SiMERR National Research Centre

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University of New England

Annual Literacy Program Report 2016

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

quicksmart

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1 *QuickSmart* Executive Summary in 2016

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

Three issues confront schools in Australia with regard to addressing the needs of at-risk students.

1. Too many Australian Indigenous and non-Indigenous students have shown to be resistant to improvements in learning despite large investments of funds to overcome their problems. Longitudinal national data indicate that low-achieving students have not drawn lasting benefits from most current in-class and withdrawal instructional activities.
2. Teaching assistants are an underutilised, poorly supported, and seldom recognised resource in school education. With appropriate training these adults are highly motivated, and offer cost-effective, long-term sustainable ways to close the achievement gap for low-achieving students. In remote and rural areas, trained Indigenous teaching assistants (as *QuickSmart* Instructors) are a resource able to enrich their whole community.
3. Educational support programs need to be sustainable in the short- and long-term without large drains on the public purse. Sustainability means cost-efficient, clear exit criteria, proven longitudinal results, documented ongoing benefits for students and instructors, and replicable (including quality assurance) across all regions of Australia.

The analyses presented in this report provide information about students' performance in the QuickSmart Numeracy program. In particular, the focus here is on the Cognitive Aptitude Assessment System, Australian version (OZCAAS) and on standardised test measures, specifically the Progressive Achievement Tests in Vocabulary (V) and Comprehension (C) (ACER, 2005). Some schools provided data for other independent tests, however, there was insufficient use of these tests for inclusion in this report. Further investigation of the data provided in this report examines the results in terms of gender and for the participating Indigenous students.

In 2016, the *QuickSmart* team at the University of New England received data from 1363 students who participated in *QuickSmart* Literacy lessons and 249 average-achieving comparison peers. These students were drawn from schools from 19 regions around Australia. Further data were also submitted for independent analysis to the Northern Territory (NT) Department of Education and Training by NT schools.

In terms of the OZCAAS (a random letter and word computer generated testing approach that measures the time and the accuracy of basic literacy) the results for Vocabulary and Comprehension indicate a strong to substantial improvement for the *QuickSmart* students in terms of accuracy and response time. The diagrammatic evidence illustrates that the *QuickSmart* students narrowed the achievement gap between them and their comparison group peers.

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

Some small differences between male and female students were observed. However, these differences were not statistically significant. As a result, these data do not warrant further investigation.

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

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

The results are impressive given that these students did not have the skills or confidence to complete the OZCAAS pre-tests initially. In Essential Words and Level 1 Words, the average response rates at the end of the program were below two seconds, with accuracy results above 92%. In Level 2 Words, the average response rates were close to 2 seconds, with average accuracy above 83%.

In Comprehension Level 1, the average response rates were below 5 seconds, with average accuracy above 95%. 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 3.9 seconds and accuracy over 68% 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.

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. Two analyses were undertaken on the PAT scores.

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

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

In terms of Scale scores derived from the PAT-V and PAT-C tests, the results indicate that male *QuickSmart* students improved slightly more in vocabulary compared to female *QuickSmart* students, and female students improved more in comprehension The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level ($p = 0.579$ for vocabulary and 0.298 for comprehension).

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

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

Additionally, substantial qualitative data (reported in school presentations during professional workshops 2 and 3) indicate that *QuickSmart* students gained a new confidence in the area of mathematics. Many stories within the corpus of qualitative data document improvements for *QuickSmart* students not only in relation to their performance in class, but also with regard to students' attitudes to school, their attendance rates and levels of academic confidence both inside and outside the classroom.

The data collected to date from tens of thousands of *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 the strategic use of mental and other resources. In *QuickSmart*, the aim is to improve students' information retrieval times to levels that free working-memory capacity from an excessive focus on mundane or routine tasks. In this way, students are able to engage meaningfully with more demanding cognitive activities. In these interventions, automaticity is fostered; time, accuracy and understanding are incorporated as key dimensions of learning; and an emphasis is placed on ensuring maximum student on-task time. *QuickSmart* lessons develop learners' abilities to monitor their academic learning and set realistic goals for themselves.

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

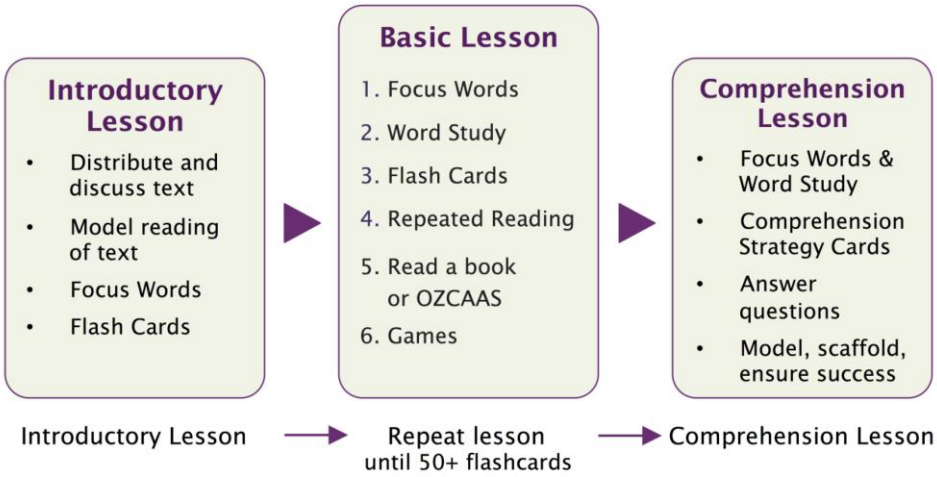


Figure 1: *QuickSmart* Literacy lesson structures

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

3 *QuickSmart* Tests – 2016

3.1 Introduction

Three major sets of analyses help quantify the academic benefits of the *QuickSmart* program. These analyses are presented in this report and provide information about students' performance:

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

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

Six tests measured students' response time and accuracy both before *QuickSmart* began and at the end of the program. The tests were:

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

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

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

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

3.2 Background to Test Interpretation

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

with comparison students achieving better average pre-intervention scores than students in the *QuickSmart* group.

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

Additionally, as *QuickSmart* programs become established in schools, sometimes even within the first year of operation, it becomes increasingly difficult to establish even a true 'comparison' group. This occurs as more and more *QuickSmart* practitioners are sharing *QuickSmart* teaching practices, resources and activities throughout their schools. Our information from school reports is that a majority of Principals begin this school wide implementation of *QuickSmart* in their schools within the first two years. While this attests to the impact that *QuickSmart* is having in schools, it does not allow a straightforward interpretation of results. Specifically, in many schools average-achieving comparison students are receiving some experience with *QuickSmart* approaches, activities and resources in their classrooms, and consequently their scores are higher at post-test because of this exposure.

It should also be noted that in order to obtain the difference between the improvement of *QuickSmart* students and comparison students we analysed the data using paired-samples *t*-tests. To protect against the cascading Type I error associated with multiple *t*-tests we lowered the significance level from the customary 0.05 to 0.01. (The reason for this is to adjust for the situation where *t*-tests are repeated many times. This repetition means that, on average, the decision that the means of two groups are significantly different would be incorrect one time in every one hundred replications.) This means that in our analysis for any two means to be judged significantly different from each other, there has to be a less than 1% chance that the result was obtained by chance.

4 Results on the OZCAAS Assessments

4.1 Introduction

In 2016, the *QuickSmart* team at the University of New England received data from 1363 students who participated in *QuickSmart* Literacy lessons and 249 average-achieving comparison peers. These students were drawn from schools from 19 regions around Australia. Further data were also submitted for independent analysis to the Northern Territory (NT) Department of Education and Training by NT schools.

To assist with interpretation of these results, Level 3 Words and Comprehension Level 2 are shown first, as these tests show the effect of the program most clearly. It is important to note that interpretation of results in some tests (e.g., Essential Words) can be impacted by a 'ceiling effect' as many students record strong results at pre-test and this does not leave much room for improvement. The OZCAAS results recorded for average-achieving comparison students should also be interpreted with the knowledge that many of these students' results are constrained by a ceiling effect.

The results of our analyses of data related to OZCAAS are presented in Tables 1 to 6 below. Detailed discussions of Tables 1 and 2 are provided for clarification purposes and as a model for understanding the results provided in Tables 3 to 6.

4.2 Combined OZCAAS Analysis

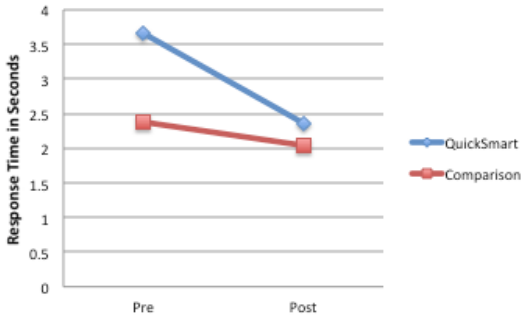
Table 1 summarises the data submitted for OZCAAS Level 3 Words.

4.2.1 Level 3 Words

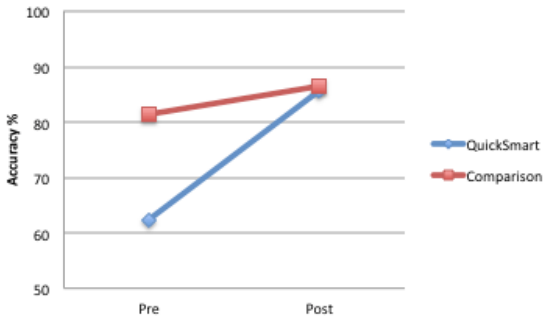
Table 1: OZCAAS Level 3 Words results – all students 2016

Level 3 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	1093	3.655	2.386	2.363	1.870	-1.292	<0.001*	0.603
Res Time (secs) Comp	222	2.375	1.745	2.036	1.388	-0.339	<0.001*	0.215
Accuracy (%) QS	1093	62.413	24.182	85.772	18.940	23.359	<0.001*	1.075
Accuracy (%) Comp	222	81.314	17.382	86.577	14.940	5.263	<0.001*	0.325

Level 3 Words Response Time



Level 3 Words Accuracy



On the Level 3 Words test, there were paired data for 1093 *QuickSmart* students and 222 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 1.292 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 0.603, which indicates very strong improvement.

Effect size statistics can be understood based on the work of Hattie (Hattie, J. 2009. *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement.* London: Routledge) such that over an academic year for a student cohort:

- Effect sizes below 0.2 are considered **poor**;
- Effect sizes within the range of 0.2 to 0.4 are considered **appropriate**;
- Effect sizes within the range of 0.4 to 0.6 are considered **strong**;
- Effect sizes within the range of 0.6 and 0.8 are considered **very strong**; and
- Effect sizes above 0.8 are considered **substantial improvement** of the order of nearly three years' growth.

In terms of accuracy, the *QuickSmart* students' average scores have improved by over 23 percentage points, which is a very strong result. The effect size of 1.075, 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 diagrams illustrate the narrowing of the gap between the *QuickSmart* students and comparison students as a result of the *QuickSmart* intervention.

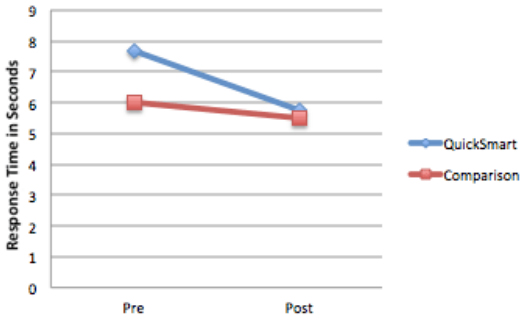
4.2.2 Comprehension Level 2

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

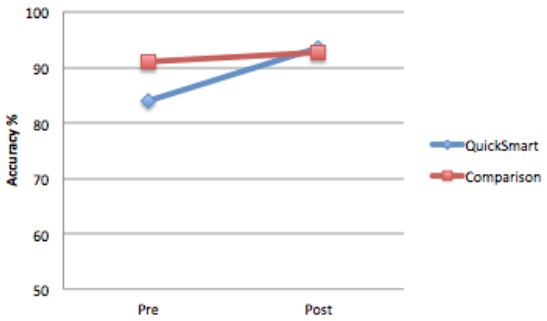
Table 2: OZCAAS Comprehension Level 2 – all students 2016

Comprehension Level 2	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	1101	7.658	3.011	5.751	2.520	-1.907	<0.001*	0.687
Res Time (secs) Comp	223	6.002	2.525	5.500	1.803	-0.502	<0.001*	0.229
Accuracy (%) QS	1101	83.935	13.837	93.637	9.409	9.702	<0.001*	0.82
Accuracy (%) Comp	223	91.035	8.832	92.756	7.298	1.721	0.006	0.212

Comprehension Level 2 Response Time



Comprehension Level 2 Accuracy



On the Comprehension Level 2 test, there were paired data for 1101 *QuickSmart* students and 223 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

1.907 seconds, which is a strong result. The effect size for this result is 0.687, which indicates very strong improvement.

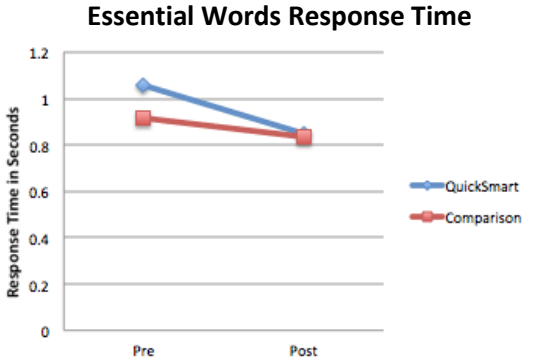
In terms of accuracy, the *QuickSmart* students' average scores have improved by nearly 10 percentage points, which is a strong result. The effect size is 0.82, which indicates substantial improvement for the *QuickSmart* group.

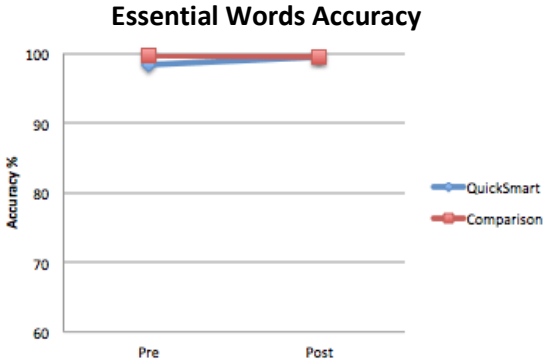
In summary, Table 2 shows that when compared to the scores of the comparison students, *QuickSmart* students' scores indicate greater improvement in terms of response time and accuracy in comprehension. The diagrams illustrate that as a result of the *QuickSmart* intervention, the *QuickSmart* students 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.

4.2.3 Essential Words

Table 3: OZCAAS Essential Words – all students 2016

Essential Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	p	Effect size
Res Time (secs) QS	1151	1.059	0.555	0.849	0.356	-0.21	<0.001*	0.45
Res Time (secs) Comp	202	0.917	0.287	0.835	0.231	-0.082	<0.001*	0.315
Accuracy (%) QS	1151	98.440	5.226	99.488	4.475	1.048	<0.001*	0.215
Accuracy (%) Comp	202	99.710	1.213	99.586	1.415	-0.124		no improvement





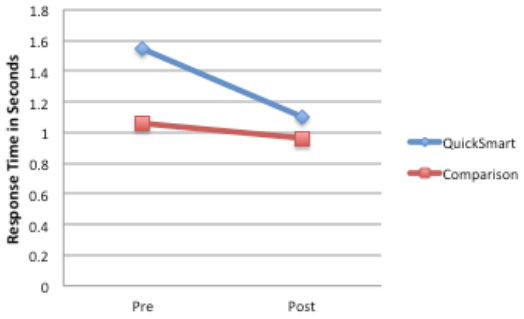
In summary, the results for Essential Words, the most commonly used words that should be known by middle school students, indicate a stronger improvement for the *QuickSmart* students than for the comparison students. However, both the response time and accuracy results show a strong ceiling effect as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

4.2.4 Level 1 Words

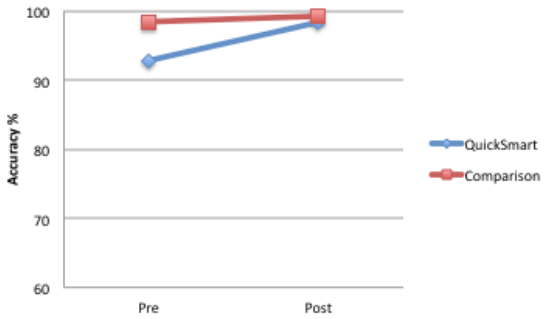
Table 4: OZCAAS Level 1 Words – all students 2016

Level 1 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	1233	1.547	1.156	1.103	0.668	-0.444	<0.001*	0.47
Res Time (secs) Comp	219	1.065	0.400	0.964	0.297	-0.101	<0.001*	0.287
Accuracy (%) QS	1233	92.883	12.093	98.400	5.855	5.517	<0.001*	0.581
Accuracy (%) Comp	219	98.512	3.930	99.354	1.987	0.842	0.002	0.27

Level 1 Words Response Time



Level 1 Words Accuracy



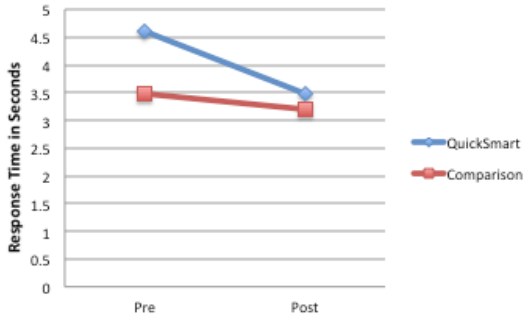
In summary, the results for Level 1 Words indicate a strong improvement for the *QuickSmart* students. The diagrams illustrate that as a result of the *QuickSmart* intervention, the *QuickSmart* students narrowed the gap to the comparison students in response time. In accuracy, they improved to such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

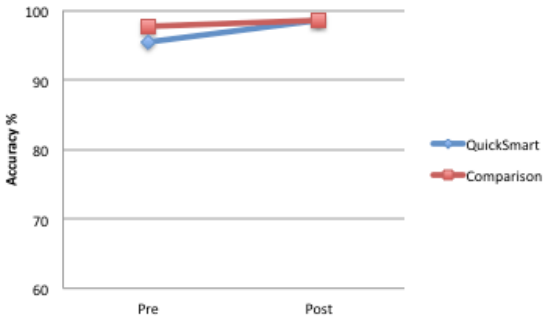
Table 5: OZCAAS Comprehension Level 1 – all students 2016

Comprehension Level 1	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	1173	4.592	1.995	3.481	1.498	-1.111	<0.001*	0.63
Res Time (secs) Comp	224	3.474	1.288	3.194	0.877	-0.28	<0.001*	0.254
Accuracy (%) QS	1173	95.521	7.486	98.559	4.347	3.038	<0.001*	0.496
Accuracy (%) Comp	224	97.787	6.977	98.682	3.322	0.895	0.087	0.164

Comprehension Level 1 Response Time



Comprehension Level 1 Accuracy

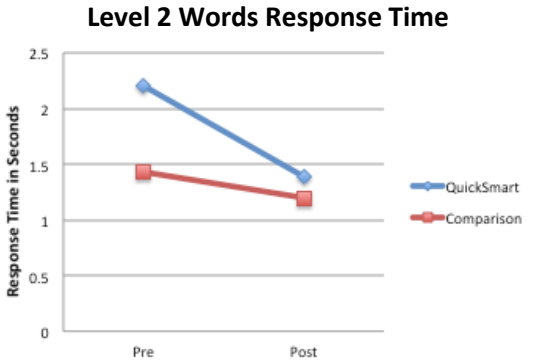


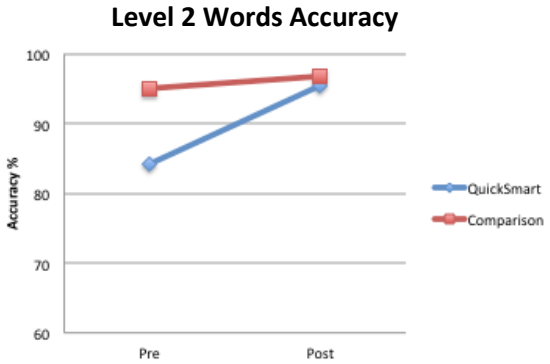
In summary, the results for Comprehension Level 1 indicate a strong improvement for the *QuickSmart* students. The diagrams illustrate that the *QuickSmart* students narrowed the gap to the comparison students in response time. In accuracy, they improved to such an extent that there was no substantial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

4.2.6 Level 2 Words

Table 6: OZCAAS Level 2 Words – all students 2016

Level 2 Words	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Res Time (secs) QS	1202	2.205	1.679	1.388	0.946	-0.817	<0.001*	0.6
Res Time (secs) Comp	223	1.426	1.018	1.198	0.456	-0.228	<0.001*	0.289
Accuracy (%) QS	1202	84.137	16.794	95.526	9.870	11.389	<0.001*	0.827
Accuracy (%) Comp	223	95.108	7.060	96.785	5.003	1.677	<0.001*	0.274





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

4.3 OZCAAS By Demographics

4.3.1 Essential Words by Gender

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

Table 7: OZCAAS Essential Words results – all students by gender 2016

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (res time)	654	1.065	0.610	0.845	0.348	-0.22	<0.001*	0.443
Male COMP (res time)	102	0.899	0.259	0.814	0.192	-0.085	0.003	0.373
Female QS (res time)	497	1.051	0.473	0.855	0.367	-0.196	<0.001*	0.463
Female COMP (res time)	100	0.935	0.314	0.857	0.265	-0.078	0.027	0.268
Male QS (accuracy)	654	98.534	4.090	99.462	4.326	0.928	<0.001*	0.22
Male COMP (accuracy)	102	99.584	1.433	99.645	1.314	0.061	0.724	0.044
Female QS (accuracy)	497	98.315	6.423	99.523	4.668	1.208	0.001	0.215
Female COMP (accuracy)	100	99.838	0.926	99.526	1.516	-0.312		no improvement

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. However, care should be exercised in interpreting these results because they exhibit a strong ceiling effect.

4.3.2 Level 1 Words by Gender

Table 8: OZCAAS Level 1 Words results – all students by gender 2016

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (res time)	694	1.543	1.149	1.108	0.684	-0.435	<0.001*	0.46
Male COMP (res time)	108	1.044	0.364	0.955	0.283	-0.089	0.009	0.273
Female QS (res time)	539	1.552	1.166	1.098	0.647	-0.454	<0.001*	0.481
Female COMP (res time)	111	1.087	0.433	0.973	0.311	-0.114	0.002	0.302
Male QS (accuracy)	694	92.428	12.567	98.104	7.058	5.676	<0.001*	0.557
Male COMP (accuracy)	108	98.372	3.406	99.273	2.182	0.901	0.013	0.315
Female QS (accuracy)	539	93.469	11.438	98.781	3.754	5.312	<0.001*	0.624
Female COMP (accuracy)	111	98.648	4.391	99.433	1.783	0.785	0.049	0.234

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 slightly more than the females. However, care should be exercised in interpreting these results because they exhibit a strong ceiling effect.

4.3.3 Comprehension Level 1 by Gender

Table 9: OZCAAS Comprehension Level 1 results – all students by gender 2016

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (res time)	666	4.626	2.008	3.526	1.619	-1.1	<0.001*	0.603
Male COMP (res time)	111	3.508	1.362	3.243	0.91	-0.265	0.014	0.229
Female QS (res time)	507	4.547	1.980	3.423	1.320	-1.124	<0.001*	0.668
Female COMP (res time)	113	3.441	1.217	3.146	0.845	-0.295	0.001	0.282
Male QS (accuracy)	666	95.658	7.417	98.410	4.388	2.752	<0.001*	0.452
Male COMP (accuracy)	111	97.305	9.121	97.842	4.098	0.537	0.581	0.076
Female QS (accuracy)	507	95.342	7.579	98.754	4.329	3.412	<0.001*	0.553
Female COMP (accuracy)	113	98.26	3.842	99.507	2.024	1.247	0.002	0.406

In summary, the results of *QuickSmart* students show that in both 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 = 0.834 for response time and 0.112 for accuracy).

4.3.4 Level 2 Words by Gender

Table 10: OZCAAS Level 2 Words results – all students by gender 2016

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (res time)	685	2.162	1.687	1.383	0.995	-0.779	<0.001*	0.562
Male COMP (res time)	111	1.319	0.642	1.186	0.442	-0.133	0.013	0.241
Female QS (res time)	517	2.262	1.669	1.395	0.879	-0.867	<0.001*	0.65
Female COMP (res time)	112	1.532	1.281	1.211	0.472	-0.321	0.002	0.333
Male QS (accuracy)	685	83.791	17.812	95.175	10.793	11.384	<0.001*	0.773
Male COMP (accuracy)	111	95.157	6.726	96.767	5.465	1.61	0.007	0.263
Female QS (accuracy)	517	84.595	15.345	95.992	8.481	11.397	<0.001*	0.919
Female COMP (accuracy)	112	95.06	7.406	96.803	4.523	1.743	0.011	0.284

In summary, the results of *QuickSmart* students show that in both 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 = 0.307 for response time and 0.970 for accuracy).

4.3.5 Comprehension Level 2 by Gender

Table 11: OZCAAS Comprehension Level 2 results – all students by gender 2016

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (res time)	629	7.588	3.011	5.703	2.562	-1.885	<0.001*	0.674
Male COMP (res time)	112	5.984	2.583	5.504	1.846	-0.48	0.013	0.214
Female QS (res time)	472	7.751	3.013	5.816	2.463	-1.935	<0.001*	0.703
Female COMP (res time)	111	6.02	2.476	5.496	1.766	-0.524	0.008	0.244
Male QS (accuracy)	629	83.864	14.180	93.428	9.952	9.564	<0.001*	0.781
Male COMP (accuracy)	112	90.604	8.812	91.974	8.142	1.37	0.141	0.161
Female QS (accuracy)	472	84.029	13.382	93.917	8.635	9.888	<0.001*	0.878
Female COMP (accuracy)	111	91.469	8.87	93.545	6.272	2.076	0.012	0.27

In summary, the results of *QuickSmart* students show that in both 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 = 0.932 for response time and 0.434 for accuracy).

4.3.6 Level 3 Words by Gender

Table 12: OZCAAS Level 3 Words results – all students by gender 2016

Group	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Male QS (res time)	629	3.473	2.314	2.284	1.930	-1.189	<0.001*	0.558
Male COMP (res time)	110	2.21	1.555	1.953	1.288	-0.257	0.023	0.18
Female QS (res time)	464	3.902	2.460	2.470	1.783	-1.432	<0.001*	0.667
Female COMP (res time)	112	2.537	1.907	2.117	1.482	-0.42	0.001	0.246
Male QS (accuracy)	629	63.290	25.114	86.104	18.743	22.814	<0.001*	1.03
Male COMP (accuracy)	110	81.585	17.469	86.918	15.615	5.333	<0.001*	0.322
Female QS (accuracy)	464	61.225	22.831	85.321	19.215	24.096	<0.001*	1.142
Female COMP (accuracy)	112	81.049	17.371	86.242	14.308	5.193	<0.001*	0.326

In summary, the results of *QuickSmart* students show that in both response time and accuracy the females have improved more than the males. The Independent sample *t*-tests showed that these differences are not statistically significant at the 0.01 significance level (p = 0.050 for response time and 0.408 for accuracy).

4.3.7 Indigenous Students

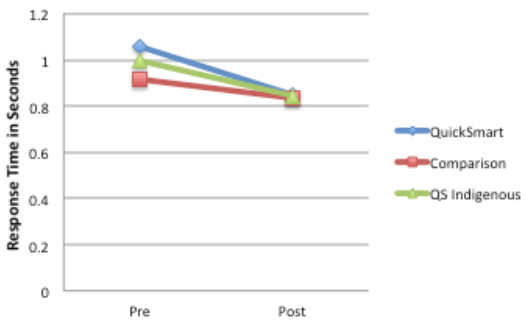
Table 13: OZCAAS results – Indigenous *QuickSmart* students 2016

Test	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Gain	*p*	Effect size
Essential Words (res time)	94	1.000	0.367	0.845	0.381	-0.155	<0.001*	0.414
Essential Words (accuracy)	94	98.306	4.784	99.445	3.018	1.139	.012	0.285
Level 1 Words (res time)	101	1.460	1.093	1.121	0.951	-0.339	<0.001*	0.331
Level 1 Words (accuracy)	101	94.091	11.594	98.078	6.527	3.987	<0.001*	0.424
Comprehension Level 1 (res time)	93	4.218	1.532	3.357	1.553	-0.861	<0.001*	0.558
Comprehension Level 1 (accuracy)	93	96.674	5.717	99.126	2.491	2.452	<0.001*	0.556
Level 2 Words (res time)	100	2.066	1.695	1.292	0.658	-0.774	<0.001*	0.602
Level 2 Words (accuracy)	100	84.556	18.960	95.721	9.642	11.165	<0.001*	0.742
Comprehension Level 2 (res time)	82	7.269	2.313	5.306	2.380	-1.963	<0.001*	0.836
Comprehension Level 2 (accuracy)	82	86.449	12.250	94.441	8.618	7.992	<0.001*	0.755
Level 3 Words (res time)	86	3.688	2.282	2.399	1.656	-1.289	<0.001*	0.647
Level 3 Words (accuracy)	86	69.077	22.549	86.574	18.116	17.497	<0.001*	0.855

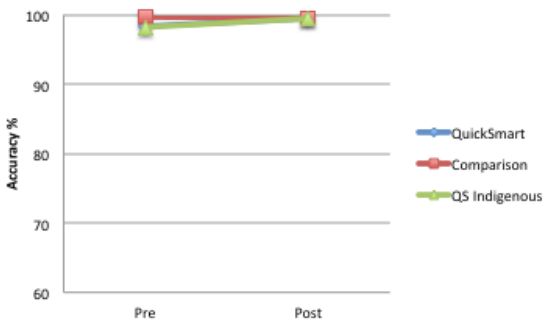
These results indicate that the Indigenous students' gains are comparable to those of the overall *QuickSmart* group. For Essential Words and Level 1 Words, both the response time and accuracy results are limited by the ceiling effect (the pre-intervention scores were so high that the students did not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

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

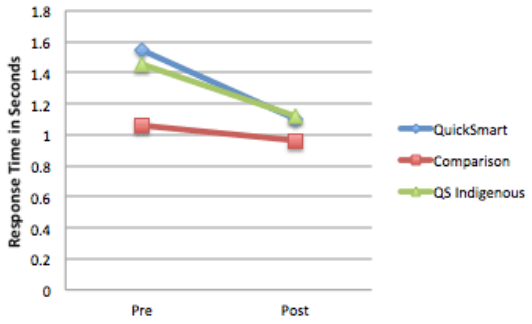
Essential Words Response Time



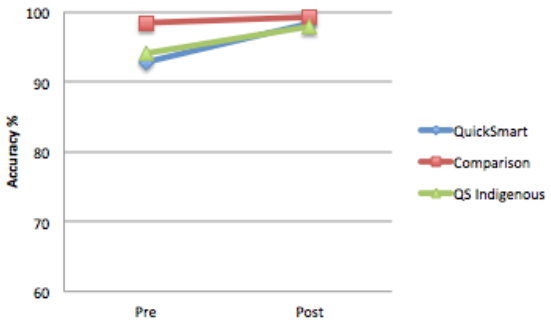
Essential Words Accuracy



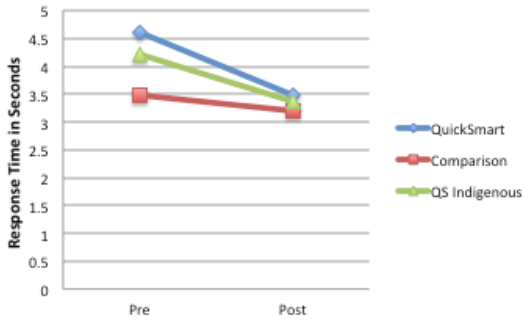
Level 1 Words Response Time



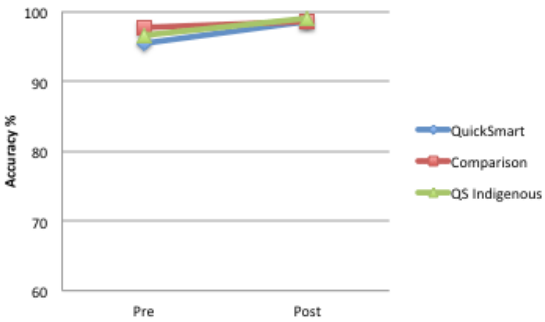
Level 1 Words Accuracy



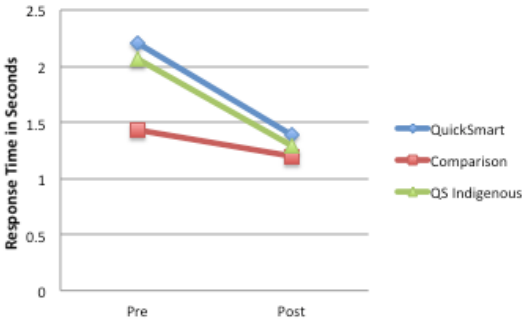
Comprehension Level 1 Response Time



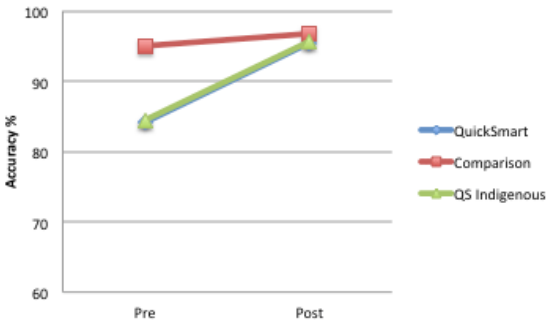
Comprehension Level 1 Accuracy



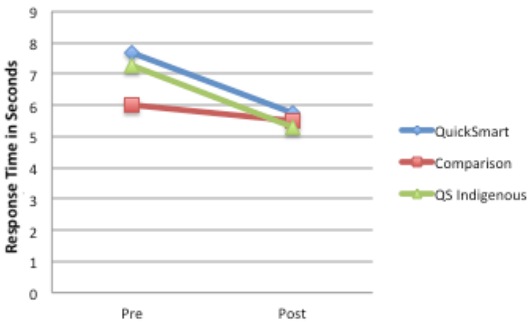
Level 2 Words Response Time



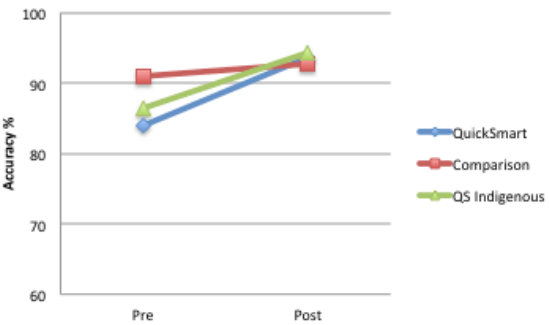
Level 2 Words Accuracy



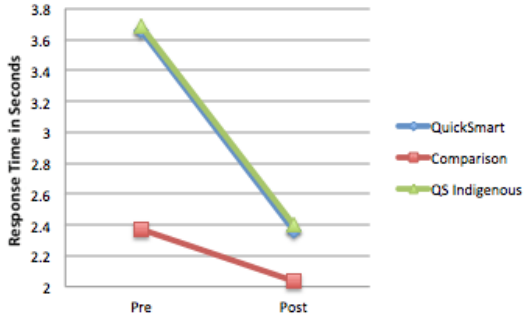
Comprehension Level 2 Response Time



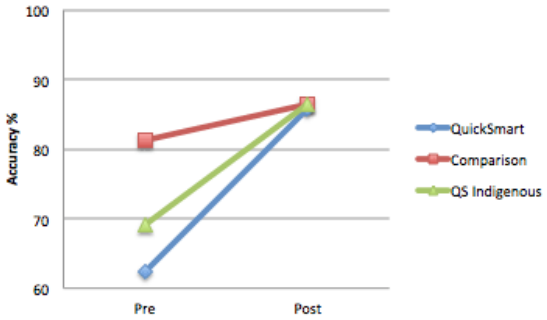
Comprehension Level 2 Accuracy



Level 3 Words Response Time



Level 3 Words 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 – 2016

	N	Mean	Std. Deviation
Essential Words QS (res time)	19	0.924	0.189
Essential Words QS (accuracy)	19	100.000	0.000
Level 1 Words QS (res time)	6	1.301	0.356
Level 1 Words QS (accuracy)	6	92.883	12.790
Comprehension Level 1 QS (res time)	16	4.937	2.592
Comprehension Level 1 QS (accuracy)	16	95.300	8.425
Level 2 Words QS (res time)	44	2.168	1.467
Level 2 Words QS (accuracy)	44	83.714	22.763
Comprehension Level 2 QS (res time)	59	7.670	3.267
Comprehension Level 2 QS (accuracy)	59	86.705	16.462
Level 3 Words QS (res time)	79	3.897	2.432
Level 3 Words QS (accuracy)	79	68.952	26.489

The results in Table 14 are impressive given that these students did not have the skills or confidence to complete the OZCAAS pre-tests initially. In Essential Words and Level 1 Words, the average response rates at the end of the program were below the target of two seconds, with accuracy results above 92%. In Level 2 Words, the average response rates were below 2.2 seconds, with average accuracy above 83%.

In Comprehension Level 1, the average response rates were below 5.0 seconds, with average accuracy above 95%. 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 3.9 seconds and accuracy over 68% 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-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 Scale scores, which were used for all subsequent calculations. Two analyses are reported in Table 15.

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

Table 15: PAT-V and PAT-C results – (Scale scores) 2016

Group	Students with paired data	Average Gain score	Significance	Effect size
All *QuickSmart* Vocabulary	652	7.351	<0.001*	0.709
All Comparison Vocabulary	117	3.699	<0.001*	0.409
All *QuickSmart* Comprehension	896	6.212	<0.001*	0.632
All Comparison Comprehension	208	3.75	<0.001*	0.354

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

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

Table 16: PAT-V and PAT-C results – by Gender (Scale scores) 2016

Gender	Students with paired data	Average Gain score	Significance	Effect size
Vocabulary – QS Male	385	7.532	<0.001*	0.682
Vocabulary – Comp Male	58	3.485	0.011	0.344
Vocabulary – QS Female	267	7.09	<0.001*	0.772
Vocabulary – Comp Female	59	3.91	<0.001*	0.494
Comprehension – QS Male	515	5.941	<0.001*	0.574
Comprehension – Comp Male	98	3.47	0.001*	0.333
Comprehension – QS Female	381	6.577	<0.001*	0.726
Comprehension – Comp Female	110	4.0	<0.001*	0.372

In terms of Scale scores, the results indicate that male *QuickSmart* students improved more in vocabulary compared to female *QuickSmart* students. The female *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 = 0.579 for vocabulary and 0.298 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) 2016

Group	Students with paired data	Average Gain score	Significance	Effect size
Indigenous QS Vocabulary	55	6.742	<0.001*	0.699
All Comparison Vocabulary	117	3.699	<0.001*	0.409
Indigenous QS Comprehension	77	5.753	<0.001*	0.516
All Comparison Comprehension	208	3.75	<0.001*	0.354

These results show strong vocabulary improvement for the Indigenous students who participated in *QuickSmart*. These students were able to report a rate of growth close to that of the total cohort of *QuickSmart* students and in excess of that achieved by the comparison group. The Indigenous students' Comprehension results also show a strong improvement, with the Indigenous students again reporting a growth rate only slightly smaller than that shown by the rest of the *QuickSmart* group and 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 grades targeted by the program, that is Grade 5 through to Grade 8. The tables of figures for these graphs are available in the Appendices.

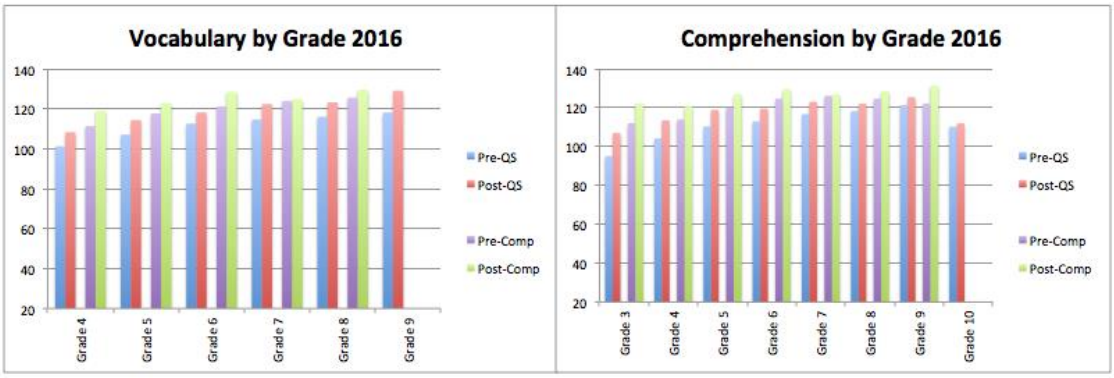


Figure 2: PAT-V and PAT-C by Grade

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

Table 18: Percentage students with PAT Gain

Student Type	N with gain	N with PAT	Percentage with Gain
***QuickSmart* Vocabulary**	512	652	78.5
Comparison Vocabulary	88	117	75.2
***QuickSmart* Comprehension**	693	896	77.3
Comparison Comprehension	138	208	66.3

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

6 Conclusion to Report

The support provided by the Schools and Clusters has been critical in making more positive the hopes and aspirations of students participating in the *QuickSmart* program. This report has focused on the quantitative aspects of the program. In all analyses, the data report a narrowing of the achievement gap between *QuickSmart* students and their average-performing comparison group peers. Impressive effect sizes have been reported as well as highly significant gains on the part of individual students who, in some cases, could not complete the full suite of pre-test assessments.

Additionally, substantial qualitative data (reported in school presentations during professional workshops 2 and 3) indicate that *QuickSmart* students gained a new confidence in the area of literacy learning. Many stories within the corpus of qualitative data document improvements for *QuickSmart* students not only in relation to their performance in class, but also with regard to students' attitudes to school, their attendance rates and levels of academic confidence both inside and outside the classroom.

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

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

Professor John Pegg

7 APPENDIX A: Independent Assessment Results

7.1 PAT Results by Region – (Scale Scores) 2016

Cluster of Schools		Pre-Intervention		Post-Intervention				
	N	Mean	SD	Mean	SD	Gain	p	Effect size
Adelaide Vocab - QS Group	15	115.067	6.713	118.560	6.059	3.493	0.077	0.546
Adelaide Comprehension - QS Group	35	111.511	9.848	118.129	13.181	6.618	0.008	0.569
Ballarat Vocab - QS Group	16	113.100	5.009	120.681	6.433	7.581	<0.001*	1.315
Geelong Vocab - QS Group	34	111.621	9.116	140.506	17.889	28.885	<0.001*	2.035
Geelong Comprehension - QS Group	27	114.474	8.720	120.733	7.766	6.259	0.001	0.758
Gippsland Vocab - QS Group	37	115.303	6.478	119.427	6.160	4.124	<0.001*	0.652
Gippsland Comprehension - QS Group	37	119.451	7.928	124.627	7.332	5.176	<0.001*	0.678
Horsham Vocab - QS Group	36	118.408	5.253	121.742	6.400	3.334	0.013	0.569
Horsham Comprehension - QS Group	49	118.990	6.821	115.916	13.022	-3.074		no improvement
Hunter Vocab - QS Group	63	110.465	11.900	118.344	11.665	7.879	<0.001*	0.669
Hunter Comprehension - QS Group	63	111.413	13.833	123.159	10.774	11.746	<0.001*	0.947
Melbourne Vocab - QS Group	125	115.018	11.412	119.708	10.025	4.69	<0.001*	0.437
Melbourne Comprehension - QS Group	136	114.545	11.480	121.360	11.027	6.815	<0.001*	0.605
North Coast Vocab - QS Group	64	110.853	8.594	115.898	9.095	5.045	<0.001*	0.57
North Coast Comprehension - QS Group	100	115.144	8.774	121.562	7.942	6.418	<0.001*	0.767
North Tas Comprehension - QS Group	11	116.536	13.389	126.909	12.821	10.373	0.010	0.791
North West Vocab - QS Group	63	114.437	11.443	120.035	9.289	5.598	<0.001*	0.537
North West Comprehension - QS Group	64	119.528	9.031	124.987	10.324	5.459	<0.001*	0.563
Queensland Vocab - QS Group	39	112.959	6.067	126.467	7.609	13.508	<0.001*	1.963
Queensland Comprehension - QS Group	158	115.366	7.470	121.659	8.146	6.293	<0.001*	0.805
Remote Comprehension - QS Group	4	108.425	4.054	111.600	6.067	3.175	.150	0.615
Riverina Vocab - QS Group	44	112.789	7.103	120.318	9.158	7.529	<0.001*	0.919
Riverina Comprehension - QS Group	53	115.792	6.416	122.802	8.098	7.01	<0.001*	0.96
South Sydney Vocab - QS Group	8	108.587	6.573	119.250	2.761	10.663	0.001	2.115
South Sydney Comprehension - QS Group	8	115.225	4.348	123.075	5.630	7.85	0.001	1.561
Sydney Vocab - QS Group	84	113.413	9.215	119.211	9.527	5.798	<0.001*	0.619
Sydney Comprehension - QS Group	127	114.283	9.953	119.783	8.808	5.5	<0.001*	0.585
Tasmania Vocab - QS Group	24	105.758	8.079	113.092	8.506	7.334	<0.001*	0.884
Tasmania Comprehension - QS Group	24	109.279	10.512	118.129	11.517	8.85	<0.001*	0.803

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

7.2 PAT Results – by Demographic (Scale Scores) 2016

Demographic		Pre-Intervention		Post-Intervention				
	N	Mean	SD	Mean	SD	Gain	p	Effect size
All Schools Vocabulary – QS Group	652	113.193	9.638	120.544	11.042	7.351	<0.001*	0.709
All Schools Vocabulary – Comp Group	117	121.514	8.367	125.213	9.672	3.699	<0.001*	0.409
All Schools Comprehension – QS Group	896	115.116	9.761	121.328	9.885	6.212	<0.001*	0.632
All Schools Comprehension – Comp Group	208	123.306	9.899	127.056	11.246	3.75	<0.001*	0.354
Vocabulary – QS Indigenous	55	111.449	9.477	118.191	9.798	6.742	<0.001*	0.699
Comprehension – QS Indigenous	77	114.699	11.109	120.452	11.176	5.753	<0.001*	0.516
Vocabulary – QS Male	385	113.882	10.137	121.414	11.892	7.532	<0.001*	0.682
Vocabulary – Comp Male	58	121.286	8.653	124.771	11.400	3.485	0.011	0.344
Vocabulary – QS Female	267	112.200	8.793	119.290	9.569	7.09	<0.001*	0.772
Vocabulary – Comp Female	59	121.737	8.144	125.647	7.682	3.91	<0.001*	0.494
Comprehension – QS Male	515	114.958	10.142	120.899	10.549	5.941	<0.001*	0.574
Comprehension – Comp Male	98	124.094	9.614	127.564	11.152	3.47	0.001	0.333
Comprehension – QS Female	381	115.330	9.230	121.907	8.890	6.577	<0.001*	0.726
Comprehension – Comp Female	110	122.604	10.138	126.604	11.361	4.0	<0.001*	0.372

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

7.3 PAT Results – by State (Scale Scores) 2016

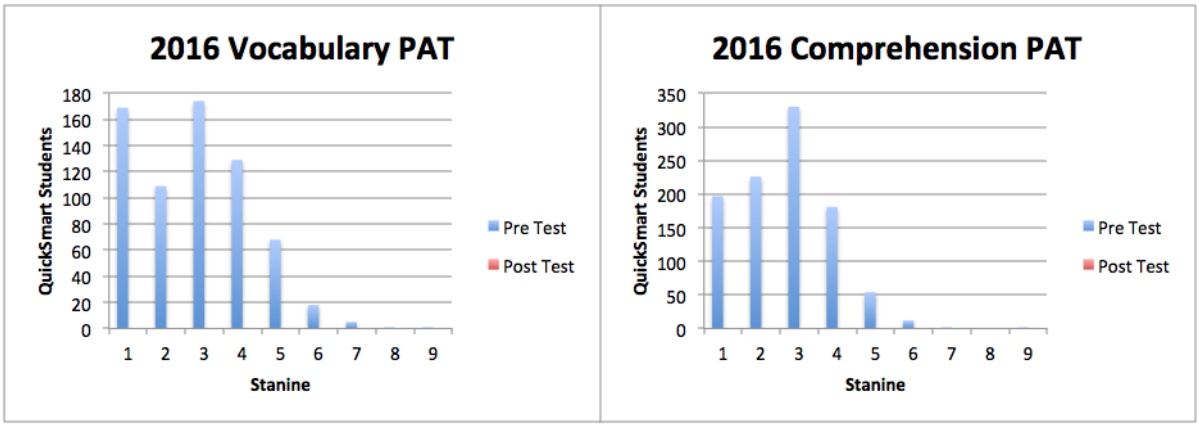
Demographic		Pre-Intervention		Post-Intervention				
	N	Mean	SD	Mean	SD	Gain	p	Effect size
NSW Vocabulary – QS Group	326	112.336	9.912	118.703	9.759	6.367	<0.001*	0.647
NSW Vocabulary – Comp Group	51	121.388	7.145	126.488	11.568	5.1	<0.001*	0.53
NSW Comprehension – QS Group	415	115.075	10.024	121.976	9.182	6.901	<0.001*	0.718
NSW Comprehension – Comp Group	76	124.947	10.164	128.362	11.842	3.414	0.004	0.309
Qld Vocabulary – QS Group	39	112.959	6.067	126.467	7.609	13.508	<0.001*	1.963
Qld Vocabulary – Comp Group	8	124.700	9.427	121.438	7.795	-3.263		no improvement
Qld Comprehension – QS Group	158	115.366	7.470	121.659	8.146	6.293	<0.001*	0.805
Qld Comprehension – Comp Group	43	122.619	8.046	128.556	7.125	5.937	<0.001*	0.781
SA Vocabulary – QS Group	15	115.067	6.713	118.560	6.059	3.493	0.077	0.546
SA Vocabulary – Comp Group	6	127.100	14.967	127.067	9.872	-0.033		no improvement
SA Comprehension – QS Group	39	111.195	9.432	117.459	12.743	6.264	0.006	0.559
SA Comprehension – Comp Group	25	115.980	8.098	117.444	13.075	1.464	0.618	0.135
Tas Vocabulary – QS Group	24	105.758	8.079	113.092	8.506	7.334	<0.001*	0.884
Tas Vocabulary – Comp Group	6	111.983	8.582	118.400	3.275	6.417	0.057	0.988
Tas Comprehension – QS Group	35	111.560	11.796	120.889	12.457	9.329	<0.001*	0.769
Tas Comprehension – Comp Group	6	124.167	6.230	130.533	10.602	6.367	0.035	0.732
Vic Vocabulary – QS Group	248	114.963	9.568	122.875	12.538	7.912	<0.001*	0.709
Vic Vocabulary – Comp Group	46	121.613	7.663	125.102	7.744	3.489	<0.001*	0.453
Vic Comprehension – QS Group	249	116.141	10.138	120.706	10.963	4.565	<0.001*	0.432
Vic Comprehension – Comp Group	58	124.733	10.563	128.017	10.432	3.284	0.005	0.313

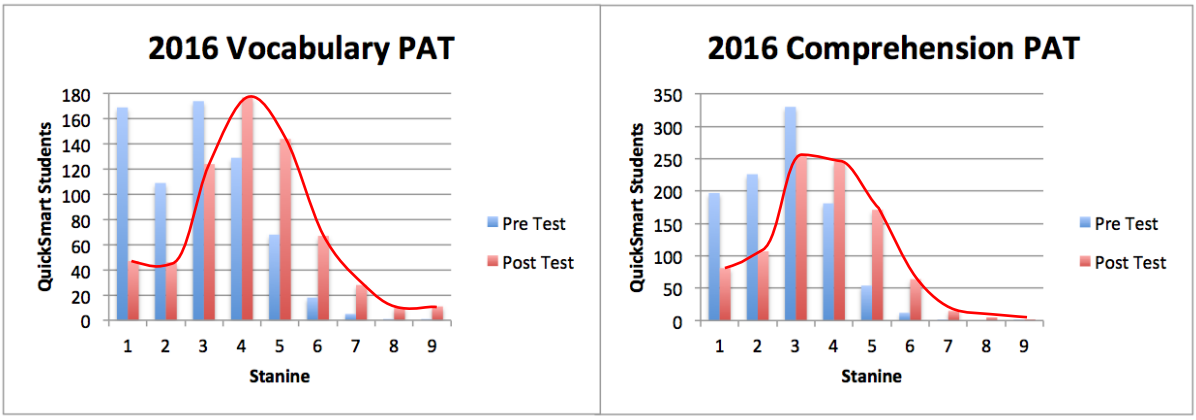
Note: only students who did both 'pre' and 'post' test are included in the table.

7.4 PAT Results – by Grade (Scale Scores) 2016

Grade		Pre-Intervention		Post-Intervention				
	N	Mean	SD	Mean	SD	Gain	p	Effect size
Grade 3 Comprehension – QS Group	6	95.117	17.170	107.017	13.646	11.9	0.001	0.767
Grade 3 Comprehension – Comp Group	3	112.133	16.570	122.200	15.329	10.067	0.243	0.631
Grade 4 Vocabulary – QS Group	51	101.276	8.601	108.378	8.317	7.102	<0.001*	0.839
Grade 4 Vocabulary – Comp Group	14	111.379	7.259	119.021	4.917	7.642	0.012	1.233
Grade 4 Comprehension – QS Group	58	104.291	8.083	113.578	8.041	9.287	<0.001*	1.152
Grade 4 Comprehension – Comp Group	19	113.963	10.166	120.568	9.168	6.605	<0.001*	0.682
Grade 5 Vocabulary – QS Group	60	107.130	9.256	114.437	8.242	7.307	<0.001*	0.834
Grade 5 Vocabulary – Comp Group	16	117.725	4.933	122.888	5.266	5.163	<0.001*	1.012
Grade 5 Comprehension – QS Group	117	110.397	10.440	118.912	8.369	8.515	<0.001*	0.9
Grade 5 Comprehension – Comp Group	34	120.126	8.780	127.088	11.759	6.962	<0.001*	0.671
Grade 6 Vocabulary – QS Group	45	112.662	9.470	118.242	8.335	5.58	<0.001*	0.626
Grade 6 Vocabulary – Comp Group	15	121.253	6.391	128.567	12.456	7.314	0.027	0.739
Grade 6 Comprehension – QS Group	64	113.002	8.013	119.595	11.906	6.593	<0.001*	0.65
Grade 6 Comprehension – Comp Group	20	124.725	10.720	129.625	11.592	4.9	0.025	0.439
Grade 7 Vocabulary – QS Group	309	114.691	7.435	122.397	10.324	7.706	<0.001*	0.857
Grade 7 Vocabulary – Comp Group	52	123.887	8.624	124.925	10.984	1.038	0.521	0.105
Grade 7 Comprehension – QS Group	421	116.748	8.067	123.149	8.649	6.401	<0.001*	0.765
Grade 7 Comprehension – Comp Group	85	126.202	8.048	126.949	12.057	0.747	0.415	0.073
Grade 8 Vocabulary – QS Group	182	116.062	10.149	123.284	11.268	7.222	<0.001*	0.673
Grade 8 Vocabulary – Comp Group	20	125.665	4.583	129.640	5.658	3.975	0.023	0.772
Grade 8 Comprehension – QS Group	206	118.304	9.450	122.067	10.141	3.763	<0.001*	0.384
Grade 8 Comprehension – Comp Group	38	124.732	10.825	128.518	9.387	3.786	0.001	0.374
Grade 9 Vocabulary – QS Group	4	118.250	9.087	129.150	4.664	10.9	0.157	1.509
Grade 9 Comprehension – QS Group	18	121.450	5.854	125.500	14.260	4.05	0.066	0.372
Grade 9 Comprehension – Comp Group	9	122.233	4.364	131.378	6.690	9.145	0.000	1.619
Grade 10 Comprehension – QS Group	5	110.280	15.988	111.980	20.313	1.7	0.639	0.093

7.5 National Literacy PAT Improvement of QuickSmart Students for 2016





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.

8 APPENDIX B: *QuickSmart* Sessions

8.1 Attendance Summary

QS Students	N (students)	N (schools)	Mean Sessions Offered	Mean Sessions Attended	% Mean Attended	Weeks completed	% Program completed
All QS	1037	60	63.23	49.37	78.114	16.457	54.856
Male	578	58	63.230	49.020	77.602	16.340	54.467
Female	459	57	63.230	49.830	78.758	16.610	55.367
Indigenous	93	12	58.52	42.81	71.346	14.270	47.567
Grade 3	12	2	72.330	62.080	86.383	20.693	68.978
Grade 4	49	10	74.670	60.550	80.467	20.183	67.278
Grade 5	104	17	68.150	56.930	84.062	18.977	63.256
Grade 6	75	19	69.520	57.370	83.313	19.123	63.744
Grade 7	495	34	64.050	49.880	78.168	16.627	55.422
Grade 8	264	28	56.440	41.740	73.802	13.913	46.378
Grade 9	29	8	54.450	39.790	77.425	13.263	44.211
Grade 10	4	3	61.250	38.750	56.963	12.917	43.056
Grade 11	5	1	61.200	49.000	76.657	16.333	54.444

Note: only students and schools for whom attendance data were provided are included in the table (about 76% of students).
Note: 'Weeks completed' is based on the assumption that the school did three *QuickSmart* sessions a week
Note: '% Program completed' is calculated relative to the full *QuickSmart* program of 30 weeks.
Note: Other grades were excluded from the analyses as they had fewer than 5 QuickSmart students with attendance.