quicksmart

Annual Literacy Program Report

2021

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

SiMERR

une University of New England

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Table Of Contents

List of Figures

List of Tables

1 *QuickSmart* Executive Summary in 2021

1.1 Introduction

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

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

1. Too many Australian Indigenous and non-Indigenous students have shown to be resistant to improvements in learning despite large investments of funds to overcome problems they face. Longitudinal national data indicate that low-achieving students have not drawn lasting benefits from most current in-class and withdrawal instructional activities.
2. Teaching assistants are
   (i) an underutilised,
   (ii) poorly supported, and
   (iii) a seldom recognised resource in school education.

   Based on *QuickSmart* experience of over 20 years, these adults, with appropriate training, are highly motivated, and offer cost-effective, long-term sustainable ways to close the achievement gap for low-achieving students.
3. In remote and rural areas, Indigenous teaching assistants (trained as *QuickSmart* Instructors) are a resource able to enrich their whole community.
4. Educational support programs need to be sustainable in the short- and long-term without large drains on the public purse. Sustainability means
   (i) cost-efficiency,
   (ii) clear exit criteria,
   (iii) proven longitudinal results,
   (iv) documented ongoing benefits for students and instructors, and
   (v) replicability (including quality assurance) across all regions of Australia.

1.2 Overview of *QuickSmart* Data

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

Most data are obtained through the assessment files in the OZCAAS assessment program developed by academic staff at the Massachusetts Institute of Technology. The program offers 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 comprehension indicate a strong to substantial improvement for the *QuickSmart* students in terms of accuracy and response time. The evidence provided illustrates that *QuickSmart* students narrowed the achievement gap by

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

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

1.3 Findings – Response time and Accuracy

In 2021, the *QuickSmart* team at the University of New England received matched data from 1026 students who participated in *QuickSmart* Literacy lessons and 180 average-achieving comparison peers. These students were drawn from schools around Australia.

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 Sentence Understanding Level 2 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 times at the end of the program were below 5.2 seconds, with accuracy results of above 63%. In Level 2 Words, the average response times were below 3.4 seconds, with average accuracy above 79%.

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 in Sentence Understanding Level 2 are encouraging with response times below 8.5 seconds and accuracy over 85% at post-test. It is likely that part of this improvement may be due to the fact that:

(i) 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
(ii) students have increased their ability to benefit from classroom instruction.

1.4 Findings – ACER tests

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

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

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

In terms of Scale scores, the results indicate that female *QuickSmart* students improved more than male *QuickSmart* students in both Vocabulary and Comprehension. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level (p = 0.253 for Vocabulary and 0.242 for Comprehension).

For Indigenous students, the results also show substantial improvements from those who participated in *QuickSmart*. In the data presented this improvement is slightly smaller than that of the overall *QuickSmart* group for Vocabulary. However, the Indigenous students' Comprehension results show an improvement in excess of that achieved by the comparison group.

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

1.5 Findings – Qualitative Data

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

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

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

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

1.6 Conclusion

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

2 Background

2.1 Purpose of *QuickSmart*

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

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

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

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

2.2 *QuickSmart* Program Description

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

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

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

The aims of *QuickSmart*, are to:

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

(ii) free working-memory capacity from an excessive focus on mundane or routine tasks, and, as a result

(iii) engage in more meaningful tasks associated with more demanding cognitive activities.

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

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

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

(i) students' ability to remain on-task is enhanced, resulting in improved efforts to persist and maintain concentration on the material provided,

(ii) students become more knowledgeable about how the brain learns, in relation to
   - the value of deliberate practice,
   - the positive importance of mistakes and learning from them,
   - the benefits of persevering and how crucial it is to exert effort.

(iii) students practice the skill of setting realistic goals for themselves and using this idea to help them monitor their own academic learning and progress.

(iv) all the above skills can be developed, and with consistent practice these skills that can be transferred to classroom use.

2.3 The role of the Literacy lesson structure in fostering understanding

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

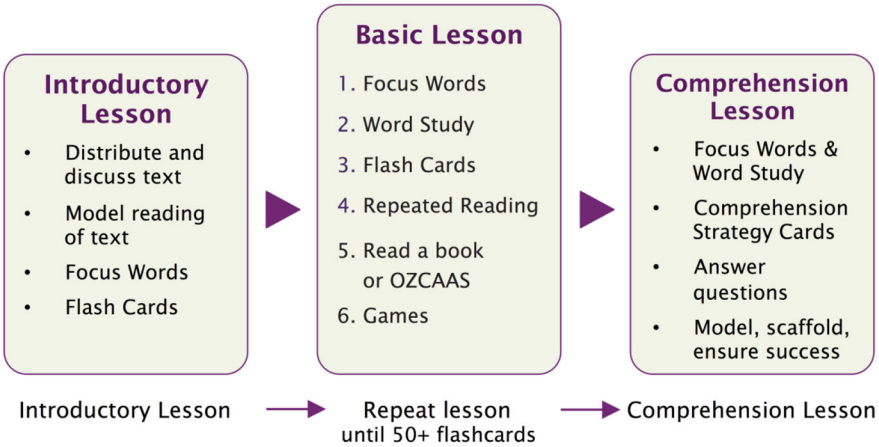


Figure 1: *QuickSmart* Literacy lesson structures

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

3 *QuickSmart* Tests – 2021

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 student gender and participating Indigenous students.

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

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

The vocabulary tests available are:

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

The comprehension tests available are:

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

The second set of analyses concern the results of independent tests. Most schools have utilised the Progressive Achievement Test (PAT) assessments in Vocabulary (V) and Reading Comprehension (C) for this purpose. These are standardised tests developed by the Australian Council for Education Research (ACER). PAT-V and PAT-C tests are independent tests taken prior to commencement of *QuickSmart* and at the completion of the program. Students' PAT results provide information about how the knowledge, skills and attitudes developed in *QuickSmart* are used and how they transfer to other broad areas of reading skill, which **are not** the specific target of *QuickSmart* instruction.

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

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

3.2 Background to Test Interpretation

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

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

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

Additionally, as *QuickSmart* programs become established in schools, sometimes even within the first year of operation, it becomes increasingly difficult to establish even a true 'comparison' group. This occurs as more and more *QuickSmart* practitioners share *QuickSmart* teaching practices, resources and activities throughout their schools. Our

information from school reports is that a majority of Principals begin this school-wide implementation of *QuickSmart* in their schools within the first two-three years.

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

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

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

4 Results on the OZCAAS Assessments

4.1 Introduction

In 2021, the *QuickSmart* team at the University of New England received data from 1026 students who participated in *QuickSmart* Literacy lessons and 180 'average-achieving' comparison peers. These students were drawn from schools across 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 in the 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 may have been 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.

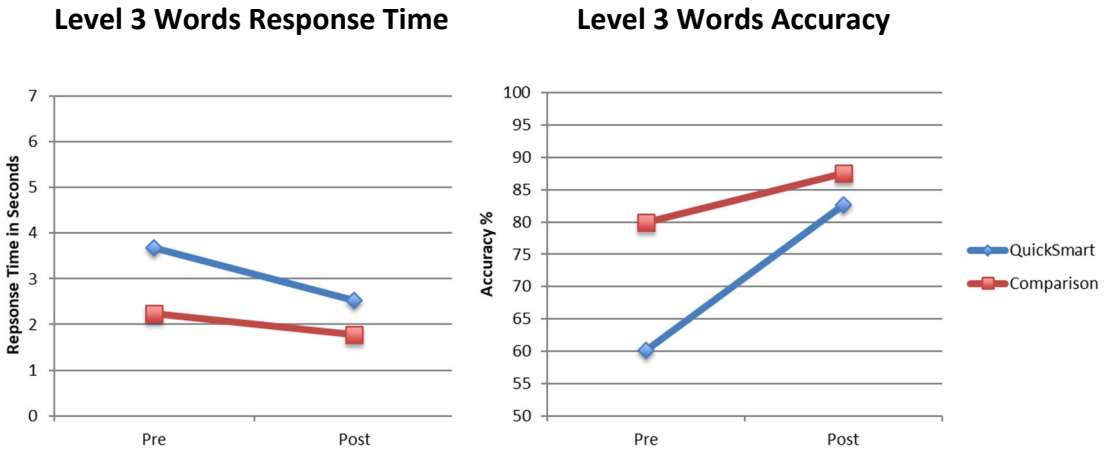
4.2 Combined OZCAAS Analysis

4.2.1 Level 3 Words

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

Table 1: OZCAAS Level 3 Words results – all students 2021

Level 3 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	3.681	2.379	2.527	1.802	-1.154	<0.001*	0.547
Res Time (secs) Comp	2.244	1.428	1.78	1.043	-0.464	<0.001*	0.371
Accuracy (%) QS	60.161	24.790	82.711	21.222	22.550	<0.001*	0.977
Accuracy (%) Comp	79.912	21.799	87.527	17.188	7.615	<0.001*	0.388



On the Level 3 Words test, there were paired data for 890 *QuickSmart* students and 163 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 1.154 seconds. (Note: The negative number in the table means that the post-test time is lower than the pre-test time. This result is the desired pattern of improvement). The effect size for this result is 0.547, which indicates strong improvement.

Effect size statistics can be understood based on the work of John Hattie (2009, *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement.* 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 22 percentage points, which is a very strong result. The effect size of 0.977, indicates a substantial improvement for the *QuickSmart* group.

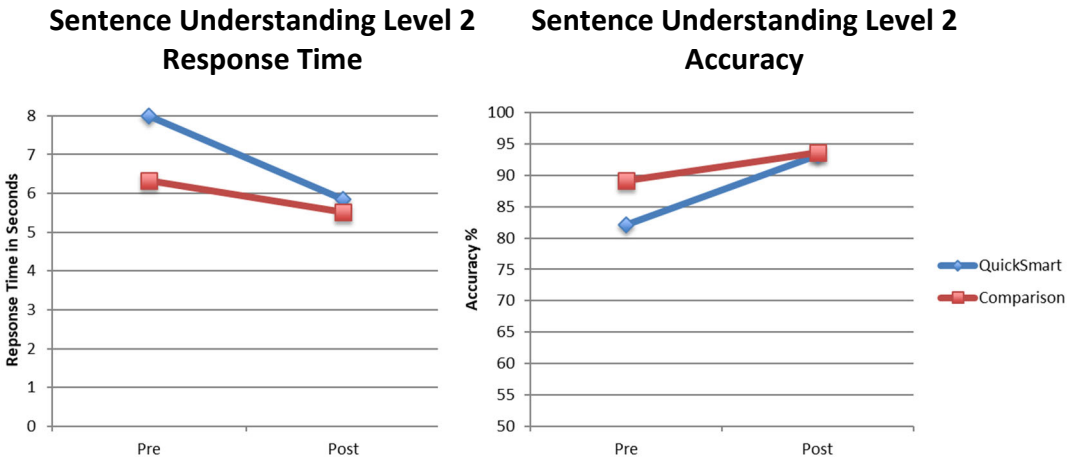
In summary, Table 1 shows that when compared to the scores of the comparison students, *QuickSmart* students' scores indicate greater improvement in terms of response time and accuracy with Level 3 Words. The graphs illustrate the narrowing of the gap between the *QuickSmart* students and comparison 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 2021

Sentence Understanding Level 2	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	7.992	3.213	5.853	2.492	-2.139	<0.001*	0.744
Res Time (secs) Comp	6.339	2.271	5.519	2.205	-0.820	<0.001*	0.367
Accuracy (%) QS	82.157	15.974	93.267	10.239	11.110	<0.001*	0.828
Accuracy (%) Comp	89.186	16.003	93.700	7.985	4.514	<0.001*	0.357



On the Sentence Understanding Level 2 test, there were paired data for 878 *QuickSmart* students and 162 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 2.139 seconds, which is a strong result. The effect size for this result is 0.744, which indicates very strong improvement.

In terms of accuracy, the *QuickSmart* students' average scores have improved by more than 11 percentage points, which is a strong result. The effect size is 0.828, which indicates substantial improvement for the *QuickSmart* group.

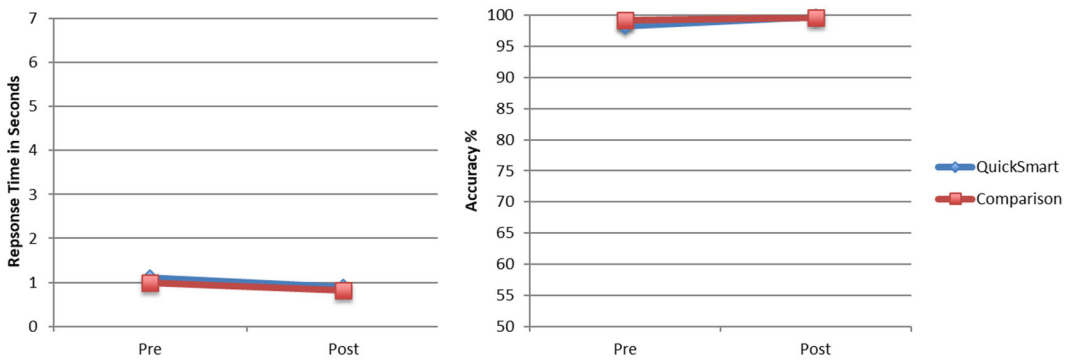
In summary, Table 2 shows that when compared to the scores of the comparison students, *QuickSmart* students' scores indicate greater improvement in terms of response time and accuracy in Sentence Understanding Level 2. The diagrams illustrate that as a result of the *QuickSmart* intervention, the *QuickSmart*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

4.2.3 Essential Words

Table 3: OZCAAS Essential Words – all students 2021

Essential Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Res Time (secs) QS	1.105	0.463	0.901	0.401	-0.204	<0.001*	0.471
Res Time (secs) Comp	0.990	0.521	0.825	0.27	-0.166	<0.001*	0.399
Accuracy (%) QS	98.259	5.237	99.753	2.617	1.494	<0.001*	0.361
Accuracy (%) Comp	99.189	4.962	99.663	2.514	0.474	0.027	0.121

Essential Words Response Time **Essential Words Accuracy**



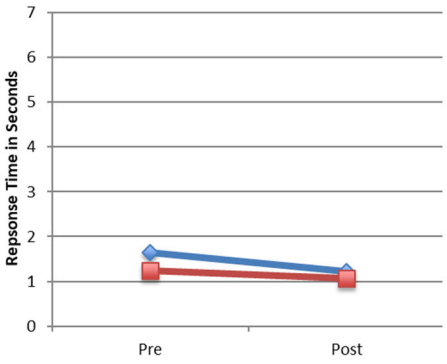
In summary, the results for Essential Words, the most commonly used words that should be known by middle school students, indicate a stronger improvement for the *QuickSmart* students than for the comparison students. However, both the response time and accuracy results show a strong ceiling effect as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

4.2.4 Level 1 Words

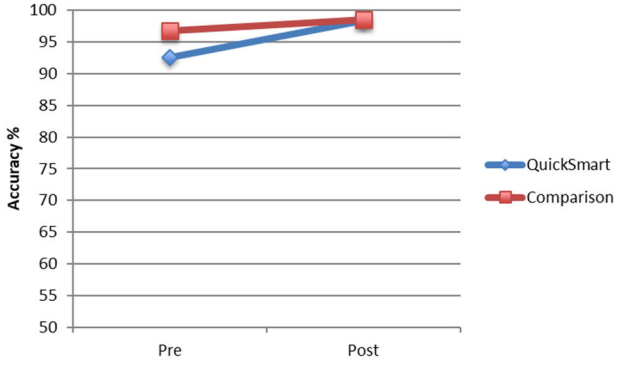
Table 4: OZCAAS Level 1 Words – all students 2021

Level 1 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	1.646	1.067	1.214	0.840	-0.432	<0.001*	0.450
Res Time (secs) Comp	1.248	0.935	1.076	0.973	-0.171	0.037	0.180
Accuracy (%) QS	92.612	12.443	98.424	5.989	5.812	<0.001*	0.595
Accuracy (%) Comp	96.801	11.211	98.556	8.307	1.755	<0.001*	0.178

Level 1 Words Response Time



Level 1 Words Accuracy



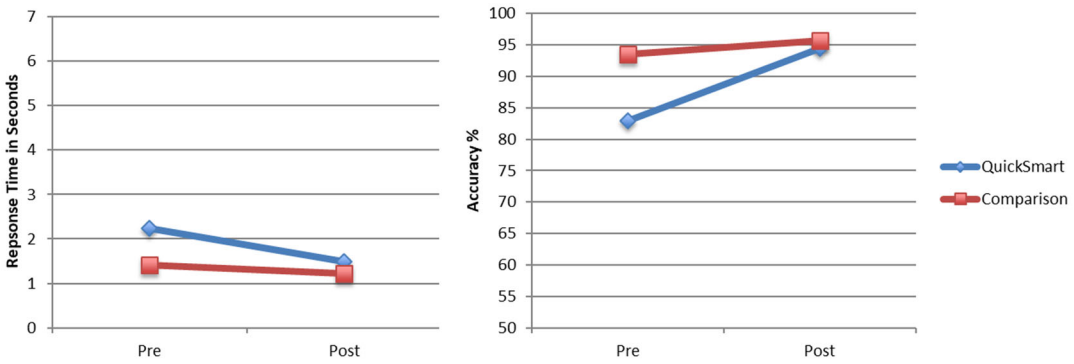
In summary, the results for Level 1 Words indicate a strong improvement for the *QuickSmart* students in both response time and accuracy. The diagrams illustrate that as a result of the *QuickSmart* intervention, the *QuickSmart* students narrowed the gap to the comparison students in response time. 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 2021

Level 2 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	2.248	1.481	1.493	0.926	-0.756	<0.001*	0.612
Res Time (secs) Comp	1.419	0.801	1.214	0.778	-0.205	<0.001*	0.260
Accuracy (%) QS	82.942	17.750	94.519	11.584	11.577	<0.001*	0.772
Accuracy (%) Comp	93.462	14.005	95.725	11.787	2.263	<0.001*	0.175

Level 2 Words Response Time **Level 2 Words Accuracy**



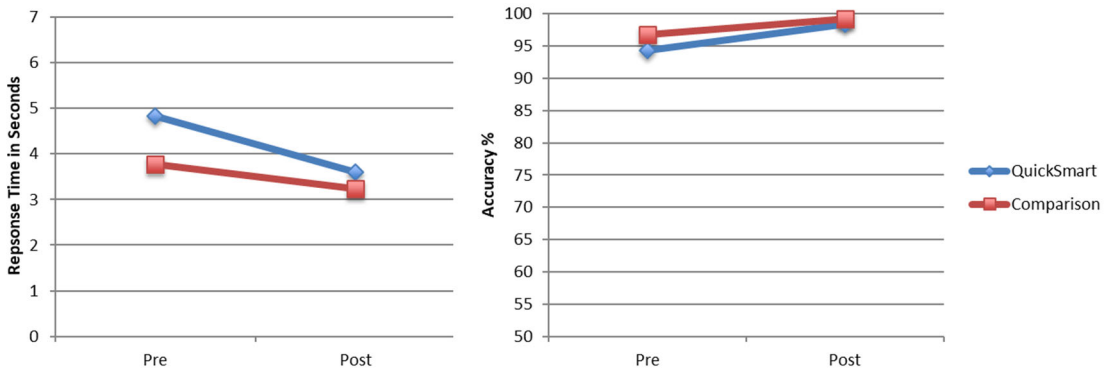
The results for Level 2 Words indicate a very strong improvement for the *QuickSmart* students in both response time and accuracy. The diagrams illustrate that the *QuickSmart* students narrowed the gap to the comparison students in both response time and accuracy.

4.2.6 Sentence Understanding Level 1

Table 6: OZCAAS Sentence Understanding Level 1 – all students 2021

Sentence Understanding Level 1	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	4.835	2.076	3.597	1.541	-1.239	<0.001*	0.678
Res Time (secs) Comp	3.781	1.402	3.229	1.254	-0.552	<0.001*	0.415
Accuracy (%) QS	94.353	9.965	98.351	5.072	3.998	<0.001*	0.506
Accuracy (%) Comp	96.796	9.902	99.219	2.493	2.423	0.002	0.336

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 2021

Essential Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	1.089	0.431	0.881	0.333	-0.208	<0.001*	0.540
Male Comparison	0.971	0.320	0.830	0.234	-0.141	<0.001*	0.503
Female *QuickSmart*	1.126	0.500	0.927	0.471	-0.199	<0.001*	0.409
Female Comparison	1.016	0.709	0.818	0.313	-0.198	0.005	0.362
Accuracy (%)							
Male *QuickSmart*	98.038	5.335	99.709	3.288	1.671	<0.001*	0.377
Male Comparison	99.701	1.489	99.941	0.559	0.240	0.105	0.213
Female *QuickSmart*	98.536	5.104	99.808	1.378	1.272	<0.001*	0.340
Female Comparison	98.501	7.374	99.290	3.778	0.789	0.088	0.135

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 2021

Level 1 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	1.663	1.026	1.192	0.682	-0.471	<0.001*	0.541
Male Comparison	1.179	0.476	1.001	0.327	-0.178	<0.001*	0.436
Female *QuickSmart*	1.626	1.117	1.240	0.998	-0.386	<0.001*	0.364
Female Comparison	1.342	1.325	1.178	1.446	-0.164	0.374	0.118
Accuracy (%)							
Male *QuickSmart*	92.021	12.409	98.429	5.912	6.408	<0.001*	0.659
Male Comparison	97.873	4.573	99.539	2.429	1.666	<0.001*	0.455
Female *QuickSmart*	93.324	12.461	98.418	6.088	5.094	<0.001*	0.519
Female Comparison	95.341	16.342	97.217	12.376	1.876	0.032	0.129

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 strong ceiling effect.

4.3.3 Level 2 Words by Gender

Table 9: OZCAAS Level 2 Words results – all students by gender 2021

Level 2 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	2.237	1.477	1.452	0.851	-0.785	<0.001*	0.651
Male Comparison	1.428	0.703	1.212	0.711	-0.216	<0.001*	0.305
Female *QuickSmart*	2.262	1.488	1.542	1.007	-0.720	<0.001*	0.567
Female Comparison	1.406	0.922	1.215	0.866	-0.191	0.002	0.214
Accuracy (%)							
Male *QuickSmart*	82.298	17.689	94.400	12.002	12.102	<0.001*	0.801
Male Comparison	94.061	9.875	96.865	6.383	2.804	<0.001*	0.337
Female *QuickSmart*	83.714	17.812	94.662	11.074	10.948	<0.001*	0.738
Female Comparison	92.655	18.202	94.188	16.421	1.533	0.059	0.088

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 = 0.417 for response time and 0.227 for accuracy).

4.3.4 Level 3 Words by Gender

Table 10: OZCAAS Level 3 Words results – all students by gender 2021

Level 3 Words	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	3.629	2.297	2.486	1.803	-1.143	<0.001*	0.554
Male Comparison	2.218	1.328	1.808	1.059	-0.410	<0.001*	0.341
Female *QuickSmart*	3.745	2.477	2.577	1.802	-1.168	<0.001*	0.539
Female Comparison	2.28	1.563	1.741	1.027	-0.539	<0.001*	0.408
Accuracy (%)							
Male *QuickSmart*	59.181	24.263	82.5800	21.162	23.399	<0.001*	1.028
Male Comparison	79.917	21.552	88.221	14.636	8.304	<0.001*	0.451
Female *QuickSmart*	61.356	25.398	82.872	21.320	21.516	<0.001*	0.918
Female Comparison	79.906	22.291	86.581	20.230	6.675	<0.001*	0.314

In summary, the results of *QuickSmart* students show that in the response time the females have improved slightly more than the males and in accuracy the males have improved more than the females. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level (p = 0.845 for response time and 0.175 for accuracy).

4.3.5 Sentence Understanding Level 1 by Gender

Table 11: OZCAAS Sentence Understanding Level 1 results – all students by gender 2021

Sentence Understanding Level 1	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	4.922	2.069	3.687	1.613	-1.235	<0.001*	0.666
Male Comparison	3.754	1.126	3.313	0.988	-0.441	<0.001*	0.416
Female *QuickSmart*	4.730	2.081	3.487	1.444	-1.243	<0.001*	0.694
Female Comparison	3.818	1.716	3.115	1.546	-0.703	<0.001*	0.431
Accuracy (%)							
Male *QuickSmart*	94.178	10.291	98.339	4.662	4.161	<0.001*	0.521
Male Comparison	98.149	4.509	99.166	2.742	1.017	0.045	0.273
Female *QuickSmart*	94.566	9.563	98.365	5.534	3.799	<0.001*	0.486
Female Comparison	94.952	14.136	99.291	2.125	4.339	0.010	0.429

In summary, the results of *QuickSmart* students show that in the response time the females have improved slightly more than the males and in accuracy the males have improved more than the females. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level (p = 0.948 for response time and 0.533 for accuracy).

4.3.6 Sentence Understanding Level 2 by Gender

Table 12: OZCAAS Sentence Understanding Level 2 results – all students by gender 2021

Sentence Understanding Level 2	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Response Time (seconds)							
Male *QuickSmart*	8.058	3.348	5.939	2.621	-2.119	<0.001*	0.705
Male Comparison	6.423	2.049	5.619	1.892	-0.804	<0.001*	0.408
Female *QuickSmart*	7.912	3.041	5.748	2.324	-2.164	<0.001*	0.800
Female Comparison	6.223	2.558	5.38	2.585	-0.843	0.003	0.328
Accuracy (%)							
Male *QuickSmart*	81.282	16.85	93.259	10.321	11.977	<0.001*	0.857
Male Comparison	89.644	14.454	94.874	6.849	5.230	0.010	0.462
Female *QuickSmart*	83.227	14.783	93.276	10.151	10.049	<0.001*	0.792
Female Comparison	88.554	18.020	92.076	9.137	3.522	0.098	0.247

In summary, the results of *QuickSmart* students show that in response time the females have improved slightly more than the males. In accuracy the males have improved more than the females. 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 = 0.745) but they are significant in accuracy (p = 0.034). However, the small effect size for accuracy (Cohen's d = 0.134) indicates that this statistical finding is not meaningful for practical purposes.

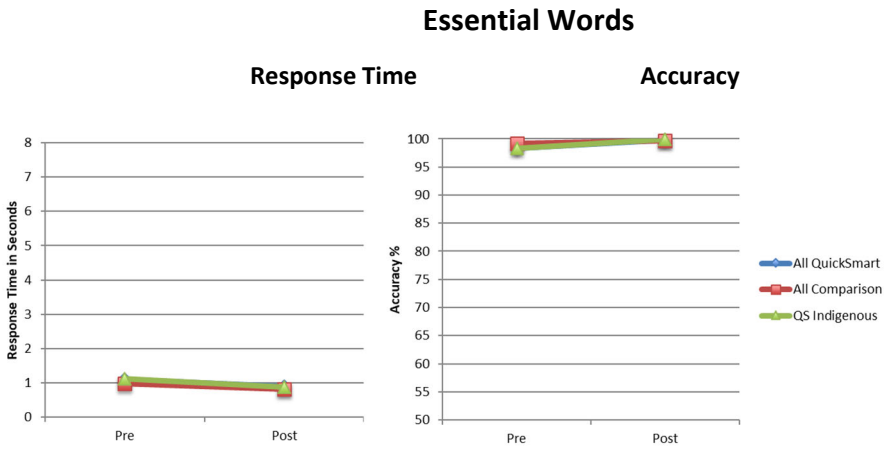
4.3.7 Indigenous Students

Table 13: OZCAAS results – Indigenous *QuickSmart* students 2021

Test	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Essential Words							
Response time (seconds)	1.131	0.507	0.881	0.279	-0.250	<0.001*	0.611
Accuracy (%)	98.261	4.770	99.858	0.860	1.597	<0.001*	0.466
Level 1 Words							
Response time (seconds)	1.708	0.954	1.205	0.611	-0.503	<0.001*	0.628
Accuracy (%)	91.955	11.736	98.261	5.270	6.306	<0.001*	0.693
Level 2 Words							
Response time (seconds)	2.434	1.667	1.483	0.888	-0.951	<0.001*	0.712
Accuracy (%)	81.634	17.987	92.890	13.510	11.256	<0.001*	0.708
Level 3 Words							
Response time (seconds)	3.847	2.545	2.532	1.926	-1.315	<0.001*	0.583
Accuracy (%)	59.315	25.266	79.719	23.796	20.404	<0.001*	0.831
Sentence Understanding Level 1							
Response time (seconds)	4.998	2.276	3.639	1.761	-1.359	<0.001*	0.668
Accuracy (%)	94.494	8.304	98.174	5.728	3.680	<0.001*	0.516
Sentence Understanding Level 2							
Response time (seconds)	7.977	3.087	5.625	2.302	-2.352	<0.001*	0.864
Accuracy (%)	83.196	14.685	94.155	11.101	10.959	<0.001*	0.842

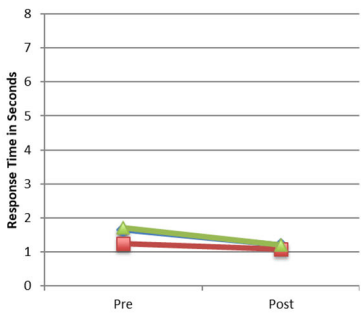
These results indicate that the Indigenous students' gains are comparable to those of the overall *QuickSmart* group. For Essential Words and Level 1 Words, both the response time and accuracy results are impacted by the ceiling effect (the pre-intervention scores were so high that the students did not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

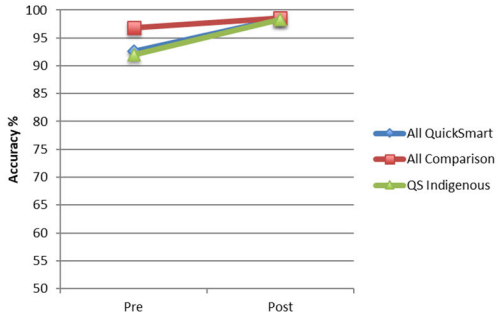


Level 1 Words

Response Time

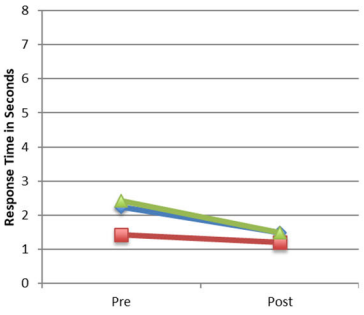


Accuracy

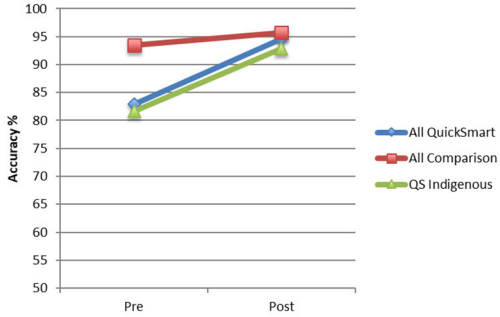


Level 2 Words

Response Time

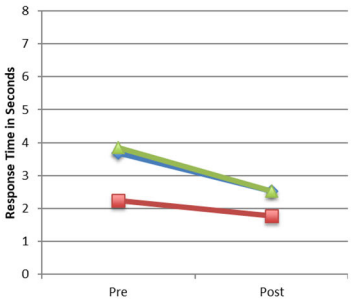


Accuracy

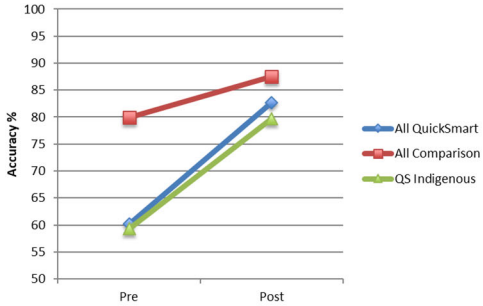


Level 3 Words

Response Time

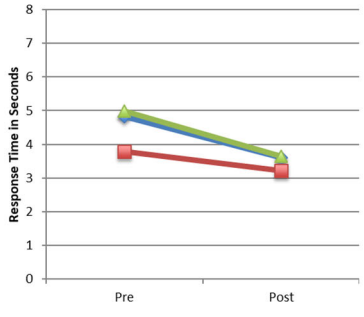


Accuracy

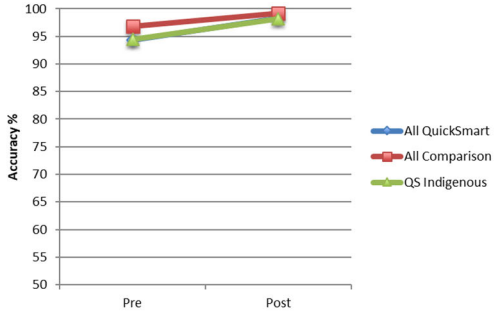


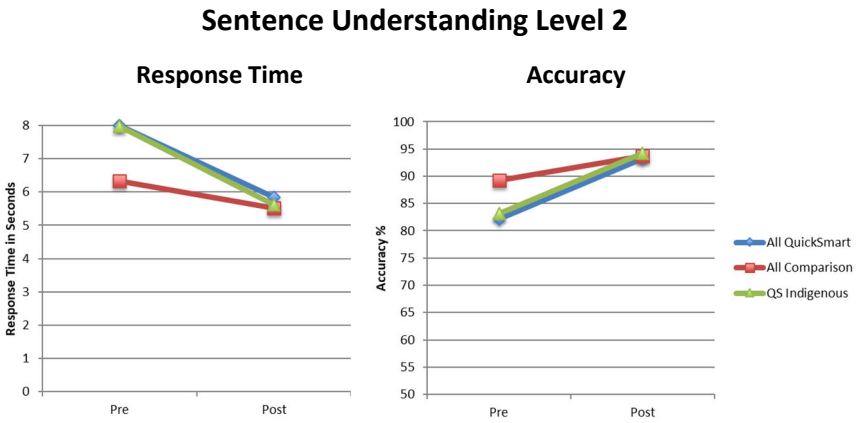
Sentence Understanding Level 1

Response Time



Accuracy





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

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

A mark of the success of *QuickSmart* is that many of these students **did** complete all 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 – 2021

	Mean	Std. Deviation
Essential Words		
Response time (seconds)	0.919	0.194
Accuracy (%)	100	0
Level 1 Words		
Response time (seconds)	5.162	3.774
Accuracy (%)	63.683	17.957
Level 2 Words		
Response time (seconds)	3.328	2.357
Accuracy (%)	79.908	20.982
Level 3 Words		
Response time (seconds)	6.630	4.083
Accuracy (%)	48.436	30.845
Sentence Understanding Level 1		
Response time (seconds)	6.074	3.701
Accuracy (%)	94.592	10.749
Sentence Understanding Level 2		
Response time (seconds)	8.412	3.706
Accuracy (%)	85.113	19.789

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 at the end of the program were below 5.2 seconds, with accuracy results of above 63%. In Level 2 Words, the average response rates were below 3.4 seconds, with average accuracy above 79%.

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 in Sentence Understanding Level 2 are encouraging with response times below 8.5 seconds and accuracy over 85% at post-test. It is likely that part of this improvement may be since:

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

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 these students, as reading is a vital skill underpinning learning in general.

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

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

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

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

5 Independent Assessments

5.1 Why They are Used

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

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

Table 15 reports the analysis of the PAT data for all students for whom paired data were available. PAT analyses for individual 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 Scale scores, which were used for all subsequent calculations. Two analyses are reported in Table 15.

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

Table 15: PAT-V and PAT-C results – (Scale scores) 2021

Group	Average Gain score	Significance	Effect size
Vocabulary			
All *QuickSmart*	5.480	<0.001*	0.537
All Comparison	4.664	<0.001*	0.384
Comprehension			
All *QuickSmart*	4.659	<0.001*	0.453
All Comparison	3.213	<0.001*	0.307

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

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

Table 16: PAT-V and PAT-C results – by Gender (Scale scores) 2021

Gender	Average Gain score	Significance	Effect size
Vocabulary			
QuickSmart Male	4.809	<0.001*	0.444
Comparison Male	4.797	0.002	0.432
QuickSmart Female	6.214	<0.001*	0.657
Comparison Female	4.467	0.032	0.324
Comprehension			
QuickSmart Male	4.241	<0.001*	0.407
Comparison Male	4.334	<0.001*	0.443
QuickSmart Female	5.120	<0.001*	0.511
Comparison Female	1.673	0.193	0.149

In terms of Scale scores, the results indicate that female *QuickSmart* students improved more than male *QuickSmart* students in both vocabulary and comprehension. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level (p = 0.253 for vocabulary and 0.242 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) 2021

Group	Average Gain score	Significance	Effect size
Vocabulary			
Indigenous *QuickSmart*	3.568	0.042	0.357
All Comparison	4.664	<0.001*	0.384
Comprehension			
Indigenous *QuickSmart*	4.015	<0.001*	0.354
All Comparison	3.213	<0.001*	0.307

With respect to Vocabulary, the Indigenous students' results show less improvement than the overall QuickSmart group or the comparison group. The Indigenous students' Comprehension results show an improvement in excess of that achieved by the comparison group.

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

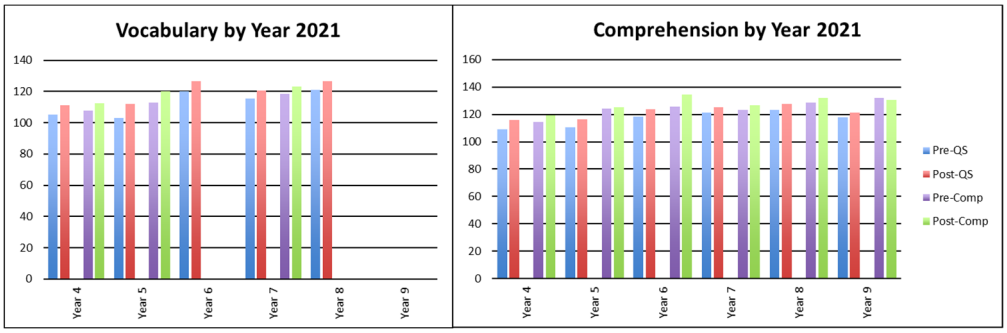


Figure 2: PAT-V and PAT-C by Year

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

Table 18: Percentage students with PAT Gain

Student Type	N with gain	N with PAT	Percentage with Gain
Vocabulary			
QuickSmart	198	272	72.8
Comparison	32	45	71.1
Comprehension			
QuickSmart	417	599	69.6
Comparison	77	121	63.6

These results show that in the *QuickSmart* group, a greater percentage of students achieved gain in PAT than in the comparison group of their average-achieving peers.

6 Conclusion to Report

The support provided by Schools and Clusters of Schools has been critical in making more positive the hopes and aspirations of students participating in the *QuickSmart* program. This report has focused on both the quantitative and qualitative aspects of the program. In all quantitative analyses, the data report a narrowing of the achievement gap between *QuickSmart* students and their average-performing comparison group peers. Impressive effect sizes have been reported with highly significant gains by individual students, some who, 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 about students' attitudes to their attendance and levels of academic confidence both inside and outside the classroom.

The data collected to date from many thousands of *QuickSmar*t students indicate that the narrowing of the achievement gap between *QuickSmart* and comparison students is more than possible and results record low-achieving students proceeding with their studies more successfully by learning to 'trust their heads' in the same ways that effective learners do. Importantly, previous *QuickSmart* studies (references at https://simerr.une.edu.au/quicksmart/publications/) demonstrate that *QuickSmart* students can maintain the gains made during the program for years after they completed the program, especially if ideas are reinforced in the classroom. Analyses have consistently identified impressive statistically significant end-of-program and longitudinal gains in terms of probability measures and effect sizes that mirror qualitative improvements reported by teachers, paraprofessionals, parents and *QuickSmart* students.

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

Professor John Pegg

7 APPENDIX A: Independent Assessment Results

7.1 PAT Results by Region – (Scale Scores) 2021

Note: this has been excluded as vast majority (70%) of participants have an undefined region.

7.2 PAT Results – by Demographic (Scale Scores) 2021

Demographic	Pre-Intervention		Post-Intervention				
	Mean	SD	Mean	SD	Gain	p	Effect size
All Schools Vocabulary – *QuickSmart* Group	**114.635**	**10.140**	**120.115**	**10.261**	**5.480**	**<0.001***	**0.537**
All Schools Vocabulary – Comparison Group	**115.560**	**11.898**	**120.224**	**12.402**	**4.664**	**<0.001***	**0.384**
All Schools Comprehension – *QuickSmart* Group	**119.293**	**10.014**	**123.952**	**10.535**	**4.659**	**<0.001***	**0.453**
All Schools Comprehension – Comparison Group	**123.685**	**9.945**	**126.898**	**10.929**	**3.213**	**<0.001***	**0.307**
Vocabulary – *QuickSmart* Indigenous	112.641	9.534	116.209	10.426	3.568	0.042	0.357
Comprehension – *QuickSmart* Indigenous	116.753	10.518	120.768	12.111	4.015	<0.001*	0.354
Vocabulary – *QuickSmart* Male	115.537	10.397	120.346	11.251	4.809	<0.001*	0.444
Vocabulary – Comparison Male	116.470	11.305	121.267	10.882	4.797	0.002	0.432
Vocabulary – *QuickSmart* Female	113.649	9.797	119.863	9.095	6.214	<0.001*	0.657
Vocabulary – Comparison Female	114.194	12.947	118.661	14.582	4.467	0.032	0.324
Comprehension – *QuickSmart* Male	118.467	10.037	122.708	10.772	4.241	<0.001*	0.407
Comprehension – Comparison Male	122.119	9.344	126.453	10.212	4.334	<0.001*	0.443
Comprehension – *QuickSmart* Female	120.204	9.926	125.324	10.109	5.120	<0.001*	0.511
Comprehension – Comparison Female	125.835	10.427	127.508	11.922	1.673	0.193	0.149

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

7.3 PAT Results – by State (Scale Scores) 2021

Demographic	Pre-Intervention		Post-Intervention				
	Mean	SD	Mean	SD	Gain	p	Effect size
NSW Vocabulary - *QuickSmart* Group	114.793	11.068	119.628	10.711	4.835	<0.001*	0.444
NSW Vocabulary - Comparison Group	108.320	13.003	113.327	16.495	5.007	0.005	0.337
NSW Comprehension - *QuickSmart* Group	119.819	11.052	124.569	11.944	4.750	<0.001*	0.413
NSW Comprehension - Comparison Group	119.731	13.792	122.003	14.936	2.272	0.229	0.158
Qld Vocabulary - *QuickSmart* Group	118.000	8.898	129.373	9.311	11.373	0.002	1.249
Qld Vocabulary - Comparison Group	114.567	8.607	119.383	5.330	4.816	0.240	0.673
Qld Comprehension - *QuickSmart* Group	118.159	10.421	121.871	8.875	3.712	<0.001*	0.384
Qld Comprehension - Comparison Group	128.093	6.734	130.445	6.503	2.352	0.016	0.355
SA Comprehension - *QuickSmart* Group	113.272	7.429	119.688	6.051	6.416	<0.001*	0.947
Vic Vocabulary - *QuickSmart* Group	114.032	8.675	119.874	9.219	5.842	<0.001*	0.653
Vic Vocabulary - Comparison Group	120.333	9.673	124.746	8.360	4.413	0.019	0.488
Vic Comprehension - *QuickSmart* Group	120.376	8.181	125.121	9.776	4.745	<0.001*	0.526
Vic Comprehension - Comparison Group	123.217	6.704	127.472	9.969	4.255	0.010	0.501
WA Comprehension - *QuickSmart* Group	115.827	3.825	123.609	6.393	7.782	0.003	1.477
WA Comprehension - Comparison Group	119.950	8.335	127.100	4.751	7.150	0.078	1.054

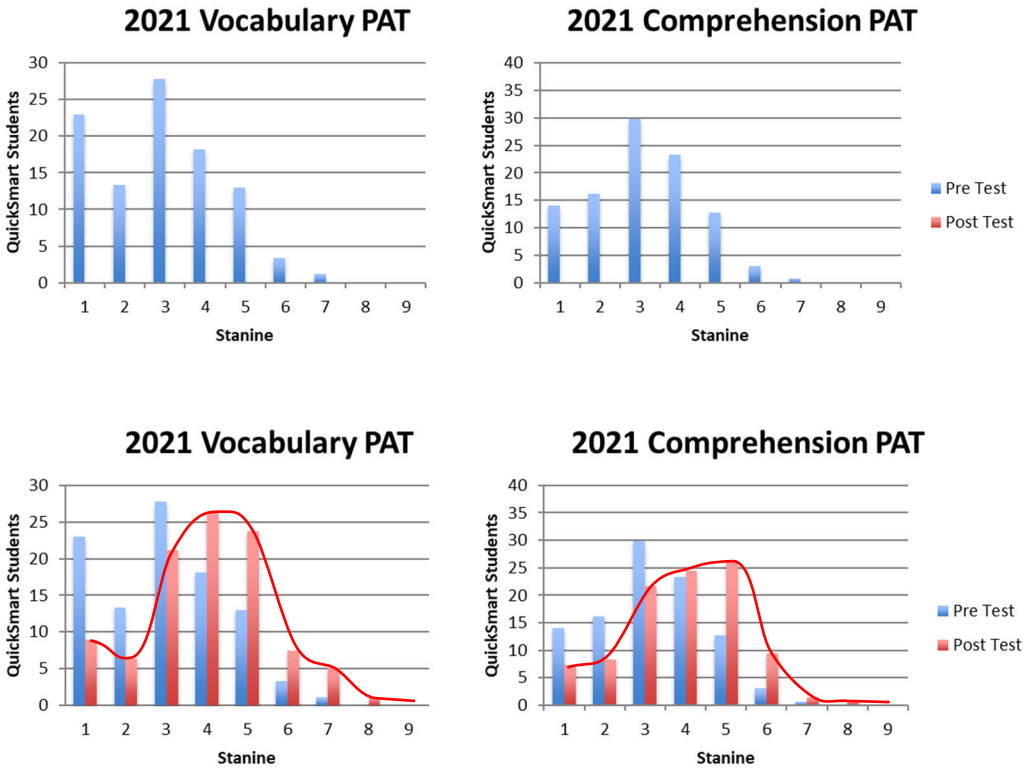
Note: only students who did both 'pre' and 'post' test are included in the table. Groups with less than 5 students are excluded.

7.4 PAT Results – by Year (Scale Scores) 2021

Year	Pre-Intervention		Post-Intervention				
	Mean	SD	Mean	SD	Gain	p	Effect size
Year 4 Vocabulary – *QuickSmart* Group	105.023	10.117	111.215	7.049	6.192	0.007	0.710
Year 4 Vocabulary – Comparison Group	107.738	13.943	112.631	17.653	4.893	0.015	0.308
Year 4 Comprehension – *QuickSmart* Group	109.097	6.960	116.152	5.868	7.055	<0.001*	1.096
Year 4 Comprehension – Comparison Group	114.494	13.315	119.388	17.606	4.894	0.112	0.314
Year 5 Vocabulary – *QuickSmart* Group	103.014	12.334	111.914	13.630	8.900	0.032	0.685
Year 5 Vocabulary – Comparison Group	112.900	1.600	120.167	5.227	7.267	0.075	1.880
Year 5 Comprehension – *QuickSmart* Group	110.509	11.928	116.588	13.567	6.079	0.003	0.476
Year 5 Comprehension – Comparison Group	124.419	13.73	125.250	13.514	0.831	0.787	0.061
Year 6 Vocabulary – *QuickSmart* Group	120.133	4.384	126.467	3.083	6.334	0.032	1.671
Year 6 Vocabulary – Comparison Group							
Year 6 Comprehension – *QuickSmart* Group	118.329	7.565	123.791	8.936	5.462	<0.001*	0.660
Year 6 Comprehension – Comparison Group	125.820	2.826	134.380	8.901	8.560	0.098	1.296
Year 7 Vocabulary – *QuickSmart* Group	115.459	8.534	120.538	9.427	5.079	<0.001*	0.565
Year 7 Vocabulary – Comparison Group	118.607	9.679	123.133	8.253	4.526	0.013	0.503
Year 7 Comprehension – *QuickSmart* Group	121.110	8.441	125.195	9.709	4.085	<0.001*	0.449
Year 7 Comprehension – Comparison Group	123.075	6.894	126.730	8.447	3.655	0.002	0.474
Year 8 Vocabulary – *QuickSmart* Group	121.129	10.719	126.593	8.868	5.464	<0.001*	0.555
Year 8 Vocabulary – Comparison Group	131.800		133.300		1.500		
Year 8 Comprehension – *QuickSmart* Group	123.225	9.787	127.896	10.193	4.671	<0.001*	0.467
Year 8 Comprehension – Comparison Group	128.735	6.508	131.900	5.631	3.165	0.021	0.520
Year 9 Vocabulary – *QuickSmart* Group							
Year 9 Vocabulary – Comparison Group							
Year 9 Comprehension – *QuickSmart* Group	117.722	14.093	121.439	10.446	3.717	0.098	0.300
Year 9 Comprehension – Comparison Group	132.144	5.983	130.789	6.032	-1.355		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 5-11% of the population
- 3 represents performance in the lower 12-23% of the population
- 4 represents performance in the lower 24-40% of the population
- 5 represents performance in middle 41-60% of the population
- 6 represents performance in the higher 61-77% of the population
- 7 represents performance in the higher 78-88% of the population
- 8 represents performance in the higher 89-96% of the population
- 9 represents performance above the top 4% of the population.

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

7.6 PAT Vocabulary Results by Percentile

Demographic	Mean Percentile		
	Pre	Post	Gain
All *QuickSmart*	**21.21**	**34.94**	**13.73**
All Comparison	**32.87**	**45.36**	**12.49**
Indigenous *QuickSmart*	15.78	24.80	9.02
QuickSmart Female	18.30	33.32	15.02
Comparison Female	35.33	45.11	9.78
QuickSmart Male	23.89	36.43	12.54
Comparison Male	31.22	45.52	14.30
Year			
QuickSmart Year 4	31.69	46.38	14.69
Comparison Year 4	40.77	53.85	13.08
QuickSmart Year 5	16.19	35.86	19.67
Comparison Year 5	33.00	50.00	17.00
QuickSmart Year 6	35.00	49.67	14.67
QuickSmart Year 7	20.15	33.49	13.34
Comparison Year 7	27.41	39.93	12.52
QuickSmart Year 8	26.43	38.00	11.57
Lessons attended			
<=20	23.14	37.76	14.62
21-40	22.67	32.24	9.57
41-60	20.71	38.01	17.30
61-80	14.70	36.37	21.67

7.7 PAT Comprehension Results by Percentile

Demographic	Mean Percentile			
	N	Pre	Post	Gain
All *QuickSmart*	**562**	**22.86**	**33.41**	**10.55**
All Comparison	**107**	**34.37**	**43.05**	**8.68**
Indigenous *QuickSmart*	65	18.28	27.89	9.61
QuickSmart Female	267	24.47	36.13	11.66
Comparison Female	45	40.87	45.62	4.75
QuickSmart Male	295	21.40	30.95	9.55
Comparison Male	62	29.66	41.18	11.52
Year				
QuickSmart Year 4	29	27.48	38.21	10.73
Comparison Year 4	16	41.50	50.19	8.69
QuickSmart Year 5	56	18.91	30.91	12.00
Comparison Year 5	16	48.44	52.31	3.87
QuickSmart Year 6	26	22.88	41.00	18.12
Comparison Year 6	5	39.80	63.60	23.80
QuickSmart Year 7	347	23.75	34.00	10.25
Comparison Year 7	39	25.85	37.05	11.20
QuickSmart Year 8	74	20.93	31.20	10.27
Comparison Year 8	20	30.70	39.90	9.20
QuickSmart Year 9	18	10.22	12.67	2.45
Comparison Year 9	9	33.89	29.78	no improvement
Lessons attended				
<=20	42	23.55	27.62	4.07
21-40	263	24.09	36.21	12.12
41-60	171	23.26	33.14	9.88
61-80	66	19.98	31.92	11.94
80+	18	10.28	15.83	5.55