Progress monitoring of dyslexic primary school learners enrolled in an English Exam Skills Programme

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1.   Dyslexia Association of Singapore

Abstract

An English Exam Skills Programme (EESP) was designed and implemented in 2013 with the primary goal of helping primary school students with dyslexia achieve in their school and national examinations, as well as become proficient users of the English language in the long run. The programme was designed to cater to the English examination needs of learners with dyslexia in language and literacy components such as grammar, spelling rules, sentence synthesis and comprehension skills. Previous studies (Leong, 2015; Leong, Asjamiah and Wang, 2017; Razak, See, Tan and Leong, 2018) have demonstrated that the programme is effective in addressing the examination needs of this group of learners through an explicit and systematic teaching methodology. However, a significant limitation in earlier research conducted on the EESP, which was the duration of each study, called for further investigation into the retention of concepts taught in the programme and its impact on students' performance and progress over time. To address this limitation, the performance of 96 primary school students, between Primary 5 to 6, who enrolled in the programme at different stages was examined using a two-way ANOVA. Progress of students who have been in the programme for 10 weeks was compared with students who have been in the programme for 20 weeks and 30 weeks. Findings of this study suggest that a full impact of support for learners with dyslexia demands longer exposure to skills and concepts in order to consolidate their learning. The results also confirm that students achieved better scores on their termly review tests when they are enrolled in the EESP over a period of 30 weeks.

Keywords: progress monitoring, assessment, literacy and language intervention, effective instruction, self-regulated learning

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INTRODUCTION

English Language is one of the compulsory subjects taken by primary school students in Singapore. As English is used as the 'lingua franca of the Internet, of science and technology and of the world' , proficiency and the ability to communicate effectively in English becomes a necessity in order to equip students with the ability to survive and thrive in 'an increasingly competitive international environment' (Ministry of Education [MOE], n.d., p. 6). As such, it is greatly emphasised in the education system and is assessed in all high stakes national examinations, including the Primary School Leaving Examination (PSLE) sat by all Primary 6 students attending mainstream schools, including students diagnosed with dyslexia, prior to advancing to the next level of their educational journey (Loh and Shih, 2016).

The Ministry of Education (MOE), in its November 2018 publication, 'Professional Practice Guidelines for the Psycho-educational Assessment and Placement of Students with Special Educational Needs', defines dyslexia as '...a type of specific learning difficulty identifiable as a neurodevelopmental disorder' that primarily affects the skills involved in accurate and fluent reading and spelling. Characteristic features of dyslexia are difficulties in phonological awareness, verbal memory and processing speed. Other co-occurring difficulties '...may be seen in aspects of language' (MOE, pp. 35-39) such as reading comprehension (IDA, 2002).

Mainstream primary school students diagnosed with dyslexia attend literacy remediation classes at the Dyslexia Association of Singapore (DAS) where they are supported in areas such as reading, spelling, writing, reading comprehension and oracy using the Orton-Gillingham instructional approach that emphasises the teaching of language concepts in a direct and explicit manner and engages students' visual, auditory, kinesthetic and tactile learning modalities simultaneously.   However, improvements in reading and spelling skills made by students are observed to be incongruent with scores obtained in their school English exams. Tunmer and Greaney (2008) highlighted the ímbalance between students' '...learning of new skills and actually using them' (p. 248). There exist concerns over the transferability of skills learnt in reading or spelling in dealing with other areas of language such as Reading Comprehension.

The PSLE English assesses students' proficiency in the use of the English language across a broad range of topics and skills that subsume speaking, listening, writing, grammar, vocabulary and reading comprehension skills. Questions consisted of Multiple Choice Questions (MCQ) and Open-Ended Questions (OEQ). The OEQs are in the Cloze Passage, Synthesis and Transformation and Reading Comprehension components with a total marking weightage of about 70%. These components are found in Paper 2 of the PSLE English Examinations. These are the areas in which students with dyslexia are found to be demonstrating specific challenges.

The English Exam Skills Programme (EESP) was established at the DAS in 2013 to address these exam-based challenges that students with dyslexia face. Beyond that, the programme also aims to help learners become more proficient in areas other than examinations such as oral communication and written expression. These are skills useful for students in the long run to become confident users of the English language. In the process, the programme also hopes that students will enjoy learning the language through our fun and unique teaching strategies. This programme supplements the existing literacy remediation support students are currently receiving under the Main Literacy Programme (MLP). Students receive intensive support in four components - Grammar (GR), Editing (ED), Synthesis and Transformation (ST) and Reading Comprehension (CP). Concepts and skills are taught progressively and cumulatively, following the OG principles and adhering as closely as possible to the format and expectations of the school and PSLE English examinations. Students embark on the programme at Primary Three and continue to receive support until Primary Six when they sit for the PSLE. Classes are held weekly for a duration of one hour per week. Students would complete ten hourly lessons in a term, with each term consisting of 10 weeks.

As students begin enrolling in the programme at Primary Three and continue to be in the programme till Primary Six, there is a need to investigate and track the progress of students in terms of their ability to retain and apply concepts learnt over a longer period of time in the form of a longitudinal study. A single and elaborate Pre- and Post- test that encompasses the concepts and skills taught throughout a 2-year curriculum cycle has been designed. With effect from 2017, students sat for the written Pre-test upon entering the programme and the Post-Test upon leaving the programme right before their PSLE. An analysis of the Pre- and Post- results of the Entry/Exit test shall address the questions below. Student performance in each of the components of the EESP and their implications will also be examined and discussed.

1. What are the areas in which students' progress is measured?
2. How are students' progress measured? What are the criteria / indicators?
3. How did students perform in each component and what are the implications?

LITERATURE REVIEW

How dyslexia affects literacy and language learning and development

Difficulties with phonological processing, rapid naming, working memory and processing speed that characterise dyslexia impact the learning and development of literacy and language related skills (BDA, 2007; Nicolson and Fawcett, 2007; Crisp, Johnson and Novakovic, 2012). Challenges in reading, vocabulary and spelling encountered by learners with dyslexia as a result of these difficulties affect their ability to navigate

through long sections of text and track sequence of events or ideas. Effortful and laborious reading often contributes to frustration, reduced reading experience and motivation rather than meaningful text comprehension. A study by Snowling, Duff, Nash and Hulme (2016) that compared the language abilities of children at familial risk of dyslexia and those with none between the ages of 3 and 8, also demonstrated vastly divergent skills in receptive grammar and expressive vocabulary.

Children with dyslexia have been known to display language difficulties beyond phonological processing (Rispens and Been 2007; Shankweiler et al., 1995). In a study by McArthur, Hogben, Edwards, Heath and Mengler (2000), approximately half of a sample of children with dyslexia met the criteria for specific language impairment (SLI), which is defined as a difficulty in acquiring spoken language despite otherwise normal intellectual functioning, hearing and adequate learning environment (Leonard, 1998). Considering that learning grammar and acquiring the broader aspects of language skills require the activation of similar cognitive functions such as working memory and processing speed, it can be deduced that children with dyslexia would also experience difficulties beyond phonological aspects of language (Wijnen, 2015).

Challenges in learning faced by students with dyslexia can be further attributed to procedural learning difficulties explained by the neural-systems approach of the cerebellar functions involved in language-related skills (Fawcett and Nicolson, 2007). Since procedural learning is based on picking up skills and habits with practice so that they can be performed with little conscious effort, impaired functions in the language-based procedural learning system result in children with dyslexia having difficulties acquiring automaticity. This is further supported by the automatization deficit hypothesis (Nicolson and Fawcett, 1990), where the learning of skills by dyslexics is not automatic and fluent.

Despite these challenges, Fawcett and Nicolson (2007) suggested that children with dyslexia can still achieve at normal levels by 'consciously compensating' for their lack of automaticity. Hence, appropriate intervention for dyslexia need not be driven solely by the widely known causes of phonological deficits, but also the appropriate teaching of procedural skills (Nicolson, Fawcett, Brookes and Needle, 2010). Owing to the working memory difficulties experienced by learners with dyslexia, research investigating effective instruction suggests the importance of repetitive learning and repeated exposure to facilitate retention and enhanced automaticity leading to autonomous practice. As learning procedural skills involve learners acquiring skills in stages, gradually building on their prior knowledge, this suggests that learners with dyslexia would benefit from instruction and the teaching of skills to tackle English Examination questions that align with the OG principles of being highly structured, sequential and cumulative.

Features of English Exam that affect students with dyslexia

Peer and Reid (2002) contended that traditional methods of assessing academic abilities place students with dyslexia in a disadvantaged position as the primary mode of assessment is still centred on written tasks. During an examination, students with dyslexia may face difficulties in processing information because of challenges in reading, spelling and writing, and may also experience greater stress as a result of being in a timed assessment setting (Riddick et al., 1999). Similarly, Osborne (1999), concluded that students with dyslexia scored worse in written examinations than their peers without dyslexia. Attending mainstream schools entails these students being subjected to the rigours of school and high stakes examinations despite being given access accommodations such as additional time, single-sided papers and exemption from Mother Tongue teaching and assessment. It is thus imperative that support in tackling some of the most challenging components of the English Examination is provided to help them manage and alleviate some of the anxieties associated with the demands and conditions of examinations. The EESP has thus been established with these objectives in mind.

A previous study by Leong (2015) revealed that students who had attended the EESP made consistent progress and significant improvements, particularly in the Editing and Synthesis and Transformation components of the programme, when results from students' Pre- and Post- tests conducted on a termly basis were compared and analysed. A subsequent study by Leong, Asjamiah and Wang (2017) that compared the performance of students enrolled in the programme and those who did not, over a period of 20 weeks, examined the classroom practices and teachers' teaching style that could have contributed to students' improvement, particularly in components such as Synthesis and Transformation and Reading Comprehension components. These studies, however, measured progress within a short duration of 10 to 20 weeks (1-2 terms) and did not fully investigate the effects of direct, explicit, sequential and cumulative teaching of skills and strategies over the extended period throughout which the students are enrolled in the programme.   As students typically begin enrolling in the programme at Primary Three or Four and continue to receive support until they eventually sit for the PSLE, its impact in the long term on students' progress and performance in English examination should be investigated.

Long Term Progress Monitoring

It is important that we establish how progress is defined before it can be measured and monitored, more so if support is being provided over a long duration of more than 20 weeks. Guided by the premise that it is an indication of an occurrence of learning, we would then seek to observe a demonstration of learning in terms of Sadler's three conditions - that students '..must be able to do, on demand, something they could not do

before, be able to do it independently of particular others, those others being primarily the teacher and members of a learning group (if any) and they must be able to do it well.'   A student is therefore, said to have made progress when he or she is observed to have satisfied these conditions and is capable of '..mixing routinised knowledge, ...with a modicum of tentative or experimental knowledge, so as to 'do' previously unseen tasks' (Sadler, 2007, pp. 390-391). As students with dyslexia require more effort to be able to organise and internalise language concepts, they would certainly benefit from being given more time to apply and practice newly learned skills, possibly across different contexts, to promote long term retention and consolidation of learning (Becker and Domitrovich, 2011). As such, closely monitoring the process of students attaining progress in the EESP could be best facilitated by the provision of a longer duration of progress monitoring. This would allow teachers to have opportunities to evaluate instructional effectiveness throughout the period and have the flexibility to implement additional, alternative and more effective forms of instruction in the event that students do not demonstrate adequate progress in the course of examining rates of change in assessment outcomes (Cortiella, 2007; Fuchs and Fuchs, 2004; Quenemoen, Thurlow, Moen, Thompson and Morse, 2004).

Safer and Fleischman (2005) described the goal of student progress monitoring as an avenue to provide teachers with sufficient information to constantly evaluate the strengths and weaknesses of their teaching and to make adjustments in improving instructions. This goal can be reached by measuring if students are learning at a pace that matches their learning needs and abilities. Should students' rate of improvement fall below their supposed growth rate, teachers are able to modify their teaching material, and identify specific skills or components to reteach and intensify practice opportunities. Stecker et. al. (2008) further emphasized the importance of progress monitoring as an essential tool for any educational system. Gaining access to progress monitoring data empowers teachers to guide students to achieve high levels of performance as they adjust their instructional decision-making in response to student data. Becker and Domitrovich (2011) also suggest that the quality and impact of an intervention programme can be enhanced if progress is monitored when the intervention is in progress, rather than when it is completed. If intervention is viewed as a dynamic process requiring on-going refinement to meet the changing needs of the child, it ensures that students will have opportunities to adapt to intervention, thereby facilitating more effective bridging of conceptual gaps (Parkinson and Humphrey, 2008).

Progress of students over a long-term intervention in English literacy instruction

In a study by Droop, Elsäcker, Voeten and Verhoeven (2016) that explored the long-term effects of strategic reading instruction (SRI) on elementary students over a period of two years, it was found that after two years of intervention, the students in the intervention group exhibited greater growth with respect to knowledge of reading strategies than the control group. The effect size was substantial; compared with an average student of the

control group, the average student in the experimental condition improved by 21 percentile points at the end of the first year of intervention and by 25 percentile points at the end of the second year of intervention. With respect to reading comprehension skills, at the end of the second year of intervention, significant positive effects were evidenced on the general reading comprehension tests. The effect sizes were small, but consistent with other studies (Souvignier and Mokhlesgerami, 2006; Sporer et al., 2009). The improvement index in reading comprehension was about 8 percentile points at the end of the second year of intervention, while hardly any improvement was evidenced at the end of the first year of intervention.

The findings of this study corroborate earlier studies of Davis (2010), Rosenshine and Meister (1994), and Souvignier and Mokhlesgerami (2006) and fit the models of self-regulated learning, which stress that the modeling of strategies by the teacher lead to the internalization of these strategies by students who then apply the strategies when reading texts independently. As such, the modeling of strategies and the students' practice of applying these strategies during independent reading may be effective key components in the reading programme. It is also highly probable that the focus on teacher modeling and on the verbalization of strategy used provided students the opportunity to build declarative knowledge regarding the reading strategies in the first year of intervention and that the continued modeling by the teachers and the students in the second year of intervention helped the students to internalize the procedural use of the strategies when independently reading texts. The recent study by Leong, Asjamiah and Wang (2017) investigating teachers' classroom practices on a group of students with dyslexia undergoing Reading Comprehension support in the EESP observed students recalling and applying the 'thought processes modelled by their teacher' in the reading process such that they eventually became 'more self-initiated to look for contextual clues'. The teachers' repetitive and consistent use of instructions such as numbering paragraphs and words such as 'highlight' and 'keywords', established a form of routine for students to follow which guided them in their approach to questions and locating accurate sections of text referred to in questions with greater automaticity and less hesitation (p.191).

Factors of intervention that influence sustainable and long-term progress

Becker and Domitrovich (2011) also suggested the importance of consistency in shared language and skills among teachers in contributing to long term students' progress and sustainability of positive benefits of interventions. It helps to reduce variability in implementation whereby coordinated support systems are made available to ensure that all teachers receive appropriate training and feedback on performance. Teachers who had undergone prior training and had practical teaching experience in a pedagogical approach play an important role in developing professional competence and a common value system of best teaching practices that could help foster an effective language teaching environment and learning experience for students (Leong et al, 2017).

An example of this is illustrated in the study by Leong et al.,(2017) on classroom practices in the EESP that contributed to progress made by students with dyslexia. The consistent use of the RIMAIR lesson structure - Review previous concepts; Introduce new concept(s); Model application of skills; Apply with guidance; Independent application; Recap concept(s) learnt lesson structure and VAKT (Visual; Auditory; Tactile; Kinesthetic) elements, by the teacher supports student engagement and promotes better retention, thereby enhancing students' learning processes.

Research aims

This research therefore aims to evaluate and compare the progress made by students with dyslexia who are enrolled in the English Exam Skills Programme over a period of 10, 20 and 30 weeks. An earlier study by Leong, Asjamiah and Wang (2017) indicated positive outcomes by students at the end of a 20-week enrolment in the programme where students were found to have benefitted from the underlying teaching processes and procedures that teachers abided by and the classroom incidences that promoted students' learning, understanding and meaningful application of concepts. The impact of these unique teaching and classroom practices on students' retention of concepts and performance over an extended period of time covering thirty weeks will be examined.

METHODS

A.   Participants

A total of 96 students made up of Primary 5 (P5) and 6 (P6) students in the Standard stream participated in this study. These are students attending mainstream schools who were diagnosed with dyslexia and attending the Main Literacy Programme (MLP) at the Dyslexia Association of Singapore for literacy intervention. They had enrolled in the EESP with the aim of improving the English subject in their school English Examinations and concerns over their readiness for the PSLE.

Table 1. Total number of students (Standard)

	TERM 4 (the previous year) + TERM 1	TERM 2	TERM 3
TOTAL STUDENTS	80	88	96
STUDENTS ENROLLED	0	8	8

In Term 1, there were a total of 80 participants consisting of students in primary 5 and 6 of the standard steam. All 80 students sat for the written entry test by the end of week 1, term 1.   In Term 2, an additional eight new students joined the programme and sat for the written entry test by the end of week 1, term 2. Similarly, eight more new students joined the programme in term 3 and took the written entry test by week 1, term 3, bringing the total number of students to 96 at the end of Term 3. All 96 students then took the written exit test at the end of week 10, term 3.

B.   Research Design and Instrument

This research takes on a longitudinal design where the performance of students in the Pre- and Post- tests administered over a period of 10, 20 and 30 weeks was examined and evaluated.

A Written Entry Test has been designed by the curriculum developers of the EESP to align as closely as possible with the format and structure of the mainstream school English Exam and PSLE, despite just covering the Synthesis and Transformation (ST), Editing (ED) and Reading Comprehension (RC) components.   Amongst the series of guidelines proposed by Stecker et. al. (2008) for teachers to implement effective and meaningful progress monitoring, students' performance should be evaluated based on measures that are reliable, valid and sensitive to any improvements or lack of progress made by them. To ensure that the Written Entry Tests designed by curriculum developers in the EESP were reliable and valid, they were subjected to a validation process adhering to McNamara's (2000) "testing cycle" of the design stage, the construction stage, the try-out stage, and the operational stage (Leong, 2019). Results obtained that included both item and whole test analyses indicated substantial correlations between test takers' performances on the test designed by EESP curriculum developers and their performances on a test conducted in mainstream primary schools. Hence it can be established that the Written Entry Test's construct validity could possibly predict EESP students' performance on their school and national examinations and hence, gauge the effectiveness of its curriculum in supporting students with dyslexia in the primary schools' English examinations.

The first batch of 80 P5 and P6 Standard students sat for a Written Entry Test before the start of their first lesson at P5. It tested their knowledge, understanding and application of concepts and skills in three components - Synthesis and Transformation (S&T), Editing and Comprehension. Each of the components covered a range of topics, concepts and skills that are taught within a two-year cycle. There were 10 open-ended questions each in the S&T and Editing components and 8 open-ended questions in the Comprehension component. The first batch of 80 students sat for the Written Entry Test before the start of their first out of 10 lessons in Term 1. In Term 2, another batch of 8 new students sat for the Written Entry Test before their first out of 10 lessons in Term 2. In Term 3, another batch of 8 new students sat for the Written Entry Test before the start of their first out of

10 lessons in Term 3. At the end of Term 3, before the P6 students sat for their PSLE, all 96 students sat for the Written Exit Test after their 10th lesson in Term 3. The figure 1 below illustrates the process of progress monitoring for these students:

Instruction

Students who enrolled in the programme attended one hour of instruction per week for a total of 10 weeks in a term covering three components - Editing (ED), Synthesis and Transformation (ST) and Comprehension (CP). In each term, up to two hours of lesson time is allocated for ED while ST and CP components are allocated 4 hours each. For the ED component, students are given opportunities to apply and directly transfer phonogram concepts, as well as spelling and suffixing rules taught in exam-type questions. In the case of ST and CP components, lessons focus on the learning of a specific topic, as well as application of a specific strategy or skill related to the topic, in questions that are formatted to align closely with that of school exams and PSLE.
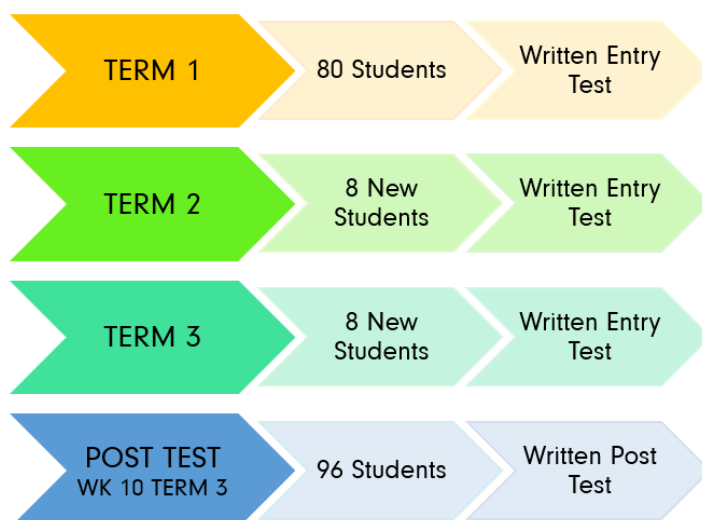
TERM 1	80 Students	Written Entry Test
TERM 2	8 New Students	Written Entry Test
TERM 3	8 New Students	Written Entry Test
POST TEST WK 10 TERM 3	96 Students	Written Post Test

Figure 1. Progress monitoring system

Each lesson follows the R-I-M-A-I-R structure (see table 2 below) to denote the following lesson delivery processes that take place in a typical, hour-long EESP class:

Table 2. R-I-M-A-I-R structure

R	**R**eview of previously taught concepts
I	**I**ntroduction of new topic / concept / skill / strategy
M	**M**odelling of how concept / strategy is applied in questions
A	**A**pplication of concept / strategy by students with teachers' guidance
I	**I**ndependent application of concept / strategy by students
R	**R**ecap of the topic / concept / skill / strategy taught

Data Collection Procedures

The completed Written Entry Test and Written Exit Test scores of the three groups of students who have been in the programme for 10, 20 and 30 weeks were individually marked and their scores were tabulated and analysed at the end of Term 3. Quantitative data in the form of ANOVA test results and effect sizes of these students were recorded. Qualitative data from the Written Entry Test and Written Exit Test were also collected by analyzing the errors of each student's script, and comparing the differences between each student's pretest and posttest scripts. Their scores for each component and the types of errors made in each component were also analysed to observe demonstration of ability to apply specific skills and strategies that have been taught in the programme as each component of the written test had a specific scoring criteria. The topics and concepts taught and assessed per component will be explained in Table 3.

In the Synthesis and Transformation component, students were required to transform sentences from one form to another. For example, if a direct speech is presented as a question, students will need to know how to transform the sentence to its indirect speech form. Any form of spelling or grammatical mistake within each question would cause students to lose marks for the entire component. They were required to synthesize and transform sentences that adhere to specific ow certain grammatical patterns.

Example: **Direct/Indirect Speech**

2. "We have been studying for our exams since last month," said Julie.

Julie said that they had been studying for their exams since the previous month.

☐ 2 pronoun changes (they, their)
☐ Verb tense (had been studying)
☐ Time reference (the previous month)

Table 3. Concepts and skills assessed: Synthesis and Transformation (ST)

TOPIC	CONCEPT
Spoken Questions	◆ Verb tenses ◆ Pronoun change ◆ Question word (if) ◆ Time Reference
Direct and Indirect Speech	◆ Verb Tenses ◆ Pronoun change ◆ Time Reference
Passive and Active Voice	◆ Verb Tenses ◆ Word Order ◆ 'by'
Contrast Words (Although, Despite)	◆ Verb Change ◆ Order of clause ◆ Punctuation (comma)
Much to...	◆ Word Class Change ◆ Comma
Conditionals (If, Unless)	◆ Position of conditional clause ◆ Negation
Whose	◆ Position of Subject ◆ Noun belonging to subject after 'whose'
Neither...nor	◆ Two negative alternatives after 'Neither' and 'Nor' ◆ SVA

In the above sample question, where students are required to transform the direct speech into indirect speech, a total of 3 marks will be awarded for accurate changes administered to pronouns, verb tense and time reference. Each mark is independent of each other so a student will be awarded a mark for each correct change made in his or her written response to the question.

In the comprehension component, students were expected to demonstrate both literal and inferential comprehension ability by answering questions that target the application of specific skills and strategies taught both in the process of reading and responding to questions after reading a text passage. Amongst the skills taught were pronoun and noun-pronoun referencing that helped students establish links between parts of text and the identification of 'Right There' and 'Think and Search' question types that targeted question processing skills. One mark was awarded for each accurate response given.

Table 4. Concepts and skills assessed: Comprehension (CP)

CONCEPTS	SKILLS
Referencing	♦ Personal Pronouns ♦ Demonstrative Pronouns ♦ Non-pronoun References
Signal Words	♦ Contrast words (however, although) ♦ Cause and Effect (Hence, Therefore)
Vocab -Context Questions	♦ Matching words with similar meaning
Question Analysis	♦ Right There questions ♦ Think and Search questions
True/False Questions	♦ Identify keywords in statement ♦ Matching keywords with those in passage ♦ Identify relevant evidence

Example

Topic: Question Analysis

6. Read the question below. (2m)

> Which word in paragraph 2 shows that Della was very proud of her hair?

a. Is the question a 'right there' or a 'think and search' question? Tick the correct answer.

(√) Right there
( ) Think and search (1m)

Table 5. Concepts and skills assessed: Editing (ED)

TOPICS	SYLLABLE TYPES	SPELLING RULES	SUFFIXING RULES
CONCEPTS	Open/Closed Magic-e	c/k/-ck/ch/-que ch/-tch Soft 'c' (ce, ci, cy, s) Soft g (j, -dge. ge)	Doubling Rule Drop-e Rule Y to i Rule

Table 5 describes the range of spelling rules and patterns that students were taught during the period of intervention. During Editing lessons, students would be exposed to words that are mistakenly spelled and have flouted spelling rules. They were also taught how to identify the rules that the wrongly spelled words have violated, and make necessary changes to correct the spelling of the words. In the two examples below, students were required to apply their knowledge of the soft-g sound - /j/ to correct the misspelled word.

Example

large | -dge, j, soft g
The peregrine is not a **lardge** bird. The male is only 35 - 45cm long and

The peregrine is not very fussy about its nest. It usually just makes a

ledge | -dge, j, soft g
scrape in the earth on a cliff **lej**. Sometimes, it takes an old nest left behind by

The editing component taps onto their knowledge of these spelling rules and requires students to apply them to tackle misspelled words. Students were awarded 1 mark for a correctly edited word.

RESULTS

Data was tabulated and a series of statistical analyses undertaken, including both t tests and a 2-factor Anova.

The first t-test conducted was a paired samples t-test comparing the pre-test and post-test scores of students in the Standard stream in general. Results show that there is a significant difference between pre- and post-test scores for Standard students. Cohen's effect size value (d = 0.77) suggests a medium effect size confirming the progress of all the 96 students in the Standard stream. A high p value (<.001) suggests a significant difference in the performance of the students in the Post-test. (Cohen suggested that d=0.2 be considered a 'small' effect size, 0.5 represents a 'medium' effect size and 0.8 a 'large' effect size.)

A 2-factor Analysis of Variance (Anova) was undertaken with 2 levels, one between (group) and one within, (pre/post). The results indicated a main effect of time (df,1,2, F=35.749, p=<.000). and also of group (df1,2, F=320.105, p=<.000).

Table 6.1 Results of Paired Samples t-test comparing pre-test and post-test scores of students in the Standard Stream

	n	Mean	SD	df	p
PRE-TEST	96	26.32	9.97	95	<.001***
POST-TEST	96	34.00	9.87		

*p < .05, **p<.01, ***p<.001

To evaluate the impact of the programme by enrolment term, a 3-paired sample t-test comparing the scores of students who enrolled at 3 different stages was conducted.

Table 6.2 Results of Paired Samples t-test comparing pre-test and post-test scores of students in the Standard Stream enrolled in Term 4 (2016) and Term 1 (2017)

	n	Mean	SD	df	p
PRE-TEST	80	26.85	10.28	79	<.001***
POST-TEST	80	34.86	10.06		

*p < .05, **p<.01, ***p<.001

Table 6.2 shows the results of the paired samples t-test comparing the pre-test and post-test scores of students in the Standard stream who enrolled in Term 4 in 2016 and Term 1 in 2017. Results show that there is a significant difference between pre and post-test scores for these students. Cohen's effect size value (d = 0.79) suggests a borderline large effect size suggesting progress of students who enrolled in Term 4 and Term 1.

Table 6.3 Results of Paired Samples t-test comparing pre-test and post-test scores of students in the Standard Stream enrolled in Term 2

	n	Mean	SD	df	p
PRE-TEST	8	24.75	9.66	7	0.03*
POST-TEST	8	32.63	9.36		

*p < .05

Table 6.3 shows the results of the paired samples t-test comparing the pre-test and post-test scores of students in the Standard stream who enrolled in Term 2 in 2017. Results show that there is a significant difference between pre and post-test scores for these students. Cohen's effect size value (d = 0.83) suggests a large effect size confirming the progress of students who enrolled in Term 2.

Table 6.4. Results of Paired Samples t-test comparing pre-test and post-test scores of students in the Standard Stream enrolled in Term 3

	n	Mean	SD	df	p
PRE-TEST	8	23.38	6.35	7	0.02*
POST-TEST	8	28.50	8.40		

*p < .05

Table 6.4 shows the results of the paired samples t-test comparing the pre-test and post-test scores of students in the Standard stream who enrolled in Term 3 in 2017. Results show that there is a significant difference between pre and post-test scores for these students. Cohen's effect size value (d = 0.69) suggests a medium effect size indicating progress made by students who enrolled in Term 3.

Tables 6.5 to 6.8 show the scores for individual components converted into percentage scores.

Table 6.5. Individual component progress of students in Standard Stream (96 students)

	Pretest % score	Posttest % score	Difference	P-value	Effect size
Synthesis & Transformation (ST)	51.96	66.75	+14.78	<0.01**	0.71
Editing (ED)	65.94	76.25	+10.31	<0.01**	0.45
Comprehension (CP)	34.55	50.12	+15.57	<0.01**	0.70

*p < .05, **p<.01, ***p<.001

Table 6.5 shows that the post-test scores of all three components were better compared to the pre-test scores. The difference for all the three components was significant and had a medium effect size, suggesting progress attained by students in all the components.

Although students overall are seen to have made most progress in the Comprehension component as shown in Table 6.5, students' progress on individual components based on their term of enrolment into the programme was different. Tables 6.6 to 6.8 analyses students' progress on individual components based on their term of enrolment into the programme. In Table 6.6, students who enrolled in T1 2017 showed highest improvement in the Synthesis and Transformation component. However, in Tables 6.7 and 6.8, students who enrolled in T2 2017 and T3 2017 showed highest improvement in Comprehension.

Table 6.6 Individual component progress (T1 2017) (80 students)

	Pretest % mean score	Posttest % mean score	Difference	P-value	Effect size
Synthesis and Transformation (ST)	52.60	68.08	+15.48	<0.001***	0.97
Editing (ED)	66.88	78.13	+11.25	<0.001***	0.56
Comprehension (CP)	35.63	50.97	+15.35	<0.001***	0.83

$*p < .05, **p<.01, ***p<.001$

Table 6.7 Individual component progress (T2 2017) (8 students)

	Pretest % mean score	Posttest % mean score	Difference	P-value	Effect size
Synthesis and Transformation (ST)	48.56	61.06	+12.50	0.1304	0.61
Editing (ED)	71.25	77.50	+6.25	0.3506	0.35
Comprehension (CP)	27.78	50.00	+22.22	0.0052**	1.41

$*p < .05, **p<.01, ***p<.001$

22   T. E. A. Razak, S. A. Asmuri, A. Wang, and E. Leong

Table 6.8 Individual component progress (T3 2017) (8 students)

	Pretest % mean score	Posttest % mean score	Difference	P-value	Effect size
Synthesis and Transformation (ST)	49.04	59.13	+10.10	0.1234	0.62
Editing (ED)	51.25	56.25	+5.00	0.1705	0.54
Comprehension (CP)	30.56	41.67	+11.11	0.1894	0.51

*p < .05, **p<.01, ***p<.001

DISCUSSION

There is clear evidence here for the positive impact of the intervention on all 3 groups. However, results indicate that although improvements have been observed in the results of most students that are indicative of successful intervention, students who had been in the programme for a longer period of time (30 weeks, Term 1) produced significantly better results than the rest.

Students in Term 1 were observed to have made the most improvement, followed by those in Terms 2 and 3. The statistically significant p value (<0.001) in Table 6.5 in the results of students who underwent intervention for a period of 30 weeks for all three components - ST, CP and ED, as well as that of the Paired Samples t-test comparing pre-test and post-test scores of students in the Standard Stream enrolled in Term 4 (2016) and Term 1 (2017) in Table 6.2, suggest that it was generally successful for everyone with improvements noted in the results of most students.

Students who underwent intervention in (T1, 2017) were observed to have made the most improvement, followed by those in Terms 2 and 3. However, there was no significant improvement observed in the score difference across all components for students who joined in Term 3. Nevertheless, the moderate effect sizes suggest that the results could have been significant with a larger group or a longer duration of intervention.

On students' performance in Synthesis and Transformation (ST)

Of the three components, ST demonstrated the largest effect size of 0.71 and an overall improvement of +14.78% in students' post-test scores, suggesting that intervention has had a significantly positive impact on students' post-test performance. A possible

explanation for this lies in the generally higher predictability of skills and question types tested in this component, allowing for more explicit and cumulative teaching and practice of concepts and skills, as well as a direct application of strategies and ease of transference between questions related to the same topic. Students need to only identify the question type, and then make reference to a given sentence or sentences for every question tested. As such, their mental resources were focused on the tackling of individual questions making it a cognitively less demanding task to accomplish.

In comparing the three groups of students who received intervention for periods of 30, 20 and 10 weeks, significant difference in progress is observed only in students who received intervention for 30 weeks (p<0.001), suggesting that a longer duration of exposure to skills and concepts is necessary for students to demonstrate improvement. Specific concepts within a topic in ST were taught in a systematic and cumulative manner. For example, in the teaching of sentence transformation from direct to indirect speech, students were progressively taught to execute changes to pronouns, time reference, punctuation and verb tenses over several lessons within a single term to facilitate a gradual process of internalisation and mastery. The longer duration of progress monitoring would also have provided students with opportunities for practice, to correct and clarify any misconceptions and better reinforce their understanding of the topic through frequent and meaningful feedback given throughout the course of the intervention, leading to a deeper understanding and retention of concepts.

On students' performance in Editing (ED)

The ED component demonstrated an overall improvement with a mean difference of +11.25 between Post- and Pre-test scores and a medium but relatively smaller effect size (0.45) than the ST and CP components reflected in Table 6.5. A significant difference in students' performance, however, is observed in students who received intervention support for 30 weeks (p<0.001), relative to those who received support for 20 and 10 weeks as seen in Tables 6.6 and 6.7, suggesting that longer exposure to skills and concepts could have contributed to improvement in students' performance in this component. The smaller effect size could be attributed to the relatively fewer lesson hours allocated to this component i.e. a total of 1.5 to 2 hours as compared to ST and CP which took up about 4 hours of lessons each, out of ten weeks' worth of lessons in a term. Students were also taught a different topic in each lesson. Editing questions are also much less predictable. Despite exposure to phonogram concepts, spelling and suffixing rules, students may not have had exposure to age-adequate vocabulary to be able to identify spelling errors and apply learnt concepts accordingly. Moreover, some of the wrongly spelled words in this component tested students' ability to apply more than just one phonogram concept, spelling pattern or rule. Students with less developed cognitive flexibility may not be able to identify or retrieve the relevant concepts or rules to apply simultaneously. These, including the shorter lesson hours accorded for consolidation, could have resulted in the relatively lower effect size.

On students' performance in Reading Comprehension (CP)

As with the ST and ED components, the CP component also demonstrated improved students' scores with a Pre- and Post- test mean difference of +15.57, a large effect size of 0.70 (Table 6.5) and a p value of <0.001 (Table 6.6) observed in students who received intervention for 30 weeks, suggesting the benefits of longer exposure to reading comprehension skills that could have contributed to significant progress made by students. It is also interesting to note the striking improvement by the group who started in term 2, possibly because their starting score was extremely low and there was more ground to recover.

A particular reading comprehension skill and strategy that was taught and emphasised in the intervention programme is 'Referencing' (Table 4.2). Crisp, Johnson and Novakovic (2012) related some of the difficulties with text comprehension experienced by students with dyslexia, in particular, that of short-term memory and sequencing, with the use of pronouns. Students were taught to identify personal and demonstrative pronouns in the text and then link them to relevant nouns or noun phrases. Also known as reference-tracking, this strategy is said to be a useful mechanism for coherence-building (Pretorius, 2005; Walter, 2005, Gernsbacher, 1990, 1997) as it helps students to monitor comprehension as they read and process given texts. Students who had received intervention over 30 weeks could have benefitted from more opportunities to apply and practice this strategy, as well as other skills in tackling reading comprehension questions, such as identifying question needs and expectations, thereby building gradual confidence over time.

IMPLICATIONS

Data findings from this result proved useful to advocate for early and prolonged intervention in supporting students with dyslexia, specifically in tackling English examination questions in order for them to better cope with the demands of the primary school English language school and national exams. While 90% of students demonstrated improved scores, it is also worthwhile to note that 10% of students showed no improvement or attained lower scores than that of the Pre-test. Data gathered from their pre- and post- tests could be further analysed to identify areas where they may need additional support or modifications to instruction that would benefit their learning. There could also be other possible areas of language-learning challenges such as poor reading fluency or language impairments that need to be addressed and may interfere with the learning of specific strategies required to attempt particular question types.

LIMITATIONS

Students of the EESP were expected to make 'reasonable' progress defined by the learning outcomes and objectives for each topic or skill taught under each component,

that were already pre-designed in the EESP curriculum. This limits the measure of progress to an external criterion rather than against individual students' starting points or learning needs.

Due to the nature and structure of the programme, intakes for EESP generally differ from term to term, with the largest intake usually coming in at the start of the year in Term 1. It should be noted that there had been comparably smaller numbers of participants who had undergone intervention for 10 and 20 weeks, as compared to those who had 30 weeks of intervention.

Progress monitoring for EESP has been largely conducted on a termly basis, testing on skills learnt only during that particular term. In addition, although the number of hours dedicated to the teaching of each of the three components for each term is similar, the topics in each component differ from one term to another. The nature and level of difficulty experienced in each topic differs from student to student and may inadvertently also affect the understanding and application of skills during the post-test results - an area that warrants further study. Safer and Fleischman (2005) recommends progress monitoring to be conducted regularly, from a range of weekly to monthly and yearly basis. This may provide greater accuracy in tracking students' progress and ability to execute skills and concepts learnt over a longer period of time.

While all student participants have a diagnosis for dyslexia, some students could possibly have other unidentified learning needs that might hinder their progress, which were not accounted for during data collection.

RECOMMENDATIONS

The scoring criteria for the pre- and post- tests were carefully and uniquely designed to analyse students' ability to apply specific skills and strategies that have been taught in the programme. This allows students to know specific areas within a topic where they may lack knowledge or understanding and offers them opportunities to clarify, ask questions, practise and bridge the gaps. In reality, however, students' progress is measured differently in schools. Disparities exist in the marking scheme and measurement of students' progress in school and national English examinations, and that practised in the EESP programme. The marking criteria for the pre and post tests are determined by the number of skills students need to know and apply within each question, whereas in school-based and national examinations, students are awarded marks based on the accuracy of the answer as a whole. Despite the fact that the majority of students showed improvements in the post-test scores, further investigation could be undertaken if this translates to similar improvements in students' school-based and national-based examinations.

Many researchers have discussed the importance of setting targets and goals as a means of sustaining long-term progress and ensuring measurable outcomes for students. Hattie and Timperley (2007) highlight research which suggests that specific and well-defined goals make measures of progress more evident and reduce the gap between current and intended learning. Locke and Latham (2006) also identify the importance of specificity in relation to goal setting, emphasising that more challenging and specific goals may lead to a higher level of performance than vague and easy-to-achieve goals. Furthermore, Parkinson and Humphrey (2008) argue that any measure of success needs to be based on "visibly robust, replicable and definitively measurable" outcomes, demonstrated through the meeting of targets. Future research could involve a measurement of progress based on students' goal setting as a criterion.

Further studies on larger scales involving more grade levels or a more even sample distribution could be conducted to validate the generalization of the present findings of this study. Progress monitoring could also be made more frequent, using measures that could be easily administered and do not take away much of lesson time.

Multiple methods and formative assessments could also be developed and incorporated to measure progress of students in addition to the single-method, summative approach used in this research. Some examples of formative assessments would be goal-setting activities and game quizzes. These would provide further useful information for teachers to decide if it would be necessary to tweak the curriculum for students who may not demonstrate improved understanding or performance. Moreover, data in other non-examinable areas such as changes in students' self-perception, confidence, motivation and self-monitoring behaviours could also be observed and collected in future research. These are useful indicators of improvement in students' use of the English Language that would be worth investigating.

CONCLUSION

Findings from this study indicate that a structured support programme was effective in improving performance in English examinations for the vast majority of children with dyslexia. Progress monitoring assessment techniques should indeed be part of all assessment systems. The data obtained can be used by the teacher to enhance instruction (in small groups or one-on-one), reteach the material, or provide additional opportunities for the student to practice certain skills. Resources could also be committed to build the necessary skills and knowledge of all teachers in measuring and establishing progress of students. Educators need information that can be used to assess how students are doing against the grade-level standards throughout the course of the year so they can determine what needs to be done to accelerate their progress towards attaining proficiency standards (Quenemon, et. al., 2004). Progress monitoring assessments can provide that information.

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