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PHONOLOGICAL GAME-BASED MODULE TO ENHANCE TAMIL SCHOOL LINUS PROGRAM

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Abstract---*This study evaluates the relationship between phonological game-based module to enhance reading skills among Tamil school Linus Program students. When one is considered a normal reader, he or she does not encounter much difficulty in reading and understanding texts. There are, however children who have problems with phoneme identification and thus do not read well and they also have difficulties in comprehending texts. These learners should be identified and be assisted with game module so that they can proceed with their learning lives. This study was guided by following objectives: to identify phonological game-based scores among the participants; to identify the significances of the phonological game-based module in classroom practices. A sample of respondents from standard one from two selected schools in Perak state was used in this study. Phonological awareness skills of these respondents were tested to find out the nature of their phonological awareness. The results indicated that the phonological game-based module has significant role in enhancing the participants' phonological awareness and reading skills. The findings of this study will benefit primary school teachers by sensitizing them on the importance of instructing learners on phonological awareness as it plays a major role in reading skills acquisition especially the importance of game's importance. Although It is expected that children in standard one in primary schools should have the minimum ability to read, some children find difficulties in doing so. There are no studies on Tamil phonological awareness and its impact on reading particularly with Tamil school standard one learner with reading disabilities have been conducted in Malaysia. Therefore, the present study endeavors to establish the nature of these learner's phonological awareness to ascertain if learners with reading disability also have deficits in phonological processing with the aid of the phonological game-based module.*

Keywords---*Phonology, Phonological awareness, Phoneme, Reading*

I. INTRODUCTION

Phonological awareness is important because it strongly supports our learning of how the words in our language are represented in print. Many studies have found that phonemic awareness among pre-readers is a powerful predictor of future success in reading and spelling; more powerful than IQ or mental age (Torgesen, 2002). The results o f a study done by Stahl and Marray (1994, as cited in Poskiparta, Niemi, & Snow, 2002) suggested that single phoneme isolation, the easiest of the skills, is crucial to reading. Nearly all children in their study who could not adequately perform this task had not achieved a pre-primer instructional level.

The importance of phonological awareness has been studied and proven to be important for skillful reading by such leading researchers as Torgesen & Mathes (2002) "It is now widely accepted that the primary cause of reading disability for

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a majority of children lies in phonological processing that interfere with the development of phonological skills, such as phoneme segmentation, verbal memory, and name retrieval" (Wechsler, 2007).

The relationship between phonological awareness and reading appears to be present even after accounting for variance due to factors such as IQ, vocabulary, memory and social class (Bryant et al., 2005).

II. LITERATURE REVIEW

First of all, phonemes are the very basic segment of speech "that speaks and listeners unconsciously combine and contrast to produce and perceive words in spoken language" (Roach, 2009). Then, to be phonemically aware requires explicit and reflective knowledge upon the linguistic units underline language (Moore & Schleppegnell, 2014). The third element of phonemic awareness involves the ability to blend, segment, and manipulate sounds in spoken words. Children who have acquired over the smallest units of speech are considered phonemically aware (Moore & Schleppegnell, 2014).

Phonemic awareness is not an all-or nothing trait which is either present or absent. Rather it entails distinctive levels ranging from primitive to more advanced ones which shows an understanding to the sound structure of language (Adams, 1990).

III. THE IMPORTANCE OF PHONEMIC AWARENESS

Phonemic awareness is vital for it helps children grasp and use the alphabetic principle to read and write (Aidinis & Nunes, 2001). In an alphabetic language English, speech sounds are encoded at the level of phonemes (Akers & Hardman, 2001) and by the letters of the alphabet in reading and writing. Mastering the alphabetic principle is an ability that there are systematic and predictable relationships between letters in printed words and sounds in spoken words (phonemes) requires an understanding that spoken words can be analyzed into their segments of phonemes. Children who are able to identify phonemes can consciously isolate individual sounds in words and associate them with the written letters of the alphabet whereas children without phonemic awareness may only memorize isolated letter-sound relationships by rote (Anthony & Lonigan, 2004).

IV. THE RELATION BETWEEN PHONEMIC AWARENESS AND PHONICS

Successful phonics instruction is based upon the development of phonemic awareness (Jalongo & Sobolak, 2011). To apply phonics skills requires the understanding of alphabetic principle. As described above, phonemic awareness helps children understand the principles underlying the alphabetic code (Johnson, 2013). Without phonemic awareness, phonics makes no sense and spelling is learning by rote (Amini, 2003) because children "do not understand what letter and spellings are supposed to represent" (Johnson, 2013). Children who lack phonemic awareness are unlikely to benefit fully from phonics instruction. Hence, phonemic awareness is considered a prerequisite to phonics.

V. THE LINUS PROGRAM IN MALAYSIA

In Malaysia, LINUS is the abbreviation of the Literacy and Numeracy Screening. The programme that was began in 2010 for students in Year 1, is one of the NKRA's agenda to access broadly for quality education. According to this programme, each student should master the basic skills after three years of his or her primary education that ends in 2012 (Zinitulniza, 2011).

LINUS programme formulation reflects the MOE's commitment to ensure the students master the literacy and numeracy skills (Education NKRA, 2012). In addition, parents, teachers and schools also benefit from the implementation of the LINUS programme.

One of the greatest challenges facing educators today is that of engaging a wide and diverse group of students. Games offer a medium for students to explore and interrogate information in a fun and interactive way. This type of animated learning environment is critical for engaging students in the learning given the prominence of iPods, game boys, play stations and a wide variety of highly entertaining and Sci-fi television in young people's lives today.

When we consider how infants and children learn we can appreciate the effectiveness of games as a learning tool. Children love to learn, they see it is as fun, a journey of exploration and excitement. Games play a huge part in that exciting journey, from learning how to count, how to interact with families and people, learning colours and shapes and much more.

Therefore, the aim of the present study was twofold. Firstly, the phonological game-based scores of the Linus Program participants was investigated. Secondly, the significance of phonological game-based module in reading among participants was evaluated.

VI. RESEARCH METHODOLOGY

DESIGN

The present study employed both qualitative (a descriptive approach) and basic quantitative design in investigating of the relationship between phonological game-based module with reading ability among Linus program students in Perak state. Hudson (2006) defines descriptive research as a method designed to investigate the current status and the nature of a given phenomenon. This means describing the characteristics of a particular group or individual. The present study focuses on standard one Linus program students.

A descriptive qualitative research approach designs was employed in this study to interpret the results because part of the data was non-numerical. This was in form of words and sounds the respondents produced which were analyzed as either being correctly read or those that contained mis-articulations. Whereas basic quantitative research design approach was used to interpret data in charts and percentages to compare the results.

THEORETICAL FRAMEWORK

Phonological awareness a processing ability mostly related to literacy. It encompasses phoneme awareness which is the ability to manipulate individual sounds (phonemes) in words, and rudimentary phonological skills, such as judging whether two words rhyme. It demonstrates that individual who have difficulty detecting or manipulating sounds in words will struggle with learning to read. Four decades of research has established this relation and it is evident in all alphabetic languages studied to date.

The phonological awareness theory (Anthony et al., 2005) is very relevant to this study in that it informs the study of importance of the learners having phonological processing abilities in order to be good readers. The theory also suggests the various tasks that can be used to detect if a child has developed phonological awareness skills.

In determining the nature of phonological awareness skills, the present study used the following tasks rhyme oddity, initial phoneme identity, final phoneme identity, phoneme blending, phoneme blending, phoneme deletion, phoneme segmentation, letter-name and letter-sound knowledge all which were informed from the tasks suggested in this theory. The development patterns of phonological awareness are also important for this study because at standard one, the participants were expected to have acquired adequate skills of phonological awareness. This is because the theory states that most of phonological awareness practices takes place at the pre-school and elementary levels. The distinctions of phonological awareness skills based on the unit of word structure of analysis are also vital. This is because the present study looked at the skills of the learners at the word level, the syllable level and the phoneme level. Such distinctions are vital in the analysis of the responses of the respondents in the present study.

PHONOLOGICAL GAME-BASED MODULE

Computer based phonological game module was developed and tested as a teaching tool to improve Linus program student's ability to read Tamil language. Standard one Tamil textbook was used as a guideline in designing phonological awareness tasks in line with as phonological awareness theory (Anthony et. Al., 2005) which are as 1) Rhyme and alliteration 2) Initial phoneme identity 3) Medial phoneme identity 4) Final phoneme identity 5) phonemic blending the module comprises of 5 units with 2 activities for each unit. Each activity was designed for 3 minutes of time duration.

VII. PROCEDURE

Data collection was carried out on July- October 2018. With the help of Linus program teacher, the phonological game module was administrated among the participants. The Linus program teacher required to set up the computer, open the program, and ensure each participant enters their name when prompted, to enable the recording of results into a database. From this point, the teacher is not required, providing the child has adequate computer literacy skills (e.g., can listen to the verbal instructions from the computer and can use a mouse to click their response).

The respondents were introduced to the list of sample vocabularies as follows:

āḻam (**ஆழம்**)	ilai (**இலை**)
āṭu (**ஆடு**)	pālam (**பாலம்**)
kaṭai(**கடை**)	paṭi (**படி**)
āṭai (**ஆடை**)	uṭai (**உடை**)
ambu (**அம்பு**)	ural (**உரல்**)
īrai (**இறை**)	īṭṭi (**ஈட்டி**)
ūr (**ஊர்**)	ēṭu (**ஏடு**)
ōṭu (**ஓடு**)	iṅku (**இங்கு**)
uppu (**உப்பு**)	īkai (**ஈகை**)
īram (**ஈரம்**)	aiṅtu (**ஐந்து**)
katti (**கட்டி**)	kiḻi (**கிளி**)
kuṇṟu (**குன்று**)	oṇṟu (**ஒன்று**)
aṟai (**அறை**)	kālai (**காலை**)
kuḻi(**குழி**)	kaṇṟu (**கன்று**)
kuṭṭi (**குட்டி**)	kāval (**காவல்**)
taṭi (**தடி**)	kācu (**காசு**)
kātu (**காது**)	uṇavu (**உணவு**)

Each task begins with two practice items followed by one test item. Each item is presented in a multiple-choice format. Research demonstrates that the optimal number of options per multiple-choice test item is three (Roach, 2009). Therefore, for rhyme and alliteration, initial phoneme identity, medial phoneme identity, final phoneme identity and phoneme blending, each test item consists of one correct option and two distractor options. One distractor item is phonetically similar to the correct option and the other distractor item is phonetically dissimilar. The response format for phoneme segmentation is

slightly different in that children click a box (i.e., up to four boxes) for each sound they hear in a spoken word. In the letter-name and letter-sound tasks, children are required to click the stated letter or sound from a choice of six letters. This is in keeping with probes by Gillon (2005).

The positioning of the correct option) e.g., as the first, second or third option) is varied from item-to-item to minimize the possibility of a correct response due to guessing behavior (e.g., by a child clicking a favored position). Each test item begins with simple verbal instructions in line with those used by Arrow (2007) and Gillon (2005), followed by the naming and presentation of each multiple-choice response options (i.e., once a response option is presented on the screen, it remains there until the child responds or until a 3 minutes timer runs out). Multiple-choice options are presented as static graphics (e.g., not animated) to ensure test items are engaging but not distracting.

The main character, 'Poe', and the words to be manipulated in the phoneme deletion and phoneme segmentation tasks involve animated images. The multiple-choice format enables items to be administered in a receptive manner, thereby reducing demands on working memory (Roach, 2009) and allowing for the use of a computer-based testing modality.

VIII. ANALYSIS AND INTERPRETATION DATA

Data analysis was facilitated through Statistical Package for Social Sciences (SPSS). Data was then coded according to the variables under investigation and the total score was calculated. Descriptive statistics used were to measures of central tendency (mean, median, and mode). Qualitative data was analyzed task based. In this method, each student score for each of the task was analyzed in order to get a total understanding of the score pattern. The post test scores were then compared with pre-test score results. Participants responses of phonological game-based module's effectiveness in learning to read in Tamil were summarized.

IX. RESULTS

PHONEME AWARENESS

Phoneme awareness was measure in 3 ways namely initial, medial and final phoneme identity. This section has 10 questions and both groups' total correct responses as follow;

Table 1. Respondents Responses of Phoneme Awareness Task

Group A	Correct responses	Group B	Correct responses
R1	10/10	S1	10/10
R2	9/10	S2	9/10
R3	10/10	S3	10/10
R4	10/10	S4	10/10
R5	10/10	S5	8/10
R6	10/10	S6	10/10
R7	10/10	S7	10/10
R8	10/10	S8	10/10
R9	9/10	S9	10/10
R10	10/10	S10	10/10
%	94%	%	97%

mean - 9.8 (group A); 9.7 (Group B)

MEDIAL PHONEME IDENTITY

In this section, the participants' medial phoneme awareness was measured. This section has 10 questions and both groups' total correct responses as follow;

Table 2. Respondents Responses of Medial Phoneme Identity

Group A	Correct responses	Group B	Correct responses
R1	10/10	S1	9/10
R2	10/10	S2	10/10
R3	10/10	S3	10/10
R4	9/10	S4	10/10
R5	10/10	S5	10/10
R6	10/10	S6	10/10
R7	10/10	S7	10/10
R8	10/10	S8	9/10
R9	10/10	S9	10/10
R10	10/10	S10	10/10
%	99%	%	98%

mean - 9.9 (group A); 9.8 (Group B)

FINAL PHONEME IDENTITY

In this section, the participants' final phoneme awareness was measured.

Table 3. Respondents Responses of Final Phoneme Identity

Group A	Correct responses	Group B	Correct responses
R1	10/10	S1	10/10
R2	10/10	S2	10/10
R3	10/10	S3	10/10
R4	9/10	S4	8/10
R5	10/10	S5	10/10
R6	10/10	S6	10/10
R7	8/10	S7	10/10
R8	10/10	S8	9/10
R9	10/10	S9	10/10
R10	10/10	S10	10/10
%	97%	%	97%

mean - 9.7 (group A); 9.7 (Group B)

X. DISCUSSION

PHONOLOGICAL AWARENESS

Both group A and group B participants were classified as students with poor reading skills. Therefore, their phonological awareness seems to be lacking. This is because, from the monthly test scores administrated by the school it is evident that these respondents were struggling to read and write due to poor phonological awareness. But, with the aid of game-based module it shows that the respondents' phonological awareness has increased. This is because all the students were scored high correct responses. Also, it is also notable during the assessment the participants self-confident in answering the task has rose. This clearly can be seen from both groups' task 1 responses. During the task 1, the participants were hesitated to play

the game and the teacher had to keep motivating them and hence the mean of task 1 is 9.4 respectively for group A and B. But, the participants were seems more confident in choosing the responses for task 2 onwards.

READING SKILLS

Based on the Linus program screening test (counted as pre and post-test of the study) which was administrated by the school teacher 10 students were selected from 2 schools. Pre and post test scores were compared to determine the achievement on reading skills among the respondents. It is evident that all the participants scored above the passing mark which was 40% after being introduced phonological game-based module. The highest pre-test score was 38% (group A) and 36% (group B). Whereas the highest post-test score was 52% (group A) and 56% (group B). On the other side, the lowest pre-test score was 20% (group A) and 19% (group B). Whereas the lowest post-test scores were 44% (group A) and 47% (group B).

PHONOLOGICAL AWARENESS INSTRUCTION THROUGH GAME BASED MODULE

The results showed that game based phonological instruction was deliberate and purposeful in enhancing reading skills among the participants. This is because computer assisted game module with sounds and animation was found supported literacy development, especially phonological awareness which is much needed to master reading skills among the participants. Furthermore, the results indicated that the participants comprehend better with the help of computer assisted game based phonological content compared to paper-based phonological module administrated by the teachers on daily basis.

XI. CONCLUSION

The phonological game-based module used in this study demonstrated that it could enhance the participants' phonological awareness and reading skills. The findings from this study suggests that the problems in early reading acquisition can be attributed to a result of poor phonological awareness and difficulties with understanding phonological awareness. The respondents were able to make significant gains in phonological awareness which resulted in enhancing reading skills when given direct, explicit and intensive instruction in phonological context. This is because participants' improvement in phonological skills led to increased reading ability.

In general, the results of this study replicate findings from a large body of national and international research on reading intervention showing that empirically validate instruction in phonological awareness and reading skills benefits struggling readers (ref). Recent research has suggested that game based phonological content considerably enhanced the participants' phonological awareness and reading skills.

XII. LIMITATION AND STUDY FORWARD

XIII. ACKNOWLEDGEMENT

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