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SOUND ENCODING AND SYLLABLE BLENDING GAME: FUN LITERACY LEARNING FOR REMEDIAL STUDENTS

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Abstract

Teaching remedial students basic literacy skills continue to challenge teachers due to students' short attention span and memory deficits. The conventional method of teaching Malay syllable sounds by memorising the combination of letters are difficult and tedious for these students with special needs. In the teaching practicum, the second author found two of her remedial students having difficulty reading words with simple syllable sounds even after 2 years in schools. Thus, an action research was conducted with these students as the research participants. Instead of using the conventional method, the authors decided to teach Malay sound awareness followed by teaching letters which represent the sounds using animated association approach. The participants were first taught the 6 vowel sounds in Malay using 6 interesting animated songs devised by the first author based on the Malay Early Literacy Instructional Model. The students were very much attracted by the fun videos and could easily remember letters (codes) which represented the respective vowel sounds. Next, students were introduced to five consonant sounds (sonorants). Subsequently, sound blending was taught using an animation game (*Plant and Grow*) designed by the second author. Through this method, instead of memorising 30 syllable sounds (5 consonants x 6 vowels), participants need to only recognise 11 phoneme-grapheme correspondences to form 30 syllable sounds without tedious memorisation but acquisition of sound blending skills. Significant improvement was seen in both participants in their phonemic awareness, phonemegrapheme correspondence, syllable reading and word reading tests conducted right before and immediately after only three weeks' intervention. Most importantly, these students regained confidence and interest in literacy learning. The findings suggest that reading and spelling can be taught through fun and easy sound coding to ease the cognitive processing load of remedial students.

Keywords: Literacy learning, remedial students, animated game in education

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Introduction

Learning to read and write is not a natural ability like learning to speak and understand a language (Sousa, 2011). This is evident as writing systems existed much later in human history. Language devices inherent enable any native speaker of a language to produce and retrieve phonological structures through automatic functioning processes below the conscious level (Shankweiler & Lundquist, 1993). In contrast, writing or reading requires explicit understanding of the writing system. In an alphabetic writing system, a child must explicitly or implicitly gain knowledge on how letters and the sequence of letters correspond to speech segments (Ng & Yeo, 2013a). While many children can learn to read and write effortlessly, there are some who face difficulties in literacy learning due to deficiencies in physical, biological, linguistic, poor socioeconomic background, underprivileged environment or even ineffective instructions (Munro, 2008).

As Yeo (2006) pertinently asserted, "*Reading difficulties will not fade away unless effective measures are undertaken to intervene the problems faced by the child*". Children who have difficulty in mastering basic literacy skills of language by the end of first grade begin to feel less confident about their abilities. As they proceed in the schooling years, this will directly leads to literacy motivation declines even further. Therefore it is essential to focus our attention on the early literacy learning as there is evidence which supports that well-designed early intervention programmes can prevent the development of long-term literacy difficulties (Wanzek & Vaughn, 2007).

Teaching and Learning Reflection

From the experience of teaching remedial students the national language (Malay) in primary schools during different phases of practical teaching, it is found that most of the students have not much difficulties in remembering all the 26 graphemes (A to Z), be it the national primary schools with Malay medium or national-type primary schools with Chinese medium. In most cases, they have no problem to identify or categorise the letters (graphemes) into vowels and consonants. However, many students encounter difficulties in reading syllables and words although they can easily recognise the letters.

In addition, students are often confused by some of the letter names and their respective sounds. For example the phoneme <i> is spelt as "e" while the phoneme <e> is spelt as "a". This is apparent when students are required to fill in the blanks with initial vowels of the objects shown in pictures. Students often mistakenly spell '*ibu*' (mother) for '*e*bu' while the word '*ekor*' (tail) has been spelt as '*a*kor'. These mistakes indicate that students have problems in associating letter sounds and letter names. It also shows that teaching strategies that prioritize the skills to recognise the letters of the name not only does not help reading skills, but also slow down the process of decoding and encoding syllables and words (Ng, 2014a).

Besides, students are also confused by the sound of consonants that are almost identical in terms of shape or sound, such as 'm and n', 'l and r' as well as 'g and j'. For example, when students were asked to spell the syllable <la>, he spelled "r" + "a" = <la>. This indicated that these students have not mastered letter-sound relationship.

Observation and interview with teachers who teach Malay in the schools revealed that teachers generally prefer using CV Chart (consonant + vowel) as teaching aid to teach open syllable sounds for beginners. Students learn to memorise the syllable sound, by reading out the name of each letter in the syllable before pronouncing it. For example,
"b" + "a" = <ba>, "b" + "i" = <i>, "b" + "o" = <bo>, "b" + "u" = <bu>, "b" + "e" = <be> and "b" + "é" = <bé>. When students are asked to spell the word "*bapa*" (father), they will say, "b" + "a" = <ba> "p" + "a" = <pa>; <bapa>.

Most of the remedial students can spell the open syllables after lots of drilling despite doing it at a slow pace. However, they often face problems to blend the syllable sounds to form a word. They used to forget the sound spelt when the students take longer time to spell each syllable. The observed problem indicates weaknesses in alphabetic approach used by teachers which is not suitable for remedial students who have limited short-term memory because students need to memorise all the combinations of syllables to read words (Ng, 2013).

In short, remedial students are found to have short attention and memory span. They need lots of practice to recall and retrieve information. They face problems when the literacy teaching approach does not take advantage of its orthography and cater to their special needs. As Malay has multisyllabic words and predictable structure, it is therefore more viable to focus on the sight recognition of the syllables to reduce cognitive load of learners to remember sounds in working memory while blending the sounds to form words (Ng, 2013).

Research Focus

Current Malay early literacy instructional approach uses conventional alphabetic method which focuses on letter-name knowledge, syllable segmentation, and syllable sound memorisation (Lee and Wheldall, 2011; Ng & Yeo, 2012). This demands strong memory to remember audio and visual representation, ability to receive abstract ideas (symbols and sound), and emotional maturity (Ng, 2014b). Children not only need to know names of every letter, but also require to master skill to segment word into syllables and recall all the spelt syllables to form word. There is a little or no emphasis on phonological awareness, grapheme-phoneme correspondence or automaticity using this approach. Instead, there is a strong emphasis on learning of syllables as basic sound units through repetition and drilling. Apparently, this approach does not take advantage of unique features in Malay orthography. Using syllable chart or flashcards can reinforce the learning of syllables sounds, but the process is tedious and time consuming. To acquire the skills to read a two-syllable word (CV + CV), the students have to remember the sound of syllables spelled prior to pair two syllable sounds to form words that are spelled. For remedial students, this process is a challenge because it requires a large capacity of short-term memory capacity. Apparently, when students make mistakes even the process of spelled and pronounce correctly [e.g., 's'+ 'i' = <si>; 'k' + 'u' = <ku> read <*kuku*> (nail) instead of <*siku*> (elbow)]. This issue has become a major obstacle for remedial students to learn Malay properly and effectively. Thus, the researchers plan to help remedial students of Year Three to solve this problem using phonics approach so that they can read and write properly, quickly and smoothly.

The research focused on vowel sound (<a>, <u>, <i>, <o>, <e>, <é>) and five consonant sound (<s>, <l>, <m>, <n>, <r>) as suggested by Ng (2013). Vowel sounds were chosen because they are the basic of all phonemes, while another five selected consonant sounds (sonorant letter) are more easily pronounced phonemes to enable understanding of sound blending. Students will learn blending consonant and vowel sounds (e.g., <sss> with <aaa>) and also the segmentation of sound syllables <sa> to sound consonant <sss> and the vowel <aaa>. Blending and segmentation of phonemes in phonics approach reduces the cognitive load of students to memorise the sound of the syllables with the alphabet.

To overcome the problem of remedial students in memory, animated songs were used to introduce vowel sounds and sonorant letter sounds as suggested by Ng (2014b). This approach combines letter names, letter sounds and letter shapes with songs and video animations. In addition, an animated game TdT ("*Tanam dan Tumbuh"* or "Plant and Grow") was designed using *Microsoft PowerPoint* to help students master the technique of blending phonemes to form syllables. With this intervention, students do not need to spell and memorise 30 sounds of syllables (5 consonants x 6 vowels). Instead, they just need to know the 11 phonemes (5 consonant phonemes + 6 vowel phonemes) to read the syllable directly without spelling it out.

Therefore, the aim of this action research was to improve remedial students' phonological awareness, grapheme-phoneme correspondence, syllable reading and word reading skills, focusing on words with open syllable CVCV structures using animated songs and animated blending game.

Methodology

This study applied an action research design which involve cycles of analysis, reconnaissance, reconceptualization of the problem, planning of the intervention, implementation of the plan, and evaluation of the effectiveness of the intervention (McKernan, 1991). Meyer (2000) describes action research as a process that involves people and social situations that have to ultimate aim of changing an existing situation for the better.

Participants

Two students from a remedial class of a national primary school in an inner city of West Malaysia involved in this study (2 boys; mean age 8.5 years old). These two participants were native speakers of Malay and came from low socioeconomic family backgrounds. They were in Year 3 but screening test beginning of the year showed that they had not acquired the basic literacy skills in reading and writing. Both participants could recognise and name all alphabets but they have problems in syllable reading and spelling. They could only recognise some open syllables and a few simple words but reading the words seem slow and laborious. Both of them showed low motivation in learning but were very much attracted when computer was incorporated in the remedial lessons.

Data Collection Method

The researchers intend to evaluate the effectiveness of the intervention by using a Malay Literacy Test adapted from Ng (2013) which comprises of four parts. Part 1 is the phonological awareness test with 10 items. Participants are to select from the given pictures the similar initial sound as the stimulus in the green box (Figure 1).

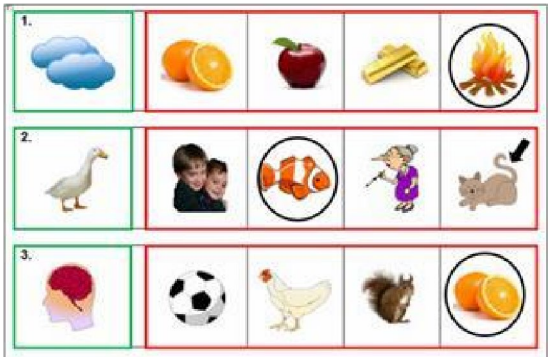

Figure 1 - Examples of items for phonological awareness

Part 2 is the grapheme-phoneme correspondence test with 15 items. Participants are required to write the corresponding letters for the pictures shown (Figure 2).

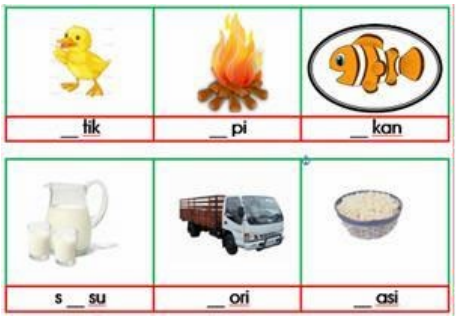

Figure 2 - Examples of items for grapheme-phoneme correspondences

Part 3 is syllable reading test with 30 open syllable items (5 consonants x 6 vowels). Participants are required to read the syllables shown (Figure 3). Marks will be recorded for number of correct syllables as well as number of correct phonemes.

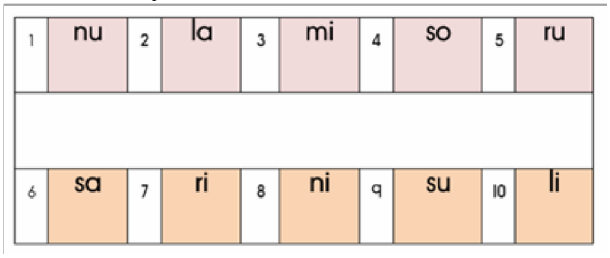

Figure 3 - Examples of items for syllable reading

Part 4 is word reading test with 10 items. All 10 items are words with CVCV structures. Participants are required to read the words shown (Figure 4).

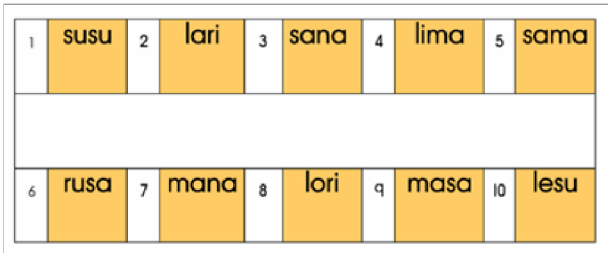

Figure 4 - Items for word reading

Intervention Procedures

The intervention was designed based on the Malay Early Literacy Instructional Model (Ng, 2013) (Figure 5). Based on this model above, animation songs were used to introduce the grapheme-phoneme correspondences (GPC) and phonological awareness (PA). It began with the six vowel sounds. With animated songs, participants leant to associate vowel sounds with their corresponding graphemes (GPC). Participants were then guided to associate the phonemes with objects with similar sounds in the environment to enhance phonological awareness (PA). Activities like "treasure hunt" and "how do I spell...?" were played for skill reinforcement and automatic syllable reading (ASR).

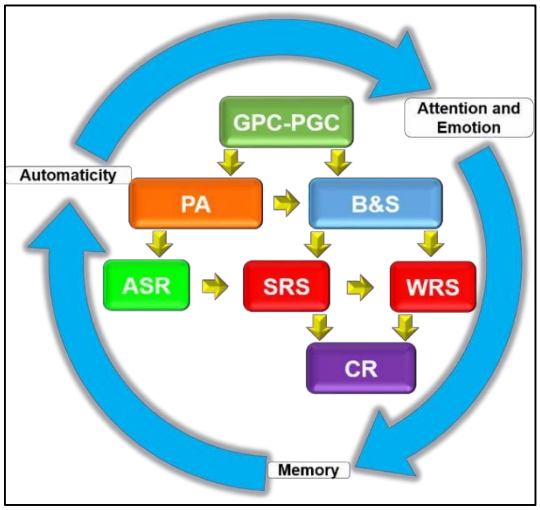

Figure 5 - Malay Early Literacy Instructional Model (Ng, 2013)

Note:
GPC=Grapheme-phoneme correspondences SRS=Syllable reading and spelling
PA=Phonological awareness WRS=Word reading and spelling
B&S=Blending and Segmentation ASR=Automatic syllable reading
CR=Contextual reading

After mastering all vowel sounds and the corresponding graphemes, consonants were introduced (s, m, n, l and r). These are sonorants which are produced with continuous, non-turbulent airflow in the vocal tract. They are selected to be taught first as they are voiced and could easily and clearly demonstrate blending and segmentation as compared to other consonants such as <b>, <c>, <d>, etc.

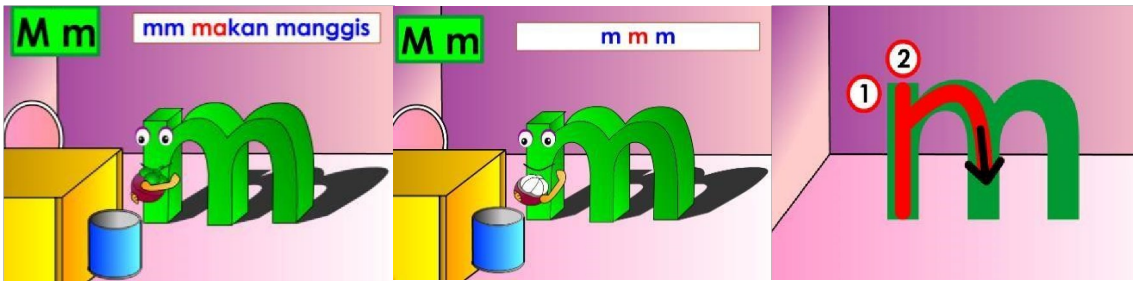

Figure 6 - Extracts of screens from animated song for letter name, sound and shape learning

After learning each consonant sound using animated songs (Ng, 2014), participants were introduced to the "*Plant and Grow*" animated game for learning blending and segmentation (B&S) skill. The word 'plant' in this software means merge sonorant letters (<s>, <l>, <m>,<n>, <r>) in the form of seeds brought by beautifully designed bees into the vase with 6 vowels (<a>, <i>, <o>, <u>, <e>, <é>). The word 'Grow' signifies a blending of consonants and vowels to form syllables CV. For example, <s> merges with <a> to form <sa>, without naming the letter. This visual and audio animation enables participants to "see" and "hear" the blending of phonemes and segmentation of syllables (Figure 7).

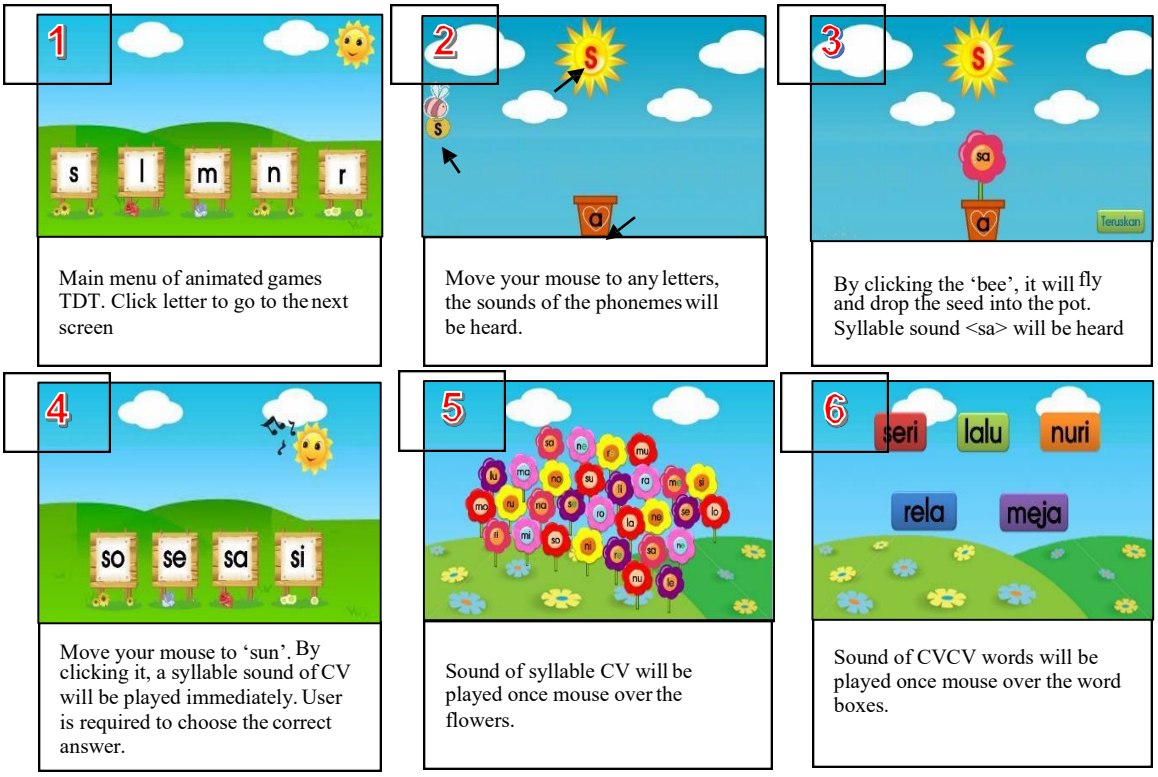

Figure 7 - Design of animated games TDT (Plant and Grow)

New syllable learnt are immediately practiced with phonological awareness skills, such as "sa", "*satu*" (one); "*sabun*" (soap), "*sapu*" (sweep), "*angsa*" (goose) and "*rusa*" (deer) to create awareness of the syllable sound. Similarly, automatic syllable reading is enhanced through reading and spelling after and before each intervention session. Word reading is introduced right after learning enough syllables to form words. These words are then learnt in context to provide meaningful learning (Figure 8).

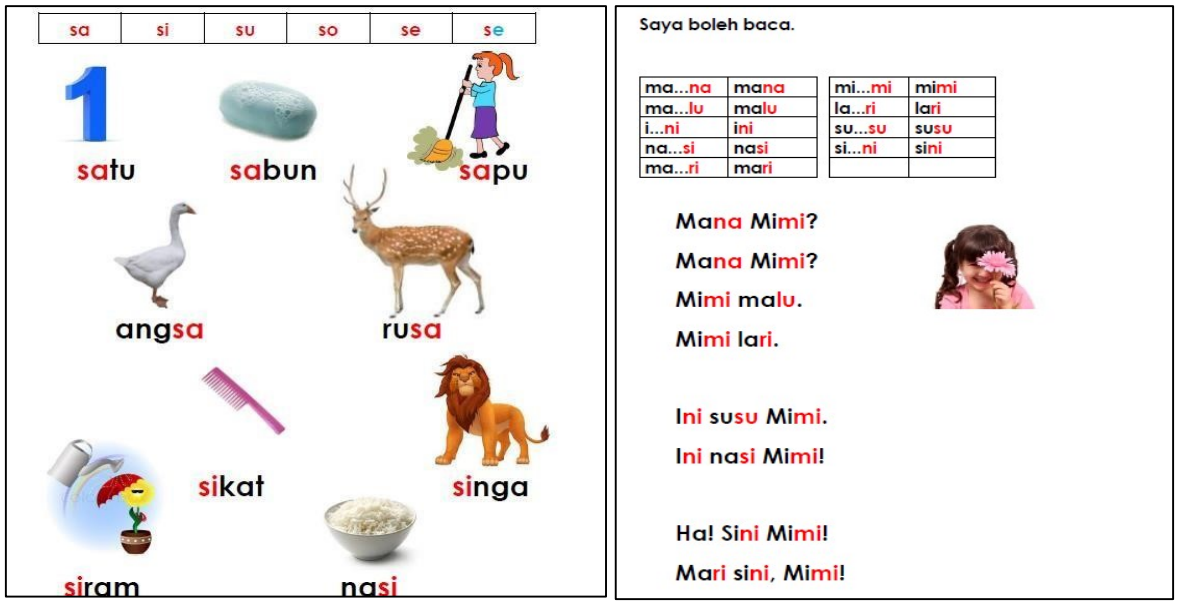

Figure 8 - Phonological awareness practice and word reading practice

The intervention lasted for 3 weeks, 5 days a week and 30 minutes per day. The intervention was conducted during the remedial sessions and the focus was to create phonological awareness, build the understanding of grapheme-phoneme correspondences, enhance blending and segmentation skills, increase automatic syllable and word reading and ultimately enable contextual reading. The sessions was planned but yet not strictly structured so that the intervention was conducted based on the learning pace of participants (see Figure 8 for a general guideline).

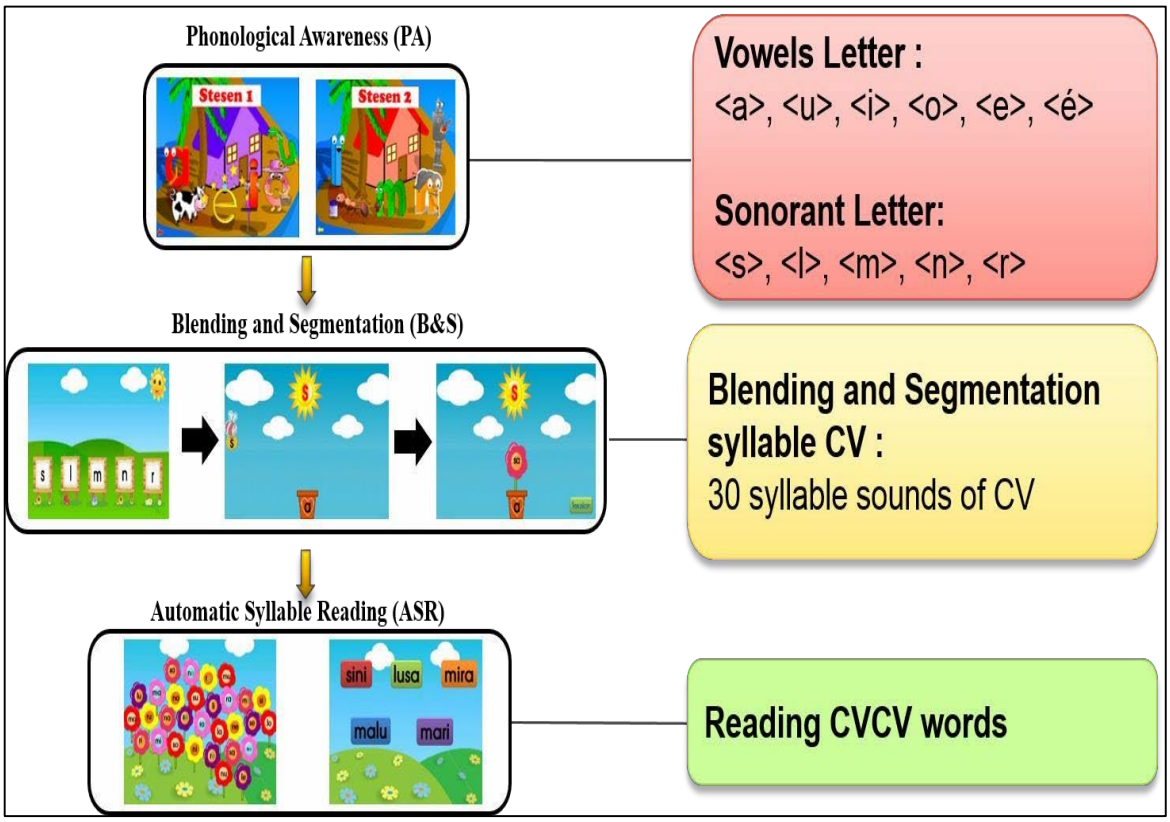

Figure 9 - Procedures of Intervention

Research Findings

Results from the Malay Literacy Test administered before and after the intervention were shown in Figure 10. Findings demonstrated that both participants A and B showed significant improvement in all four skills, namely phonological awareness (an increase of 70% and 80% respectively), grapheme-phoneme correspondences (40% and 56.7%), syllable reading (50.7% and 58.7%) and word reading (70 and 60%).

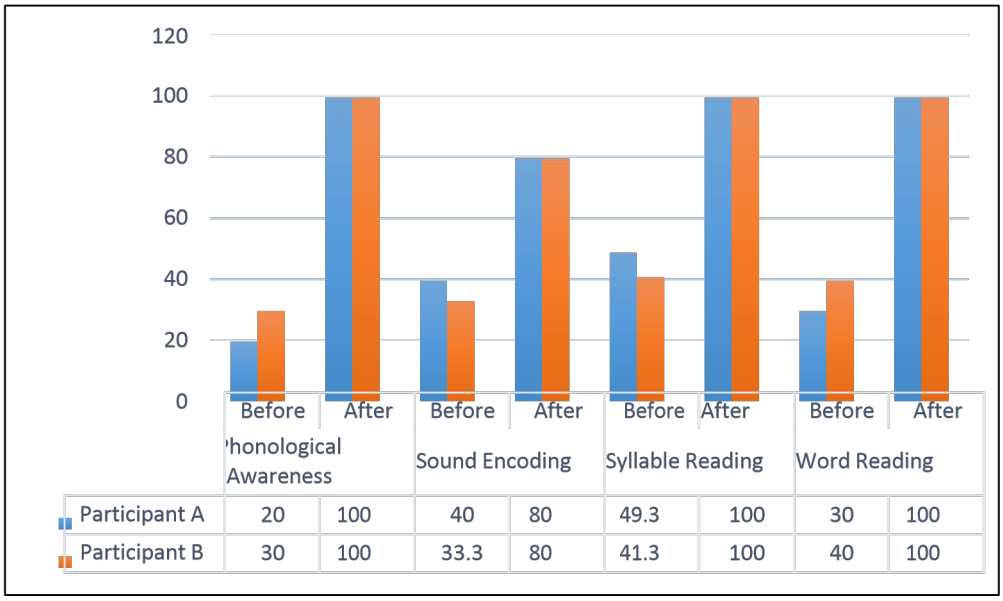

Figure 10 - Malay Literacy Test results of participant A and B before and after intervention

Research Reflection

The findings showed that both native-speaker remedial participants have gained some understanding of phonological and orthographic knowledge of the language in 3 week's intervention. At the beginning of the intervention, the participants tend to fall back to the old style of "spelling out each letter name before naming the syllable". It was in fact not easy to unlearn as old habits die hard. It took some time before the participants began to understand that graphemes represent spoken sounds and spoken sounds can be encoded using graphemes.

When they were guided to "seek for" similar sounds in their environment, for example, "*susu*" (milk), "*sudu*" (spoon), "*sungai*" (river), they began to develop phonological awareness which they had never learnt explicitly before. This realization made learning more interesting and exciting. The learning became more invigorating as they could relate to more and more similar sounds in the surrounding, especially things which were relevant to them such as their own names. They were amazed when they discovered that the similar sounds could be represented by the same letters. This pattern recognition accelerates learning as learning transfer occurs. This was evident as the learning speed picked up after the first blending task of consonant <s> with vowel sounds. Moreover, participants were more aware of the prints around them. In one occasion, one of the participants was observed to have read out the sign on the wall in the classroom correctly without spelling it out.

Learning to encode (spell) and decode (read) was daily activities before and after each intervention session to reinforce and achieve automatic reading and spelling skills. The continuous assessments served as warming up exercises as well as practice to awaken interest, support retention and provide feedback to the learning before moving on to the next steps. In addition, blending skills were enhanced through the "*plant and grow*" computer

games to stimulate their interest and provide multimodal learning (Sankey, Birch & Gardiner, 2010). Computer games managed to attract their interest in learning as the use of multimedia incorporate elements of visual, audio and movement (Chambers, Cheung, Madden, Slavin & Gifford, 2006). The intervention was carried out in a supportive and non-threatening emotional climate. The findings proved that emotional engagement is essential to get children involved in higher cognitive processes learning (Driscoll, 2005).

Conclusion

The results showed that the implementation of the 3-week action research successfully improved participants' phonological awareness, grapheme-phoneme correspondences and blending skills. These skills collectively brought about improvement in word reading, and most important reading speed which largely enhances reading comprehension. The approach used in the intervention catered to the special needs of remedial students and effectively made the learning more interesting and beneficial to these students. In fact, rather than marking the end of the short 3-week action research, this is the beginning of a journey towards literacy teaching for these students until they achieve the goal of reading to learn and reading for knowledge and enjoyment.

Reference

Chambers, B., Cheung, A., Madden, N.A., Slavin, R.E. & Gifford, G. (2006). "Achievement effects of embedded multimedia in a Success for All reading program". Journal of Educational Psychology. 98(1), 232-237.

Driscoll, M. (2005). Psychology of Learning for Instruction. (3rd ed.) New York: Allyn and Bacon.

Lee, L. W. & Wheldall, K. (2011). "Acquisition of Malay word recognition skills: Lessons from low-progress early readers". Dyslexia. 17(1): 19-37.

Meyer, J. (2000). "Using qualitative methods in health related action research". British Medical Journal, 320, 178-181.

McKernan, J. (1991). Curriculum Action Research. London: Kogan Page.

Munro, J. (2008). "The factors that influence the emergence of prose reading by at-risk readers: specific comprehending difficulties". Australian Journal of Dyslexia and other Learning Disabilities. 3: 36-48.

Ng, P.F. (2013). Evaluation of a brain-compatible literacy intervention to enhance literacy skills and motivation. Doctor Philosophy, University Teknologi Malaysia, Skudai.

Ng, P.F. (2014a). "Analisis ralat membaca dan mengeja murid prasekolah". Prosiding Konvensyen Kebangsaan Pendidikan Guru 2014. 352-361. Oktober, 2014, Port Dickson, Malaysia.

Ng, P.F. (2014b). "Animated songs to enhance phonological awareness and grapheme-phoneme correspondence of at risk kindergarten children". Paper presented at the Konvensyen Antarabangsa Jiwa Pendidik 2014, Johor Bahru, Malaysia, 11-13 August.

Ng, P.F. & Yeo, K. J. (2012). "Preschool teachers' beliefs and practices on early literacy instruction". Paper presented at the National Seminar of Malaysian Education Dean Council (MEDC) 2012, Johor Bahru, Malaysia, 7-9 October.

Ng, P. F. and Yeo, K. J. (2013). "Lexical properties and early literacy acquisition of kindergarten children in Malay orthography". Journal of Education and Practice. 4(12): 139-151.

Sankey, M., Birch, D. & Gardiner, M. (2010). "Engaging students through multimodal learning environments: the journey continues". In ASCILITE 2010: 27th Annual Conference of the Australiasian Society for Computers in Learning in Tertiary Education: Curriculum, Technology and Transformation for an unknown Future, 852-863, 5-8 Dec 2010, Sydney, Australia.

Shankweiler, D. & Lundquist, E. (1993). "On the relations between learning to spell and learning to read". Haskins Laboratories Status Report on Speech Research. SR-113, 135-144.

Sousa, D.A. (2011). How the Brain Learns to Read. Thousand Oaks, CA: Corwin Press.

Wanzek, J. and Vaughn, S. (2007). "Research-based implications from extensive early reading interventions". School Psychology Review. 36: 541–561.

Yeo, K. J. (2006). Effectiveness of Intervention on Reading Readiness among Kindergarten Children. Doctor Philosophy, Universiti Teknologi Malaysia, Skudai.