

**The effectiveness of whole and part language instruction  
to improve word recognition with eight adolescents  
with mild intellectual disability**

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**ABSTRACT**

This two-month study used a single group pre-test and post-test research design to investigate the effectiveness of whole and part language instruction as a strategy to improve word recognition skills of eight adolescents with mild intellectual disability and low literacy skills. Word recognition is a major difficulty in disabled readers and it is a school concern (O'Connor, 2007). Through the use of meaning clues in the context of stories, the whole language instruction, the adolescents learn to recognize new words and word meanings. The adolescents were also taught to read by stressing on the acquisition of letter-sound correspondences through explicit instruction in blending letter sounds. The study was observed over a two time points, one before intervention and one after. Two standardized tests were administered as pre and post-test. Changes in the outcome of interest, that is, performance in word recognition measured by the standardized tests are presumed to be the result of the intervention. The Workplace Literacy national assessment scores were used to measure the performance of the subjects under study. The purpose is to find the link between student's achievement in Workplace Literacy Reading (WPLR) scores and student's ability to recognise words. No control or comparison group is employed. One reason is that the author was unable to find parents who would agree to put their children in a control group without any intervention. Taking into consideration the time constraints, the author felt that as an exploratory study it was a cost-effective way to discern if a potential intervention strategy was worthy of further investigation in the future.

## **INTRODUCTION**

Reading is arguably the most important academic skills children learn and it is a means of gaining knowledge about many different subjects and of understanding the world. It is considered a fundamental skill required for success today, especially in the developed world. The same opinion was reiterated in the report by the California task force on reading, every child a reader : "Reading is the most important academic skill and the foundation for all academic learning. If our children cannot read, they are on the road to academic failure. Teaching children to read must be our highest priority." Unfortunately, for many children with reading disabilities, learning to read is one of the most arduous and frustrating activities. All too often, the barriers they face outweigh their desire to read and, without an effective reading instruction or proper guidance, they never overcome them.

According to O'Connor (2007), word recognition is a major difficulty in disable readers and it is a concern to schools. In Singapore schools, including special education schools, there has been much emphasis on early intervention to solve the problem of struggling readers, but not enough has been done for the older ones. The literature is replete with studies that many children make adequate early progress in reading development, only to experience difficulties later (Phillips, Norris, Osmond & Maynard, 2002). The author felt that it is critical to recognize that there will always be students who will need continued support instruction beyond that provided in early intervention programs. There is a real need for a reading instruction to meet the learning needs and interests of older, struggling readers with intellectual impairment as these students are among those at risk of being left behind.

The students in the author's school are undergoing a programme that focuses on employment and vocational skills to prepare them to be integrated into the workforce and society. Hence, it is crucial to impart into these adolescents with special needs word recognition skills to enable them to recognise more words, new words and their meanings, and particularly functional workplace language so that they can lead full lives in the community and workplace. The teaching of these skills will help these adolescents to become well-prepared for open employment and for societal integration before they graduate at the age of 21. The ability to read

is crucial to the success of all students, including students with special needs, and to succeed in our society. Clearly, an effective reading approach to help older, struggling readers to learn to read is important.

The big challenge, obviously, is to get struggling readers to read. Students who experience disabilities learn with great effort or those who acquire English as their second or third language often find word acquisition a challenge. This leads the author pondering (i) how to go about teaching new words and word meanings to improve the literacy of adolescents without the literacy skills that are needed to advance in the workplace or to lead full lives (ii) how to critically analyse and identify a core of sight words which are most central to comprehension and useful for the adolescents to advance in the workplace or to lead full lives and (iii) how to maximize knowledge of research-based practices to design a reading strategy to help struggling readers to recognize high frequency sight words and word meanings to enable them to integrate into the workplace and community for post-school transition. The author strongly believes that a body of knowledge as such can contribute to our pedagogical knowledge of employing creativity intervention strategies to teach word recognition and word meaning to improve reading achievement.

The educational implication of the study is significant because it involves designing a reading instruction that is relevant to Singapore's school context and one that is intended to facilitate students' transition from school to the community and workplace. If the reading method and teaching resources proved successful in increasing the ability of students to recognize words and their meanings as well as improving their reading achievement, this localized reading package can provide our special needs students with a new support for the teaching of new words and their meanings. The study will benefit educators in special education services, our education minister, parents and anyone interested to establish effective model(s) of instruction to address adolescents who struggle to read or struggling readers in general.

## **PURPOSE OF THE STUDY**

The purpose of the study is to establish the efficacy of the whole and part language instruction to improve students' word recognition. For the purpose of this study, word recognition refers to the student's ability to recognize words and their meaning in context. The study aims to investigate the effectiveness of whole and part language instruction as a strategy to improve word recognition of adolescents with mild intellectual disability.

### *Research questions*

- 1) Does a combination of whole and part language instruction improve word recognition of adolescent readers with mild intellectual disability?
- 2) Does a combination of whole and part language instruction improve word meaning of adolescents with mild intellectual disability?

## **LITERATURE REVIEW**

### *Students with special needs and the implication to reading instruction*

Most students with special needs in Singapore are educated in the local schools alongside their age peers while being provided with a rich, balanced curriculum and support to meet their particular learning needs. According to the Special Educational Needs and Disability Act (SENDA) of 2001, a person has special educational needs if he or she has a learning difficulty which calls for special educational provision. In schools, teams of professionals including teachers/vocational trainers and support teachers, occupational, speech and language therapists and social workers provide extensive support for students with particular learning needs.

It is common for students with average abilities to show learning difficulties in reading. Students with reading difficulties have weak working memory and slow speed of processing. They may have deficits in their phonological and/or visual-perceptual skills. They may switch off easily and have difficulties with sequencing, orientation and organization (Wallach and Butler, 1994). Their difficulty has a neurological basis, and is independent of any sensory deficits, emotional and behavioural difficulties, or lack of learning experience. These students usually

respond successfully to appropriate teaching methods. Boyle and Scanlon, 2010 recommended effective instructional practices for students with mild disabilities to provide (i) clear and explicit instruction, (ii) frequent and reinforced instruction (iii) modelling or think-aloud (iii) structured instruction and (iv) informative feedback on the performance of the task from the teacher for example.

Methods of teaching and assessment in reading must be flexible to enhance participation and effectiveness of learning of students with special educational needs. Reading instruction can be enhanced through multi-sensory teaching such as reading a word aloud while tracing the character on a piece of sand paper simultaneously, hence involving auditory, visual, tactile and motor functions (Cunningham, 2000). To facilitate students' access to the curriculum and learning, accommodation in teaching and learning has to be made. Their memory can be enhanced through multi-sensory teaching and hands-on experience. It is also useful to adapt the curriculum through task analysis, present the learning in a structured and sequential manner and help students to master key words or high frequency words and basic language skills.

Developing reading skills through writing is another effective strategy as reading and writing are closely related. For students with learning difficulties in reading, learning to write and spell helps to develop their awareness of print conventions. It also makes them aware of the symbolic nature of print. Writing also helps to establish the connection between oral and written language. Research has shown that it is helpful to guide learners through the process of writing down what they can say about what they have experienced to improve reading (Bielby, 1998). Language experience makes concrete the connection between reading and writing through oral language.

Texts of the right reading level are essential for a particular reader. Choosing texts of the right difficulty and interest levels will encourage students to read and to enjoy what they are reading. Vocabulary, word length, grammatical complexity and sentence length are traditionally used to indicate the difficulty level of a text. The subject matter of a book is also an important factor. For instance, readers with substantial prior knowledge of a subject will be able to use their knowledge to read more difficult texts. Cultural factors are important when choosing books

for non-native speakers. Some children's books may contain references to situations, objects and experiences that are unfamiliar to non-native speakers. For both children and adults, native and non-native speakers, it is important to use authentic texts. This means materials written with readers in mind, not texts constructed to illustrate specific vocabulary or word forms. It is also important to use a variety of authentic texts, including both information texts and narrative or story texts. Students often have an easier time reading information texts when they can use their knowledge of the topic (Alexander, Jetton & Kulikowich, 1995; Bormuth, et al. 1970; Carver, 1994).

#### *Importance of word recognition skills and reading acquisition*

Word recognition is the ability of a reader to recognize written words correctly and virtually effortlessly. The development of word recognition skills promote fluent reading and comprehension and is often viewed as the antecedent to reading acquisition (Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001). It is found that fluent word recognition enables the reader to focus on key comprehension processes, such as making meaningful connections between sentences within a passage or relating text meaning to prior experiences and information (Fuchs, Fuchs, Hosp, & Jenkins, 2001). Beginning readers would benefit from systematic, explicit instruction in phonemic awareness by decoding skills (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Vellutino et al., 1996). Practising individual words is useful for readers at many different levels, a core of sight words enables beginning readers to read easy books and serve as a basis for learning phonics. This conveys that increasing both word recognition and word meaning is essential to reading comprehension and achievement, and it is one of the most visible aspects of language acquisition in children. Children will improve their reading if they recognise more words, new words and their meanings.

There is clear consensus among literacy researchers the ability to recognise words and word meaning is vital to reading achievement and comprehension (Thorndike, 1917; Davis, 1994). Word knowledge refers to the ability to recognise new words and their meanings. In fact many studies have documented the strong and reciprocal relationship between word knowledge and reading comprehension (Beck et al., 1987; Stahl and Fairbanks, 1987; Graves, 2000) and

general reading ability (Stanovich et al., 1984). Clearly, it is important that reading acquisition requires the teacher to identify a core of sight words to be taught when designing reading instruction to promote word recognition skills in struggling readers. By teaching our struggling readers to decode words and read connected text, they can be facilitated to master new words and meanings in context, thereby enhancing their reading ability.

#### *Instructions in sight words and reading achievement*

Sight words are defined as those words that are recognized instantly, without having to analyse them (Richek, Caldwell, Jennings and Lerner, 2002). When students have a good recognition of sight words their reading comprehension improves because they spend less time trying to decode. The learning of sight words is important as research has shown that 99% of the words in students' texts are sight words (Allington 2006).

Words are read by sight when the connection between the words in print and information about each word is made immediately and without conscious effort. An important goal of reading instruction is to enable readers to access information about words by sight. In the mind of a skilled reader, information is accessed so quickly that the reader is not fully aware that the information had to be retrieved from storage in his oral vocabulary (Burns, 2006). The reader sees the word in print, and the information just appears in his working memory. This implies that if a reader can recognise more words by sight, he can devote a much greater percentage of his working memory to make meaning of the collective meaning of all the words in the sentence. Thus, the reading ability of the reader is enhanced and very likely his reading achievement.

Studies have also shown that good readers have a good recognition of sight words and word meanings. In order to understand a text, readers need to know the meanings of individual words. They construct an understanding of the text by assembling and making sense of the words in context. Word knowledge or vocabulary is developed which is very important in learning to read and in future reading development. In later reading development, when students read to learn, they need to learn new words in order to gain new knowledge of specific subject matter (Nagy, Herman & Anderson, 1985; Nagy & Scott, 2000; Shu, Anderson & Zhang, 1995). In another word, there is a clear advantage that as the reader enlarges his storage of sight words,

he expands his understanding of word meanings and that enable the reader to improve his reading ability and reading achievement.

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### *Research about whole language and part language*

Whole language describes a literacy philosophy which emphasizes that children should focus on meaning and strategy instruction. It is often contrasted with part language, the phonics-based methods of teaching reading and writing which emphasizes instruction for decoding and spelling (Burns, 2006).

Proponents of both whole and part language advocate that children with reading problems can best learn to recognize words by reading them in context. However they may also need additional practice with words in isolation to reinforce automaticity and give them a sense of progress. Bruce & Pine (2010) suggests that practising individual words is useful for readers at many different levels and a core of sight words enables struggling readers to read easy books and serve as a basis for learning phonics. Surveys of practicing teachers find the majority used a balanced reading instruction, combining of basal reading programs and skills based instruction (Baumann et al., 1998; Worthy & Hoffmann, 1997; Presley, Rakins & Yokoi, 1996).

The importance of both whole and part language approaches have also been emphasized in many studies (Snow, Burns & Griffin (1995), Adams (1994 & 1995), Cooper & Hedges (1994) and National Institute of Health & Human Development (2000). Snow, Burns & Griffin (1995) asserts that no one approach, whole language or part language, to teaching reading is best for every child. According to Adams (1995) using a single approach to reading generally does not work. During the 1980s and 1990s, the Congress commissioned reading expert Marilyn Jager Adams to write a definitive book on the topic. She determined that phonics was important but suggested that some elements of the whole language approach were helpful

(Adams, 1994). Cooper & Hedges (1994) advocated a reading programme that combines both whole language & phonics instruction is necessary to provide an optimal learning environment for readers of different learning styles.

Whole language and phonics based instruction is suitable as the targeted strategy for intervention in the study because a review of research on strategies to word recognition and reading has advocated the use of both approaches, particularly working with students with learning difficulty (O'Connor, 2007). The whole language with phonics instruction use meaning clues in the context of literature and stories while integrating systematic, explicit phonics instruction. Students with reading difficulty can best learn to recognize words by reading to them in context and with additional practice with words in isolation to reinforce automaticity.

## **METHODOLOGY**

### *Design*

This study used the single-group pre-test/post-test quasi experimental research design. It is considered most suitable when pre and post-tests are used to determine the efficacy of the treatment at the beginning and at the end of the treatment using part and whole language strategy. Because the design requires an introduction and completion of the treatment, the functional relationship between the part and whole instruction as a treatment strategy and students' ability to recognize and read words could be established and studied (Tawny & Gast, 1984). Changes in the outcome of interest, that is, performance in word recognition measured by the standardized tests are presumed to be the result of the intervention. These data were taken when using the design:

- 1) Does a combination of whole and part language instruction improve word recognition of adolescent readers with mild intellectual disability?
- 2) Does a combination of whole and part language instruction improve reading achievement of adolescents with mild intellectual disability?

### *Subjects*

There were 8 subjects (6 males and 2 females) in the study, all attending special school during the time when the study was conducted. The subjects were adolescents with mild intellectual disability with IQ range of 50 to 70, aged 17 years and who face difficulties in recognizing word and its meaning in context.

### *Setting*

Before the start of the study, a pre-test was conducted with the Year One cohort, on a one-to-one basis to obtain the number of sight words they could read using the 300 high frequency sight words in the MULTILIT word list. There are 81 Year One students, all aged 17 years old who participated in the pre-test. The result of the pre-test was recorded in the Sight Word Recording Sheet. From the result of the pre-test, eight subjects were identified for the study. The pre-test was also used to compare the progress of the eight subjects on their ability to recognise words and their meanings before and after the treatment strategy using the MULTILIT high frequency sight words.

The eight subjects were identified based on one criterion: have obtained grade 2 or 3 in the Workplace Literacy Reading (WPLR) national assessment. The descriptors of the WPLR assessment scores are as follows:

- 1) Descriptor of WPLR grade 1 : may not be literate in English.
- 2) Descriptor of WPLR grade 2 : recognise and understand common sight words.
- 3) Descriptor of WPLR 3: read a limited number of basic sight words and simple phrases related to immediate needs.
- 4) Descriptor of WPLR 4: read and interpret simple directions, schedules, signs, maps and menus

Subjects who fell into the category of descriptor grade 2 and 3 were considered because they could either recognize/understand or read a limited amount of basic sight words as defined by the WPLR national assessment standard. Seven subjects fell into the category. Students in the descriptor of grade 1 were not considered because they may have severe language disabilities that require special intervention by the Speech and Language Therapist. One subject who fell into descriptor grade 4 and had obtained the lowest number of sight words vocabulary

was chosen for the study since we could accommodate eight subjects in the study. It was found that all the eight subjects can read sight words ranging from 190 to 257 out of 300 word in the MULTILIT word list (refer to Appendix A).

### *Teacher Researchers*

Eight teacher researchers were involved. They had not received formal teacher training in special education. Their teaching experiences range from one year to two and a half. To ensure quality curriculum and pedagogy, weekly observation by the author to ensure that teacher researchers complied with training procedures was conducted during the initial phase of the training, then once fortnightly. The training procedure was calibrated leading to the creation of structured lesson for all the teacher researchers in order to reduce infidelity in implementation. Although the content and instructional design features of the intervention strategy were essential to the success of the intervention, it was critical that the teacher researcher received training and ongoing coaching to implement the program well. In the month before the intervention, the teacher researchers received 2 sessions of 3-hours training on teaching phonics and motivating students. The training comprised an overview on reading acquisition and phonics instruction. A school Speech Therapist conducted the training.

### *Procedures*

The eight subjects who were identified for the study were given two treatments: Phase 1 treatment and Phase 2 treatment.

Phase 1 treatment: July to August 2010

1) Eight subjects undergone phase 1 treatment for one month, from July to August 2010.

2) The treatment strategy was applied using 300 sight words from the MULTILIT word list

Phase 2 treatment: August to September 2010

1) Four subjects (S1, S2, S3 and S6) out of the original eight subjects follow up with phase 2 treatment for one month, from August to September 2010. The subjects were selected because they had completed the phase 1 intervention and mastered the 300 sight words in the MULITLIT word list. They demonstrated the ability to recognize the 300 sight

words and their meanings. The remaining four subjects who did not meet the criterion for phase 2 treatment were not included in phase 2 intervention

2) In phrase 2, 100 words related to vocational field were taught.

The schedule of treatment for phase 1 and 2 was implemented on one-to-one condition.

#### Phase 1

Eight subjects received a weekly one-to-one treatment. S1 to S4 received an hour intervention weekly while S5 to S8 received 45-minute intervention twice a week. All the subjects attended the session as a pull out program during the school day at a time that their teachers determined would not interfere with key classroom instruction for a month. Different schedule was assigned to the eight subjects owing scheduling limitation, having to fit treatment sessions to the teaching schedule of teacher researchers.

#### Phase 2

Four subjects received a weekly one-to-one treatment comprising one-hour as a pull out program during the school day at a time that their teachers determined would not interfere with key classroom instruction for a month. Different schedule was assigned to the four subjects was a result of scheduling limitation, the subjects having to fit the teaching schedule of the teacher researchers.

#### *Instrumentation* (MULTILIT recording sheet/checklist)

This instrument comprises 300 high frequency sight words. The words were chosen because they are the high frequency words an early reader uses for everyday conversation and words which occur most frequently in written materials. They are words that often have little meaning on their own, but can contribute a great deal to the meaning of a sentence. Learning to recognize high-frequency words by sight is critical to developing fluency in reading. Researchers reckon that learning 100 high frequency words gives an early reader access to 50% of virtually any text, whether a children's book or a newspaper report.

The instrument was used as the pre-and-post assessment in phase of the treatment. This was to measure the number of sight words the subjects could read and the words were

administered on a one-to-one basis by the teacher researcher and the result of was recorded. The words in the word list are arranged in order of difficulty.

#### Vocational recording sheet/checklist

This instrument comprises 100 “high frequency sight words” that were commonly used in the workplace. The words were chosen because they reflect the curriculum taught in the vocational school. The instrument was used as the pre-and post assessment in phase 2 of the treatment. The 100 sight words in the vocational field were administered on a one-to-one basis by the teacher researcher and the result was recorded. The words in the word list are arranged in order of difficulty. The order of word difficulty was established when sampling was administered to thirty Year 1 cohort at random.

#### *Treatment*

The primary aim of the treatment in the study was to improve word recognition and word meaning as well as reading achievement of the subjects. According to O’Connor (2007) and Cooper and Hedges (1994), reading instruction that combines both whole language & phonics instruction is necessary to improve word recognition and word meanings for readers of different learning styles, particularly working with students with learning difficulty. Cunningham (2000) suggested that instruction in sight words can be enhanced through multi-sensory teaching by involving auditory, visual, tactile and motor functions. The treatment strategy in this study carried the following key features:

- 1) Systematic, explicit phonics instruction to promote automaticity with words in isolation.
- 2) Teach sight words using the Visual-Auditory-Kinesthetic-Tactile (VAKT) method by asking the subject to say the name of each letter word and to trace each letter with his or her finger on the sand tray or in the air simultaneously before covering the word to spell it on paper.
- 3) Sight word games were used to promote quick word recognition and reading success.
- 4) Choral or guided reading using meaning clues from a big book for understanding of word meanings

- 5) Recognition of words was reinforced through VAKT method such as think aloud or writing or spelling.
- 6) Diagnostic assessment by recording and analyzing a student's errors with word lists or flash cards to guide teaching

### *Materials*

The instruction materials that are used in the treatment study included the following :

- 1) Student recording booklet / recording sheet
- 2) Flash cards
- 3) Picture flash cards
- 4) Bingo games
- 5) Word search
- 6) Close passage
- 7) Story books
- 8) Mini white board
- 9) Whiteboard marker
- 10) Sand tray
- 11) Pen and paper
- 12) Homework list (list of words taught during the lesson)

The author and the teacher researchers designed the materials to ensure texts of the right ability and interest level were used to motivate our subjects to enjoy the learning process. It is also our intent to select themes that relate to vocational interest and recreational pursuits to prepare our subjects for post-school transition. Another reason was to incorporate experiences that are unfamiliar to our local context so that the subjects could have easier time to understand the information and use their knowledge of the topic .

### **RESULTS**

The aim of the study is find out if whole and part language instruction could be effective in improving recognition in adolescents with mild intellectual disability. It must be noted that the

number of students was eight at the pre-test. Towards the end of the study, one subject (S8) did not sit for the WPLR national assessment owing to ailment. The number of subjects was reduced to 7 at the 2<sup>nd</sup> post-test phase.

*Measures on Word Recognition and Word Meaning: Phase 1*

At the end of the first month of intervention, all the eight subjects who received the treatment session performed better on measures of word recognition (Appendix B) and word meaning (Appendix C) when assessed using the MULTILIT sight words.

*Measures on Word Recognition and Word Meaning: Phase 2*

At the end of the 2<sup>nd</sup> month of intervention, all the four subjects who received the treatment session performed better on measures of word recognition (Appendix D) and word meaning (Appendix D) when assessed using the Vocational sight words.

*Measures on Reading Achievement: Phase 1 and Phase 2*

There was also positive effect on students reading achievement as measured in the WPLR assessment score for reading achievement at the end of phase 1 and 2 intervention. The result is in Appendix E). Five subjects (S1, S2, S3, S6 and S7) who received individualised instruction and completed the treatment session improved in their WPL Reading score. Two subjects (S1 and S3) improved from grade 2 to 4. According to the descriptor of WPLR assessment standard it would mean that S1 and S3 had advanced from recognising and understanding common sight words to reading and interpreting simple directions, schedules, signs, maps and menus.

Three (S2, S6 and S7) improved by one grade. S2 and S6 had advanced from grade 3 to 4. According to the descriptor of WPLR assessment standard it would mean that S2 and S6 had advanced from reading a limited number of basic sight words and simple phrases related to immediate needs to recognising and understanding common sight words to reading and interpreting simple directions, schedules, signs, maps and menus. S7 had advanced from grade 2 to 3. It would mean by the WPLR assessment standard, S7 had advanced from recognising and understanding common sight words to reading a limited number of basic sight words and simple phrases related to immediate needs. Two subjects (S4 and S5) did not

complete the programme because of their training sessions coincided with other school events or they were on medical leave. One subject (S8) did not sit for the assessment due to ailment.

To document fidelity of implementation, we observed the teacher researcher weekly during the first two weeks of supplemental instruction and once a week thereafter. The author documented how closely the teacher researchers followed the lesson plan. Observers also kept a tally of student errors and teachers' corrective feedback. The teacher researchers completed the recording sheet of each subject weekly to chart subjects progress before the cumulative review was submitted for data collection. They also noted any disruptions in the course of the treatment and language difficulty that the subjects encountered during the intervention.

Across observations, lessons were followed with 90% to 100% fidelity. The author met individually with the teacher researcher to give them feedback on their instruction and to discuss questions or concerns with particular subjects after the lesson weekly. Additionally, the author and the teacher researcher also met as a group weekly to practice and refine instructional approaches and to discuss the progress of individual subjects.

## **DISCUSSION & CONCLUSION**

Whole and part language instruction improves word recognition and reading achievement in struggling adolescents with mild intellectual disability. The results support the correlation between phonological awareness and word recognition and meaning. The treatment strategy improves reading achievement in the subjects who completed the reading intervention. Word recognition using whole and part language in meaningful context has contributed to improvements in reading achievement. Taking into consideration the time and manpower constraints, the author felt that as an exploratory study it was a cost-effective way to discern if a potential intervention strategy was worthy of further investigation in the future.

Subjects who are identified as having reading disabilities benefit from systematic, skill-based instruction and whole language approaches. The subjects benefitted from an instruction that is characterized by intensive one-on-one with attention to both word recognition and word meaning process, thoroughly individualized assessment and instructional planning, and

extensive experiences with an array of texts and materials that were localized to meet their learning needs.

Reading and writing are also closely related. Reading skills is developed through writing, is an effective strategy to develop an awareness of print and establish the connection between oral and written language. Research has shown that it is helpful to guide readers through the process of writing down what they can say about what they have experienced (Wallach and Butler, 1994).

It was noted that S1 and S3 achieved a 2-point jump in the WPLR grade. Both received treatment in the MULTILIT and vocational sight words, vocational sight words forms the school curriculum. This denotes that additional instruction using the whole and part and language strategy is effective in enhancing word recognition and reading achievement. It also denotes that students with limited high frequency words can be taught the words first to facilitate them to learn another set of core sight words that are related to their curriculum to enable them to achieve academic efficacy. In the case of this study, four subjects had at phase 2 learnt vocational words that are needed to advance in the workplace for post-school transition. Therefore, the treatment strategy has high transferability to any struggling reader who to increase vocabulary acquisition, but also to increase reading skill so long as the core sight words meet the functional needs of the curriculum of the student.

Researching this topic has helped the author learn new teaching strategies and understand ways to modify the curriculum as instructional leaders working with students with learning disabilities. Knowledge is also constructed when the author researched useful techniques and models to help students to read. As a result of the study, the author has created an instructional model (Appendix F) to guide teaching practice in reading instruction. It is practical and sustainable as there is clear strategy and guidance for all teachers involved in teaching. By investigating the current research, the author apply inquiry into practice.

Given limited study on reading instruction to improve reading ability in struggling adolescent readers with mild intellectual disability, this study contributes to better understanding of the development of the reading process in terms of learning words and word meanings.

Hence, the author's hypothesis that whole and part language approach can improve word recognition and word meaning is supported. However, there may be several possible factors that support the hypothesis. The use of multisensory strategies and small teacher-pupil ratio (one-to-one intervention) and good resource materials has encouraged the subjects to interact with the learning.

The teacher researchers play a critical role in facilitating the subjects to acquire and apply the skills learnt. The effectiveness of the intervention depends to a great extent on how skilful and experienced the teacher researchers are in facilitating the learning process. Teachers who are new and less experienced to special needs will benefit from mentoring and coaching. A structural approach to teaching and support to dialogue issues encountered in teaching as well as an environment for continuous learning can serve to ensure quality curriculum and pedagogy (as reflected in good teaching practices resulting from dialoguing issues encountered during teaching and calibrating the teaching process in the study). An avenue for professional conversation, therefore, is important to the professional growth of teachers.

Another observation made was that efforts to foster positive learning experiences for students need to do more than simply setting standards for students, structuring experiences in a way where students interact with the materials in meaningful context through whole and part language instruction using multisensory strategies is an important element for success. Feedback from the teacher researchers indicated that a higher level of energy was observed during the treatment sessions than when the subjects learnt in the classroom since the use of word games word, learning strategies are interesting and playful enough to engage students and so they will learn. This indicates that motivation to learn can be provided by incorporating more interesting and meaningful tasks for sustained learning outcomes. Cognitive engagement can be enhanced by employing research-based instructional practices to increase academic efficacy. The interplay between the teacher's effort, strategic activities and task performance are interlinked for successful learning.

*Implication of the study to teacher education*

Reading instruction emphasizing phonological awareness, decoding, and word-recognition skills can be incorporated as a core module, instead of a elective module, for teacher training in Singapore Teacher Training College. This is can be one of the ways to address the problems of students with reading disabilities. Research shows that well-trained teachers providing sustained, intensive instruction can significantly improve the reading skills of students with learning disabilities.

#### *Limitations of the study*

Clearly, whole and part language approach is an effective approach to improving word recognition and word meaning, however it has to be added that multisensory teaching has added variety and interest to student learning. The small sample sizes pose a problem to valid analyses since the analysis was based on five subjects. Small sample sizes can undermine the reliability and validity of the findings.

#### *Directions for future research*

The intervention strategy is promising, especially for students with mild severe learning disabilities. Such intervention is possible to accomplish in the context of the regular classroom when carefully planned to include interactive learning leading to active construction of knowledge. It also requires teachers thoroughly trained in reading instruction emphasizing phonological awareness, decoding, and word-recognition skills.

Another important direction for future research would be exploration of training the parents to impart the reading instruction to support their children in learning. That is empowering the parents to support their children to accelerate vocabulary acquisition. Parents too, can be equipped in reading instruction that emphasizes on phonological awareness, decoding, and word-recognition skills.

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APPENDIX A

**Subjects selected for Treatment at Phase 1 : Pre-and-Post test results**

Samples	* No. of MULTILIT sight words recognised (read)		
	Pre-test Before treatment	Post-test After treatment	WPLR assessment score (2009)
Sample 1	257	300	2
Sample 2	243	300	3
Sample 3	239	300	2
Sample 4	236	292	4
Sample 5	215	289	2
Sample 6	207	300	3
Sample 7	199	288	2
Sample 8	190	240	2

APPENDIX B

**Measures on Word Recognition (read)**

**Phase 1**

Subjects	Gender	Start Date	End Date	Treatment hours	Frequency	No. of MULTILIT words recognized (read)	
						Before treatment	After treatment
S1	F	05/07/10	26/07/10	3h	1h / once a week	257	300
S2	M	5/07/10	02/08/10	4h	1h / once a week	243	300
S3	M	09/07/10	30/07/10	4h	1h / once a week	239	300
S4	M	05/07/10	26/07/10	2h	1h / once a week	236	292
S5	M	12/07/10	27/08/10	3h	45 min twice a wk	215	289
S6	M	05/07/0	23/07/10	4h 30m	45 min twice a wk	207	300
S7	M	12/07/10	27/08/10	5h	45 min twice a wk	199	288
S8	F	09/07/10	03/09/10	7h 30m	45 min twice a wk	190	240

**Measures on Word Recognition (meaning)**  
**Phase 1**

Subjects	Gender	Start Date	End Date	Treatment hour	Frequency	No. of words recognized (meaning)	
						Before treatment	After treatment
S1	F	05/07/10	26/07/10	3h	1h / once a week	257	300
S2	M	5/07/10	02/08/10	4h	1h / once a week	243	294
S3	M	09/07/10	30/07/10	4h	1h / once a week	239	300
S4	M	05/07/10	26/07/10	2h	1h / once a week	236	247
S5	M	12/07/10	27/08/10	3h	45 min twice a wk	215	272
S6	M	05/07/0	23/07/10	4h 30m	45 min twice a wk	207	280
S7	M	12/07/10	27/08/10	5h	45 min twice a wk	199	281
S8	F	09/07/10	03/09/10	7h 30m	45 min twice a wk	190	213

**Measures on Word Recognition (read)****Phase 2**

Subjects	Gender	Start Date	End Date	Duration	Frequency	No. of words recognized (read)	
						Before treatment	After treatment
S1	F	06/08/10	03/09/10	4h	1h / once a week	54	65
S2	M	02/08/10	30/08/10	4h	1h / once a week	51	53
S3	M	02/08/10	30/08/10	4h	1h / once a week	38	39
S6	M	02/08/10	30/08/10	4h	45 min twice a wk	31	99

**Measures on Word Recognition (meaning)****Phase 2**

Subjects	Gender	Start Date	End Date	Duration	Frequency	No. of words recognized (meaning)	
						Before treatment	After treatment
S1	F	06/08/10	03/09/10	4h	1h / once a week	54	62
S2	M	02/08/10	30/08/10	4h	1h / once a week	51	50
S3	M	02/08/10	30/08/10	4h	1h / once a week	38	38
S6	M	02/08/10	30/08/10	4h	45 min twice a wk	31	89

**Measures on Reading Achievement**  
**End Phase 1 and Phase 2**  
**All the 8 subjects**

Samples	WPLR Score		
	WPL Reading Grade 2009 (Before intervention)	WPL Reading Grade 2010 (After intervention)	Outcomes of the intervention
Sample 1	2	4	↑ by 2 grades
Sample 2	3	4	↑ by 1 grade
Sample 3	2	4	↑ by 2 grades
Sample 4	4	3	Did not complete the programme
Sample 5	2	2	Did not complete the programme
Sample 6	3	4	↑ by 1 grade
Sample 7	2	3	↑ by 1 grade
Sample 8	2	Did not sit for the WPLR assessment	

**Measures on Reading Achievement**  
**End Phase 1 and Phase 2**  
**All the 4 subjects**

Samples	WPLR Score		
	WPL Reading Grade 2009 (Before intervention)	WPL Reading Grade 2010 (After intervention)	Outcomes of the intervention
Sample 1	2	4	↑ by 2 grades
Sample 2	3	4	↑ by 1 grade
Sample 3	2	4	↑ by 2 grades
Sample 6	3	4	↑ by 1 grade

### **Model of instruction**

<b>Design</b>	<b>Purpose</b>	<b>Who Lead</b>	<b>Who Respond</b>
Pre-test	Establish baseline	Teacher	Student
Show-and-tell	Change behaviour	Teacher	Student
Try out	Evaluate respond	Student	Student
Follow up	Reinforce respond	Student	Student
Post-test	Check for mastery	Teacher	Student