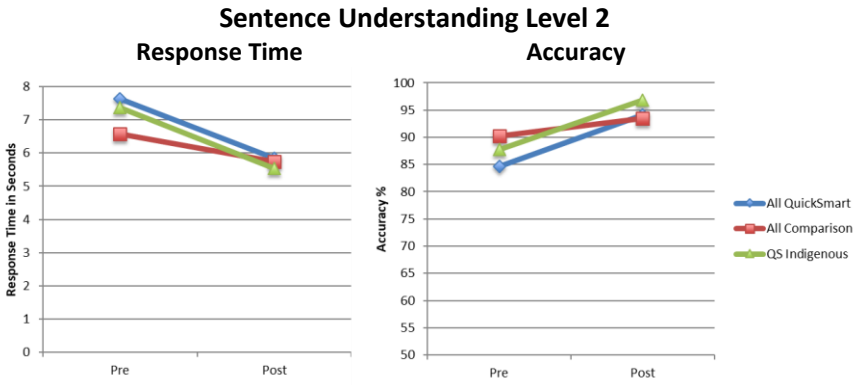
Sentence Understanding Level 1

Response Time



Accuracy





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 – 2020

	Mean	Std. Deviation
Essential Words		
Response time (seconds)	0.6	0.057
Accuracy (%)	100.0	0.0
Level 1 Words		
Response time (seconds)	2.199	0.869
Accuracy (%)	78.817	21.471
Level 2 Words		
Response time (seconds)	3.607	3.008
Accuracy (%)	77.464	16.911
Level 3 Words		
Response time (seconds)	4.564	2.958
Accuracy (%)	57.587	28.588
Sentence Understanding Level 1		
Response time (seconds)	6.058	3.476
Accuracy (%)	94.39	9.315
Sentence Understanding Level 2		
Response time (seconds)	8.739	3.883
Accuracy (%)	81.817	16.493

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 2.2 seconds, with accuracy results of above 78%. In Level 2 Words, the average response rates were below 3.7 seconds, with average accuracy above 77%.

In Sentence Understanding Level 1, the average response rates were below 6.1 seconds, with average accuracy above 94%.

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 times below 4.6

seconds and accuracy over 57% 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 which may have led to a 'have a go attitude' that was not present at the beginning of the *QuickSmart* program.

4.5 Conclusion for 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.

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

5 Independent Assessments

5.1 Why They are Used

The *QuickSmart* pre- and post-intervention 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 Norm Tables were used to convert raw scores from various levels of the PAT test to consistent scaled 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) 2020

Group	Average Gain score	Significance	Effect size
Vocabulary			
All *QuickSmart*	6.11	<0.001*	0.646
All Comparison	3.518	0.004	0.515
Comprehension			
All *QuickSmart*	5.89	<0.001*	0.661
All Comparison	3.322	<0.001*	0.411

The results indicate a very strong improvement for *QuickSmart* students in both the Vocabulary and Comprehension tests. 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) 2020

Gender	Average Gain score	Significance	Effect size
Vocabulary			
QuickSmart Male	5.552	<0.001*	0.556
Comparison Male	2.293	0.12	0.389
QuickSmart Female	6.883	<0.001*	0.792
Comparison Female	5.663	0.011	0.79
Comprehension			
QuickSmart Male	6.2	<0.001*	0.657
Comparison Male	3.516	0.001	0.484
QuickSmart Female	5.559	<0.001*	0.668
Comparison Female	3.108	0.006	0.348

In terms of scaled scores, the results indicate that female *QuickSmart* students improved more than male *QuickSmart* students in vocabulary and male *QuickSmart* students improved more in comprehension. The ndependent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level (p = 0.174 for vocabulary and 0.398 for comprehension).

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

Table 17: PAT-V and PAT-C results – Indigenous (Scale scores) 2020

Group	Average Gain score	Significance	Effect size
Vocabulary			
Indigenous *QuickSmart*	4.234	<0.001*	0.5
All Comparison	3.518	0.004	0.515
Comprehension			
Indigenous *QuickSmart*	6.383	<0.001*	0.826
All Comparison	3.322	<0.001*	0.411

These results show strong Vocabulary improvement for the Indigenous students who participated in *QuickSmart*. These students were able to report a rate of growth in excess of that achieved by the comparison students. The Indigenous students' Comprehension results show a substantial improvement, with the Indigenous students reporting a growth rate in excess of that achieved by both the comparison group and the overall *QuickSmart* group.

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

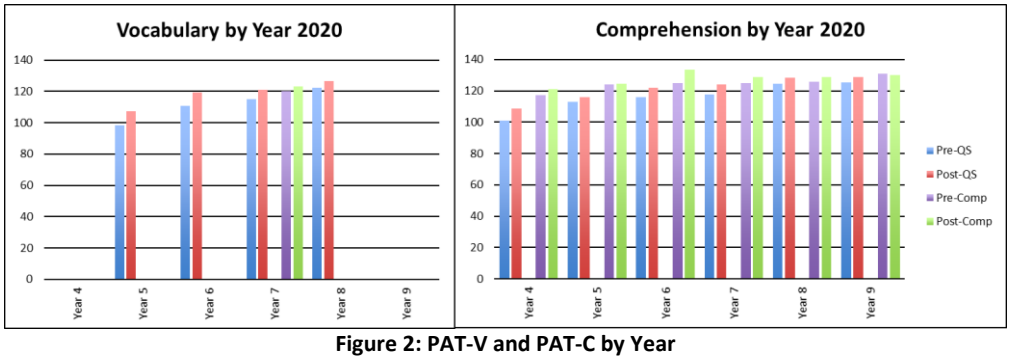


Figure 2: PAT-V and PAT-C by Year

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

Table 18: Percentage students with PAT Gain

Student Type	No. of students with gain	No. of students with PAT	Percentage with Gain
Vocabulary			
QuickSmart	171	217	78.8
Comparison	14	22	63.6
Comprehension			
QuickSmart	353	461	76.6
Comparison	77	107	72.0

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. Despite the disruptions due to the COVID-19 pandemic, 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) 6773 5065.

Professor John Pegg

7 APPENDIX A: Independent Assessment Results

7.1 PAT Results by Region – (Scale Scores) 2020

Cluster of Schools	Pre-Intervention		Post-Intervention				
***QuickSmart* group**	**Mean**	**SD**	**Mean**	**SD**	**Gain**	**p**	**Effect size**
Gippsland Vocabulary	112.593	7.335	117.93	6.617	5.337	<0.001*	0.764
Gippsland Comprehension	119.269	4.757	122.697	5.302	3.428	0.006*	0.681
Horsham Vocabulary							
Horsham Comprehension	127.457	2.007	128.943	6.509	1.486	0.606	0.309
Melbourne Vocabulary	113.932	6.801	118.694	6.274	4.762	<0.001*	0.728
Melbourne Comprehension	118.159	5.705	123.463	7.165	5.304	<0.001*	0.819
Mornington Vocabulary	108.16	13.845	114.645	8.561	6.485	0.03	0.563
Mornington Comprehension	102.77	15.793	112.46	6.703	9.69	0.007*	0.799
North Coast Vocabulary	108.362	10.743	117.459	11.595	9.097	<0.001*	0.814
North Coast Comprehension	115.715	6.01	122.46	7.469	6.745	<0.001*	0.995
North West Vocabulary	123.363	7.749	128.063	8.153	4.7	0.004*	0.591
North West Comprehension	126.716	7.215	131.289	5.962	4.573	0.016	0.691
Perth Vocabulary							
Perth Comprehension	115.867	3.48	128.333	4.737	12.466	0.001*	2.999
Port Augusta Vocabulary							
Port Augusta Comprehension	107.262	15.129	124.7	9.342	17.438	0.023	1.387
Queensland Vocabulary	116.068	5.507	125.455	7.523	9.387	<0.001*	1.424
Queensland Comprehension	119.774	7.426	125.122	6.099	5.348	<0.001*	0.787
Riverina Vocabulary	108.143	13.739	116.829	9.035	8.686	0.014	0.747
Riverina Comprehension	118.747	6.15	123.809	9.013	5.062	0.001*	0.656
Southern Sydney Vocabulary	118.4	7.547	124.08	5.102	5.68	0.003*	0.882
Southern Sydney Comprehension	121.333	5.635	125.307	6.298	3.974	0.054	0.665
Sydney Vocabulary	120.394	8.506	123.209	7.95	2.815	<0.001*	0.342
Sydney Comprehension	114.397	11.334	120.681	12.686	6.284	<0.001*	0.522

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

7.2 PAT Results – by Demographic (Scale Scores) 2020

Demographic	Pre-Intervention		Post-Intervention				
	Mean	SD	Mean	SD	Gain	p	Effect size
All Schools Vocabulary – *QuickSmart* Group	**114.766**	**9.976**	**120.876**	**8.903**	**6.11**	**<0.001***	**0.646**
All Schools Vocabulary – Comparison Group	**119.914**	**7.55**	**123.432**	**6.038**	**3.518**	**0.004***	**0.515**
All Schools Comprehension – *QuickSmart* Group	**117.321**	**9.117**	**123.211**	**8.702**	**5.89**	**<0.001***	**0.661**
All Schools Comprehension – Comparison Group	**124.538**	**8.013**	**127.86**	**8.162**	**3.322**	**<0.001***	**0.411**
Vocabulary – *QuickSmart* Indigenous	120.708	8.564	124.942	8.361	4.234	<0.001*	0.5
Comprehension – *QuickSmart* Indigenous	121.236	8.156	127.619	7.281	6.383	<0.001*	0.826
Vocabulary – *QuickSmart* Male	115.231	10.365	120.783	9.6	5.552	<0.001*	0.556
Vocabulary – Comparison Male	122.536	6.6	124.829	5.093	2.293	0.12	0.389
Vocabulary – *QuickSmart* Female	114.122	9.431	121.005	7.885	6.883	<0.001*	0.792
Vocabulary – Comparison Female	115.325	7.232	120.988	7.104	5.663	0.011	0.79
Comprehension – *QuickSmart* Male	116.839	9.896	123.039	8.951	6.2	<0.001*	0.657
Comprehension – Comparison Male	123.936	7.518	127.452	7.006	3.516	0.001*	0.484
Comprehension – *QuickSmart* Female	117.836	8.195	123.395	8.445	5.559	<0.001*	0.668
Comprehension – Comparison Female	125.2	8.549	128.308	9.32	3.108	0.006*	0.348

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

7.3 PAT Results – by State (Scale Scores) 2020

Demographic	Pre-Intervention		Post-Intervention				
	Mean	SD	Mean	SD	Gain	p	Effect size
NSW Vocabulary - *QuickSmart* Group	116.507	11.003	122.198	9.588	5.691	<0.001*	0.551
NSW Comprehension - *QuickSmart* Group	117.164	9.171	123.064	10.145	5.9	<0.001*	0.61
NSW Comprehension - Comparison Group	119.674	9.695	123.665	10.981	3.991	0.029	0.385
Qld Vocabulary - *QuickSmart* Group	116.068	5.507	125.455	7.523	9.387	<0.001*	1.424
Qld Vocabulary - Comparison Group	125.0	3.087	124.325	3.237	-0.675		no improvement
Qld Comprehension - *QuickSmart* Group	119.774	7.426	125.122	6.099	5.348	<0.001*	0.787
Qld Comprehension - Comparison Group	127.871	7.119	129.038	7.072	1.167	0.695	0.164
SA Comprehension - *QuickSmart* Group	107.262	15.129	124.7	9.342	17.438	0.023	1.387
Vic Vocabulary - *QuickSmart* Group	112.011	9.361	117.411	7.12	5.4	<0.001*	0.649
Vic Vocabulary - Comparison Group	116.946	8.187	122.477	7.339	5.531	<0.001*	0.711
Vic Comprehension - *QuickSmart* Group	116.899	9.213	122.242	7.739	5.343	<0.001*	0.628
Vic Comprehension - Comparison Group	124.377	5.084	129.516	6.608	5.139	<0.001*	0.872
WA Comprehension - *QuickSmart* Group	115.867	3.48	128.333	4.737	12.466	0.001*	2.999
WA Comprehension - Comparison Group	115.92	5.728	125.58	6.457	9.66	0.124	1.583

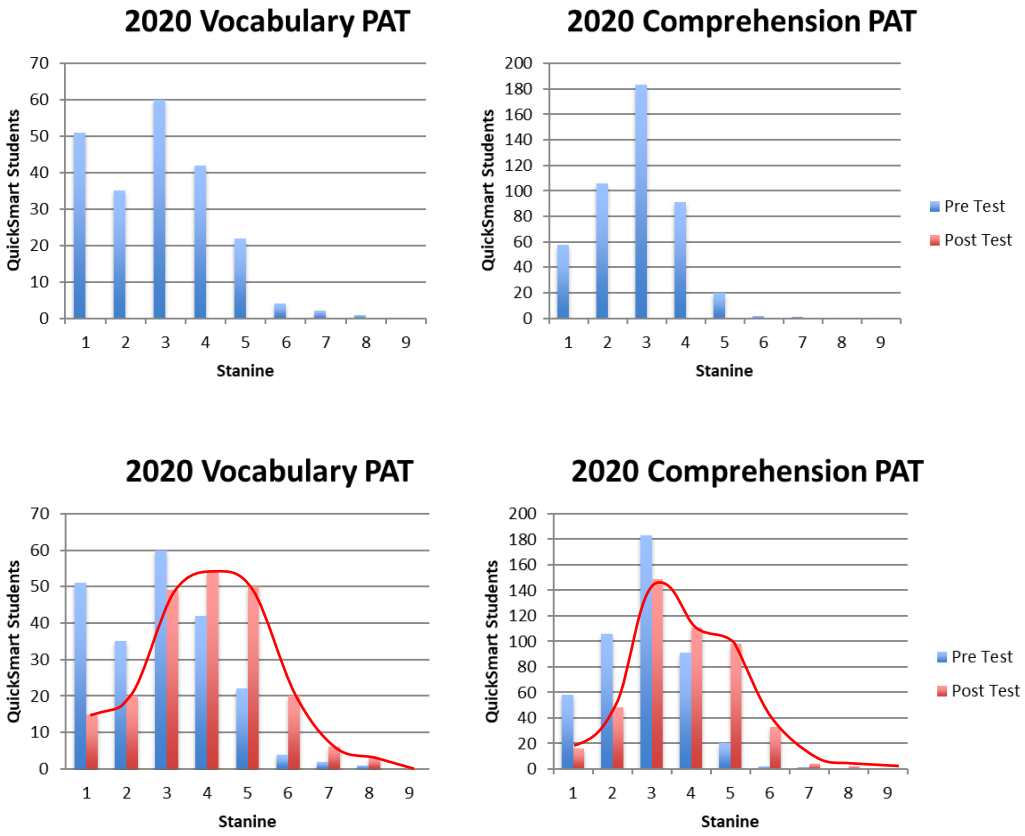
Note: only students who did both 'pre' and 'post' test are included in the table. Groups with less than 5 students are excluded.

7.4 PAT Results – by Year (Scale Scores) 2020

Year	Pre-Intervention		Post-Intervention				
	Mean	SD	Mean	SD	Gain	p	Effect size
Year 4 Vocabulary – *QuickSmart* Group							
Year 4 Vocabulary – Comparison Group							
Year 4 Comprehension – *QuickSmart* Group	101.156	7.378	108.581	9.035	7.425	0.001	0.9
Year 4 Comprehension – Comparison Group	117.283	12.434	120.983	16.088	3.7	0.466	0.257
Year 5 Vocabulary – *QuickSmart* Group	98.417	7.126	107.142	9.0	8.725	<0.001*	1.075
Year 5 Vocabulary – Comparison Group							
Year 5 Comprehension – *QuickSmart* Group	112.878	8.236	116.041	7.929	3.163	0.018	0.391
Year 5 Comprehension – Comparison Group	124.312	3.572	124.45	4.368	0.138	0.938	0.035
Year 6 Vocabulary – *QuickSmart* Group	110.917	12.724	119.4	6.512	8.483	0.036	0.839
Year 6 Vocabulary – Comparison Group	117.8		128.7		10.9		
Year 6 Comprehension – *QuickSmart* Group	116.061	7.399	121.804	9.717	5.743	0.002	0.665
Year 6 Comprehension – Comparison Group	124.76	5.903	133.32	6.421	8.56	0.004	1.388
Year 7 Vocabulary – *QuickSmart* Group	114.824	9.011	121.01	8.169	6.186	<0.001*	0.719
Year 7 Vocabulary – Comparison Group	120.014	7.721	123.181	6.069	3.167	0.009	0.456
Year 7 Comprehension – *QuickSmart* Group	117.583	8.307	124.0	7.663	6.417	<0.001*	0.803
Year 7 Comprehension – Comparison Group	125.095	6.936	128.881	6.775	3.786	<0.001*	0.552
Year 8 Vocabulary – *QuickSmart* Group	122.519	7.142	126.459	7.554	3.94	0.001	0.536
Year 8 Vocabulary – Comparison Group							
Year 8 Comprehension – *QuickSmart* Group	124.41	6.104	128.231	6.756	3.821	<0.001*	0.593
Year 8 Comprehension – Comparison Group	125.906	6.853	128.825	5.867	2.919	0.075	0.458
Year 9 Vocabulary – *QuickSmart* Group							
Year 9 Vocabulary – Comparison Group							
Year 9 Comprehension – *QuickSmart* Group	125.322	4.274	128.644	4.907	3.322	0.224	0.722
Year 9 Comprehension – Comparison Group	130.889	5.993	130.167	9.364	-0.722		no improvement

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

7.5 National Literacy PAT Improvement of QuickSmart Students



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

A stanine score of:

- 1 represents performance below the bottom 4% of the population,
- 2 represents performance in the lower 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 higher77-88% of the population
- 8 represents performance in the higher 89-96% of the population
- 9 represents performance above the top 4% of the population.

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

7.6 PAT Vocabulary Results by Percentile

Demographic	Mean Percentile		
	Pre	**Post**	**Gain**
All *QuickSmart*	19.032	33.373	14.341
All Comparison	31.136	40.364	9.228
Indigenous *QuickSmart*	28.423	40.962	12.539
QuickSmart Female	17.648	33.077	15.429
Comparison Female	19.25	33.625	14.375
QuickSmart Male	20.032	33.587	13.555
Comparison Male	37.929	44.214	6.285
Year			
QuickSmart Year 5	6.833	22.083	15.25
QuickSmart Year 6	18.833	34.167	15.334
QuickSmart Year 7	18.948	33.762	14.814
Comparison Year 7	31.333	39.238	7.905
QuickSmart Year 8	25.037	35.741	10.704
Lessons attended			
<=20	15.786	21.107	5.321
21-40	16.473	26.764	10.291
41-60	22.6	37.488	14.888
61-80	18.037	40.37	22.333

7.7 PAT Comprehension Results by Percentile

Demographic	Mean Percentile		
	Pre	Post	Gain
All *QuickSmart*	17.056	29.649	12.593
All Comparison	32.991	41.879	8.888
Indigenous *QuickSmart*	19.738	34.762	15.024
QuickSmart Female	17.839	30.031	12.192
Comparison Female	34.902	43.902	9
QuickSmart Male	16.324	29.29	12.966
Comparison Male	31.25	40.036	8.786
Year			
QuickSmart Year 4	14.125	26.75	12.625
Comparison Year 4	45.667	54.833	9.166
QuickSmart Year 5	21.344	28.031	6.687
Comparison Year 5	49	49.5	0.5
QuickSmart Year 6	17.478	32.174	14.696
Comparison Year 6	37.6	62.6	25
QuickSmart Year 7	16.255	29.453	13.198
Comparison Year 7	31.644	41.356	9.712
QuickSmart Year 8	19.038	29.981	10.943
Comparison Year 8	23.125	30.938	7.813
QuickSmart Year 9	15.333	23.222	7.889
Comparison Year 9	30.444	31.111	0.667
Lessons attended			
<=20	12.714	23.452	10.738
21-40	17.564	30.055	12.491
41-60	19.08	32.239	13.159
61-80	17.813	28.533	10.72
80+	13.5	24.556	11.056