

Phonology-based reading instruction to improve dyslexic students' early reading ability

Ranti Novianti^{1*}, Syihabuddin², and Endang Rochyadi³

¹Department of Special Education, Faculty of Teacher Training and Education, Universitas Islam Nusantara, Jl. Soekarno-Hatta No.530, Sekejati, Bandung, West Java, Indonesia

²Department of Indonesian Education and Literature, Faculty of Language and Arts, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudhi No. 229, Bandung, West Java, Indonesia

³Department of Special Education, School of Postgraduate Studies, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudhi No. 229, Bandung, West Java, Indonesia

ABSTRACT

Dyslexic students struggle to learn how to read. Yet, few studies reported on how dyslexic students learn to read. In this respect, special education teachers have adopted a myriad of ways to overcome reading problems of the dyslexic students. To respond to this need, the purpose of this study is to examine how phonology-based reading instruction could help dyslexic students improve their early reading abilities. Grounded in a mixed methods research design, four dyslexic students of primary school were recruited to participate in this study. The results of the study showed that phonology-based reading instruction had a positive impact on improving the dyslexic students' early reading abilities, particularly in Bahasa Indonesian-medium reading texts. This suggests that phonology-based reading instruction could effectively be implemented if special education teachers could enact phonological instruction as a prerequisite for identifying the students' early reading ability and phonics instruction as an instructional reinforcement for building students' early reading repertoire.

Keywords: Dyslexia; early reading; phonological awareness; special education

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INTRODUCTION

Reading is a complex process that involves physical and mental abilities to interpret the meaning of a text (Cain, Oakhill & Elbro, 2014). Learning to read also involves linguistic and cognitive capacities (Kamhi & Catts, 2002). For example, readers should have the ability to decode, recognize sight words, and to associate what is read with the knowledge they have (Mather & Wendling, 2012). These micro reading abilities are a prerequisite for both accuracy and fluency in reading so that learners can easily understand what has been read.

In the case of accuracy and fluency reading particularly in special education contexts, dyslexic children have difficulty in understanding letter symbols

in the appropriate sequence of sounds during the decoding process. They could not recognize words by sight. This hinders children from reading text accurately and fluently (Pennington, 2009). Dyslexic children hardly read words accurately; thereby, affecting fluency in reading and, in turn, reading comprehension (Moats, 2010). They also do not understand the relationship between oral language and written language as well as letter sounds and symbols (Goswami, 2010). For dyslexic children, processing phonological features of language is a driver of difficulty in identifying words which can help them understand alphabet systems. Inaccurate phonology representation contributes to the difficulty of obtaining letter mapping and decoding letters (Rose, 2009).

* Corresponding Author

Email: rantinovianti@student.upi.edu

Empirical reports show that dyslexic students could not easily receive appropriate and optimal interventions. So far, there has been little research investigating how dyslexic students learn to read (Mather & Wendling, 2012). Studies on ways of coping with dyslexic students in reading remain scarce, and there may be no single method that could accommodate the reading needs of dyslexic children (Wadlington, 2000). One of the ways to help dyslexic children read texts accurately and fluently is by building their phonological awareness. Some studies reveal that barriers to phonological awareness are often described as the cause of dyslexia (Berninger, Abbot, Nagy & Carlisle, 2010; Brady, 2011; Catts & Adlof, 2011; Snowling, 2011). Phonological awareness refers to the ability to understand and manipulate sounds which form words in spoken language. For most children, the development of phonological awareness occurs automatically as part of language learning. But for some other children, being aware of the sound of a particular language does not emerge naturally and causes a barrier to difficulty, especially for dyslexic children. Therefore, it is very important for dyslexic students to obtain specific instruction in raising their phonological awareness because it affects the development of their reading ability (Berninger & Wolf, 2010; Miller, Sanchez, & Hynd's, 2003). Thus, the relationship between phonological awareness and reading ability is reciprocal; the development of reading ability affects the development of phonological awareness and vice versa.

Phonological awareness, part of a linguistic area, has been found to be the basis for successful development of reading-related decoding abilities (Mather & Wendling, 2012). Soifer's (2015) study revealed that phonological awareness could be taught through structured learning. Hulme & Snowling (2011) study also suggests the same thing in that phonology-based interventions could improve the quality of decoding in reading. In the process of developing literacy, children gradually connect the phonological skills they have to the orthography/knowledge of letters as symbols of written language (Treiman & Bourassa, 2000). Over time, children usually begin to map larger phonological and autograph units as sound pronunciation combinations associated with letter combinations, and then decode the shape and arrangement of letters and its pronunciation in their memory (Ehri, 2000). As a result, this mental representation is appropriately and quickly accessed to build fluent reading.

Despite the role of phonological awareness on the development of reading skills among dyslexic children, very few studies have examined how phonological awareness can be trained and taught to dyslexic children in assisting their reading ability, especially in Bahasa Indonesia patterns. There may be little research on how reading instruction strategies for dyslexic children in which phonological aspects are taken into account. For this reason, a phonology-based reading

instruction strategy is examined to see whether such a strategy can improve dyslexic students' early reading ability and provide a solution to reading problems for students who have difficulty in learning to read. The scope of this study is limited to words or lexical items in Bahasa Indonesia.

METHOD

Research design and context

This research employed a mixed methods research design in the form of a multistage evaluation design, where quantitative and qualitative approaches were adopted (Guetterman, Fetters, & Creswell, 2015). This study aims to formulate a reading learning strategy for dyslexic students so that it is expected to improve the ability to read among beginner students through linguistic-based reading learning strategies designed conceptually and factually. This research is designed to produce contributions to scientific development in special education. The special education context in this study can be in the form of thinking, and understanding of the principles of linguistic-based reading learning to improve the reading ability of dyslexic students.

The nature of data in this study requires qualitative and quantitative data interpretation. Firstly, qualitative data analysis is focused on capturing the objective conditions of dyslexic students in general regarding their academic abilities, early reading, linguistic awareness and the process of learning to read. This analysis is made to produce findings of linguistic-based reading learning strategies validated by academic experts and practitioners.

Secondly, quantitative data analysis is needed to measure variables. The independent variable in this study is the linguistic-based reading learning strategy, and the dependent variable is the ability to read early on dyslexic students. Quantitative data processing is used to determine the effect of linguistic-based reading and learning strategies applied to students by looking at the impact of changes in students' initial reading skills before and after the intervention of reading to learn intervention.

The study was conducted at three inclusive schools located in Bandung. Each school has an average of 30 to 40 students per class, handled by 1 teacher. The school is provided by the government to support the students with a special need. This school consists of 5-10 %, all of whom are categorized as students with special need. This school collaborates with a foundation that focused on serving students with special need, especially in identifying students. This school was selected mainly because the identified dyslexic students have not been handled properly because of the teacher's lack of understanding of dyslexia. Thus, this study intervened in the current practice to help educate the dyslexic students in the school by assessing their needs, developing a concept, designing a testing strategy and developing a model strategy by doing multiple evaluations.

Participants

The participants of this study consist of four primary school students with special need (inclusive education) through a probability sampling strategy. To gain access to participants, researchers conducted licensing procedures for the school and parents. so that the research process can be done in school hours and at home. Before the experiment, the students were told about the research and its objectives. They all agreed to participate in the experiment. One student was in the second grade; two students were in the third grade, and one student was in the fourth grade. These four students were identified as having dyslexia based on the results of the DSM checklist instrument (Diagnostic and Statistical Manual for Mental Disorders) V and the IQ (Intelligence Quotient) test. They had similar reading difficulties; they only knew a few letters and could not even read syllables. The four students were placed in the same room and accompanied by four different teachers. The data were collected in the form of the students' early reading ability test result, process of

intervention, and early reading ability test result after the intervention.

Three teachers were also purposively recruited as participants. They had taught reading lessons to each student. The four recruited students were taught a phonology-based reading instruction strategy so as to improve their early reading ability.

Intervention : Phonology-based instruction

In the phonology-based reading instruction strategy stage, the first focus is to promote phonological awareness. The material taught refers to materials that will hone students' abilities in understanding and manipulating the sounds so that it can form words in spoken language. The material to be taught on phonological awareness is divided into three parts, namely (1) word awareness; (2) syllabic instruction; and (3) phonemic instruction. Word awareness includes several capabilities that will be taught and trained is in Table 1, and syllabic instruction includes several abilities that will be taught and trained is in Table 2. For phonemic instruction is shown in Table 3.

Table 1. Word Awareness instruction

Aspect	Aim	Material	Teaching Procedure
word segmenting (sentence)	to separate the sounds of a word in a sentence	1) <i>Ibu masak</i> (Mom cooks) 2) <i>Ibu masak ikan</i> (Mom cooks fish) 3) <i>Ibu masak ikan di dapur</i> (Mom cooks fish in the kitchen)	The teacher mentions one sentence by giving a pause to each sound of the said word and students are taught to count the number of sounds the word is heard in the sentence.
word blending (phrase)	to combine the sounds of words into new meanings	1) <i>Meja makan</i> (dining table) 2) <i>Sikat gigi</i> (toothbrush) 3) <i>Kursi roda</i> (wheelchair)	The teacher mentions the sounds of two words and students are taught to merge/ combine the two sounds into a new meaning.
word segmenting (phrase)	to separate the sound of words in phrases with new meanings	4) <i>Kaos kaki</i> (socks) 5) <i>Sapu tangan</i> (handkerchief)	Students are taught to count the number of words in the phrase mentioned earlier.
word deleting (phrase)	to eliminate one word in a phrase		The teacher mentions the phrase and removes one of the sounds of the word, then asks the student to show a picture that represents the sound of the remaining word.
word deleting (word)	to eliminate one syllable in a word so that it forms a new meaning	1) <i>Durian</i> (answer choice: <i>duri-dasi</i>) 2) <i>Bantal</i> (pillow) (answer choice: <i>ban-bis</i>) 3) <i>Jambu</i> (guava) (answer choice: <i>jam-jus</i>)	The teacher mentions the word and removes one of the syllabic sounds and then asks the student to show an image that represents the sound of the remaining word.

Tabel 2. Syllabic instruction

Aspect	Aim	Material	Teaching Procedure
syllable blending	to combine two sounds of syllables into a word	1) <i>a-pi</i> (fire) 2) <i>bu-ku</i> (book) 3) <i>le-ma-ri</i> (case)	The teacher mentions a number of syllables and students are taught to unite/merge the sound into a meaningful word.
syllable segmenting	to separate the sound of word into parts of the syllable	4) <i>ma-ta-ha-ri</i> (sun) 5) <i>ba-lon</i> (balloon) 6) <i>da-un</i> (leaf)	Students are taught to count the number of sounds they heard in the word spoken.
syllable deleting	to eliminate some syllables in a word	7) <i>pen-sil</i> (pencil) 8) <i>nya-wa</i> (life)	The teacher mentions the sound of a word then removes one of the syllables on the word and students are taught to mention the sound of the remaining syllables.
syllable substitution	to replace the sound of syllables to form new word meanings	1) <i>buku</i> (book) – <i>paku</i> (nail) – <i>duku</i> 2) <i>sapu</i> (broom) – <i>sapi</i> (cow) – <i>saku</i> (pocket) 3) <i>balok</i> (block) – <i>balon</i> (balloon) – <i>badut</i> (clown)	The teacher mentions the sound of a word then replaces one of the syllables in the word with the other syllables, and students are asked to mention the sound of the new word.

Table 3. Phonemic instruction

Aspect	Aim	Material	Teaching Procedure
Phonemic isolation	to separate one phoneme sound from a word	1) <i>i-kan</i> (fish) 2) <i>e-lang</i> (eagle) 3) <i>u-bi</i> (sweet potato) 4) <i>ap-i</i> (fire) 5) <i>cab-e</i> (chilli)	The teacher mentions one word, then students are asked to separate the vocal phonemes at the beginning or at the end of the word by mentioning the sound of the letters.
Phonemic blending	to combining separate phoneme sounds into one whole word	1) <i>u-b-i</i> (sweet potato) 2) <i>b-a-j-u</i> (clothes) 3) <i>p-e-r-a-h-u</i> (boat)	The teacher mentions several phonemes and students are taught to unite/merge the phoneme sound into meaningful word sounds.
Phonemic segmenting	to solve one word into several phonemes	4) <i>m-a-t-a-h-a-r-i</i> (sun) 5) <i>b-e-c-a-k</i> (rickshaw) 6) <i>b-u-a-h</i> (fruit)	After the first teaching above, students are then taught to count the number of phonemes heard in the word by segmenting the sound.
Phonemic deleting	to eliminate one phoneme in a word	7) <i>p-e-r-m-e-n</i> (candy) 8) <i>d-r-a-m-a</i> (drama)	The next stage, the teacher mentions the sound of the previous word in full, then the teacher repeats by mentioning the phonemes in the word, then the teacher removes one of the phonemes on the word and teaches the student what the remaining sounds are.
Phonemic addition	to add one phoneme to a word that forms a new sound but has no meaning		The next stage, the teacher mentions the sound of the previous word in full, then the teacher repeats by mentioning the phonemes in the word, then the teacher adds one phoneme to the word and teaches the student to say what the word sound has added to the sound of another phoneme.
Phonemic substitution	to change phonemes in words so that new words can be formed but have no meaning		The next stage, the teacher mentions the sound of the previous word in full then the teacher repeats by mentioning the phonemes in the word, then the teacher replaces one of the phonemes in the word and teaches the student to say what the sound of the phonemes has been replaced.

Data collection and analysis

Data was collected through phonological processing tests and reading tests. The test on phonological processing used the Clinical Assessment of phonological Processing Standard Indonesia (CAPP-SI), which has three subtests consisting of phonological awareness, phonological memory and rapid automatized naming (RAN). In phonological awareness, the test has six subtests, consisting of syllable blending, syllable awareness, syllable deletion, phoneme counting, phoneme deletion, and phoneme blending. This test aims to identify the precursors of phonological coding, which is one of the bases of decoding skill or fluent-print word recognition skills. In phonological memory, it has two subtests, consisting of number memory forward (verbal memory span) and number memory reversed (working memory). This test aims to identify the precursors from listening which is one of the abilities that are important for reading. While phonological naming or rapid naming only has one item. Children are asked to name 50 colors that are on a piece of paper as fast as possible. This test aims to identify the precursors of orthographic coding which is one of the bases of fluent-print word recognition skills (Pennington, 2009). While the test instrument used to determine students' initial reading ability is using a test instrument adapted and developed from Early Grade Reading Assessment (EGRA). Early Grade Reading Assessment Toolkit Second Edition includes listening comprehension, letter identification, non-word reading,

and oral reading fluency with comprehension (Dubeck & Gove, 2015).

The score data obtained were analyzed by using quantitative data analysis. The process of analyzing qualitative data in the first and second stages is done through data collection, data reduction, data display, and conclusion. While the quantitative data analysis in the third study was carried out by using the method of visual analysis through graphs with the aim of clearly obtaining the results of the intervention to more easily explain changes in the subject's ability efficiently and in detail. The graph form used is a line graph.

FINDINGS AND DISCUSSION

Based on the shreds of evidence, it can be concluded that phonological awareness mastery problems are closely related to reading ability, where if reading ability is low, phonological awareness ability is also low. This happens in line with several references which reveal that phonological awareness is a prerequisite in reading skills as the basis is sound as the main key to understanding the relationship with the writing symbol. Therefore, special intervention is needed on phonological awareness aspects before they are starting to learn to read.

Qualitative data

Based on the results of preliminary identification using Diagnostic and Statistical Manual of Mental Disorders

(DSM) V, the four children who were the subjects of this study were diagnosed as having dyslexia barriers. The first subject was grade 2 student, the second and third subjects were grade 3 students, and the fourth subject was grade 4 student.

Based on the results of interviews and observations, in general, the four research subjects had the same type of dyslexia, namely phonological dyslexia. This was obtained from observational data when the reading learning process was carried out, and it was seen that the four students had difficulty reading words due to difficulty understanding sounds and applying symbols of sound and surface dyslexia (can read words phonetically but have difficulty with irregular words and does not have a relationship between grapheme-phoneme). It is just the degree of severity, which is different between subjects one from another subject.

The analysis shows that the four subjects often experience exchange of letters that sound similar, for example, in sounding the letters / v / with / p /, / f / with / p /, / b / with / d /. In addition, the four subjects often add vowel sounds when reading consonants, for example in the case of adding / L / to / la /, / m / read / ma /, / y / read / yes /, / d / read / ba /, / g / read / ga /, / j / read / ja /, / r / read / ra /. In general, the four subjects have difficulty connecting sounds with symbols in writing and vice versa because the barriers they experienced are the impact of the ability to read syllables and words. Errors in reading, in general, include consistency in the pattern and the same letters in words that have a sequence of letters with similar shapes, the subjects tend to misread them. For example, the word "celana / pants" are read as "celaha" because the letters / n / and / h / are still often confusing to them. Another example is the word "foto / photo", which tends to be read as fo because the sequence / f / and / t / is similar as reversed.

Other errors happened to the word "balon / balloon", which was read "bola / ball", "donat / donut" read as "kodak", "sawah / rice field" read as "sewah", "jaket / jacket" read as "jakat", "sampah / garbage" read as "samah", "simpan / save" read as "sampan", "bersin / sneeze" read as "bersih / clean", "permen / candy" read as "emen", "drama" read "lama / old", "nyawa / life" read as "nyewa / rent". Based on data analysis, this errors occurred because the subjects guessed the words when looking at the word pattern globally, but the representation is partial, so the sequence of letters that are seen is not like the sound that should be mentioned.

Based on the results of interviews and observations, the teacher who became the homeroom teacher did not seem to have the knowledge, understanding, and skills in teaching reading to the students with dyslexia barriers and there is no proper handling of the teaching of reading for them in school. This can be seen from the conversation conducted by the teacher with the researcher. The teacher considered students who cannot read in their class were incapable

students and having difficulties learning like children in general. The teacher believed that the way to teach reading was the best. Like what the teacher said in the interview. "I used to teach reading like this for years and all the students I taught managed to be able to read, but only to these students because they were slow learners."

The learning to read approach that the teacher used as a synthetic approach (using the part to the whole approach). In this approach students learned to construct words in their entirety and depart from small parts, starting from memorizing all the names of letters, combining letters into syllables, reading all syllables from / ba / to / zo /, after that the students started reading the words, sentence and paragraph. The reading method taught by the teacher was by spelling, where students were asked to name each letter in the word and combine the sounds of each name of the letter into syllables, and then mentioned the sound of the syllables to form a word.

In terms of reading material, the teachers took it from textbooks used in school. The teachers did not pay attention to the selection of reading material, which is tailored to the students' abilities. The media used by teachers were textbooks and notebooks, very few teachers took the initiative to prepare media and learning materials specifically.

In fact, reading required rapid letter mapping into phonological representations, followed by combining these representations into whole words (Mather & Wendling, 2012). The most effective method in teaching reading is a method that can improve mastery of spelling-sound relations and increase understanding in the relationship between the sounds of speech and written symbols (Hulme & Snowling, 2011). In addition, the teacher's understanding of the structure of language and the process is very important as a teaching methodology that will be used to improve the reading ability of dyslexic children (Berninger, 2011; Berninger & Fayol, 2008).

Quantitative data

Improved ability of the subjects in reading is marked by an increase in the score of the phonological processing test and the results of the decoding test after the intervention/provision of phonology-based reading instruction, starting from baseline conditions 1 (A-1), the intervention (B), to baseline 2 (A-2). In general, scores obtained from all four subjects indicated improvements. The increase was seen significantly from the stage during the intervention. This can be seen from the increase from the initial baseline obtained by 20% increasing to 70% after the intervention.

Table 4 shows the results of the data acquisition of the four research subjects in measuring phonological awareness abilities, namely phonological processing and reading the baseline conditions at baseline-1 (A-1), intervention (B), and baseline-2 (A-2).

Table 4. The development of phonological processing ability and early reading subjects 1, 2, 3 and 4 (ABA Design)

Aspect	Baseline 1				Intervention												Baseline 4			
	1	2	3	4	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
1. Phon.	57	60	58	59	61	62	72	80	81	81	81	83	86	89	89	94	94	93	94	95
1. Read.	60	59	60	62	73	76	85	89	89	95	94	97	97	101	101	102	102	101	102	102
2. Phon.	61	59	59	61	64	62	73	73	73	80	80	80	88	88	88	93	93	94	94	95
2. Read.	50	50	45	50	59	59	72	72	77	79	78	82	87	90	95	97	97	97	97	98
3. Phon.	43	46	46	47	48	48	54	54	54	72	72	72	84	84	84	105	105	106	106	106
3. Read.	63	70	69	72	72	72	72	88	88	105	105	105	108	109	109	109	109	109	109	110
4. Phon.	62	64	63	66	66	62	62	66	66	70	70	70	85	85	86	93	100	100	98	100
4. Read.	55	57	60	56	56	58	58	67	67	71	71	77	77	85	90	97	97	96	97	98

S = Subject Phon = Phonology Read = Reading

In the development table of phonological processing abilities and early reading ability of the four research subjects, it can be seen that starting from baseline 1 (A-1), intervention (B), to baseline 2 (A-2). In general, the scores obtained by all subjects showed an improvement. The improvement can be said to be significant, starting from the intervention to the end of the intervention. This means that interventions carried out on the aspects of linguistic awareness, especially on phonological awareness, have a positive impact on changes in the abilities that the subjects have. Figure 1 to 4 shows the development of the ability of the four research subjects on the phonology aspect and their early reading ability.

From the four figures, there is an improvement of four research subjects on phonology skills and early reading ability. The increase is seen significantly from

the start of the intervention. Based on the overall data analysis, through the intervention provided in the form of phonology-based reading instruction strategy to the four research subjects, all four students with dyslexia turned out to indicate an effect on increasing the early reading ability. This is indicated by the increasing ability of students in the aspect of phonological awareness and early reading ability. The increase in students' ability was marked by an increase in the score of phonological processing tests and reading test results after the intervention/giving phonology-based reading instruction, as well as overlapping data on baseline conditions and intervention in all four subjects were not more than 90%, which means the influence of intervention can be believed.

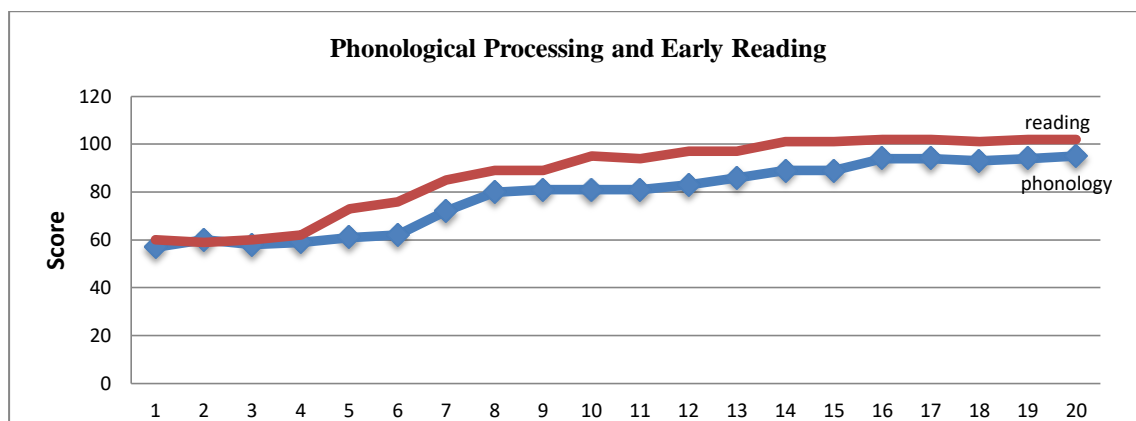


Figure 1. The development of phonological processing and early reading of subject 1 (desain a-b-a)

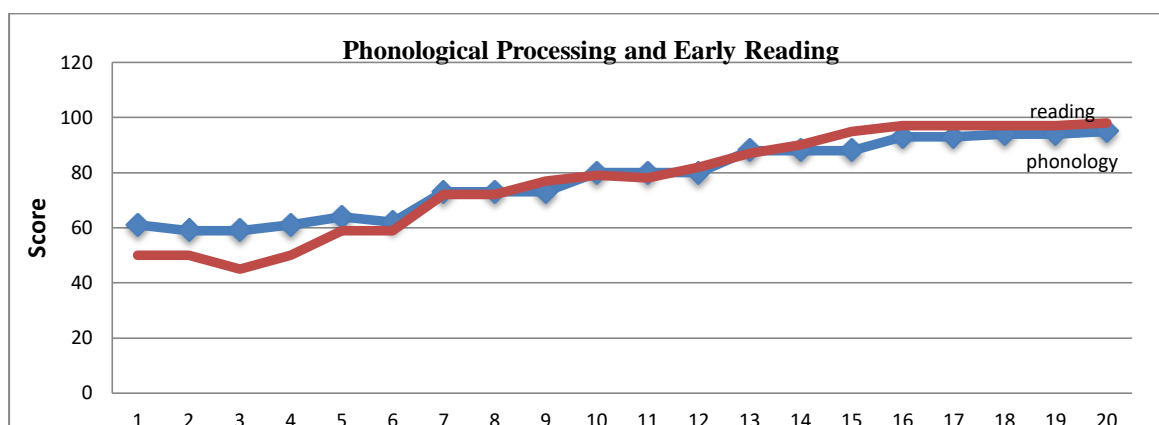


Figure 2. The development of Phonological Processing and Early Reading of Subject 2 (Desain A-B-A)

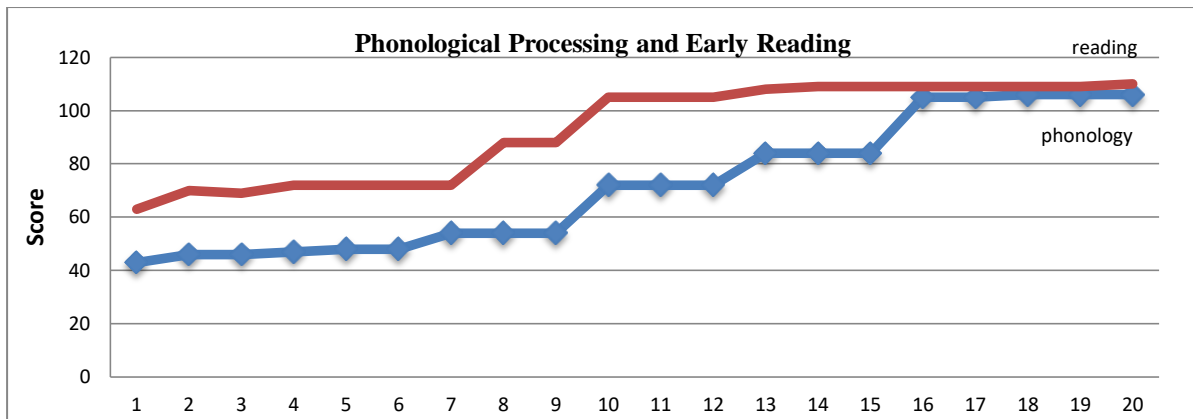


Figure 3. The development of Phonological Processing and Early Reading of Subject 3 (Desain A-B-A)

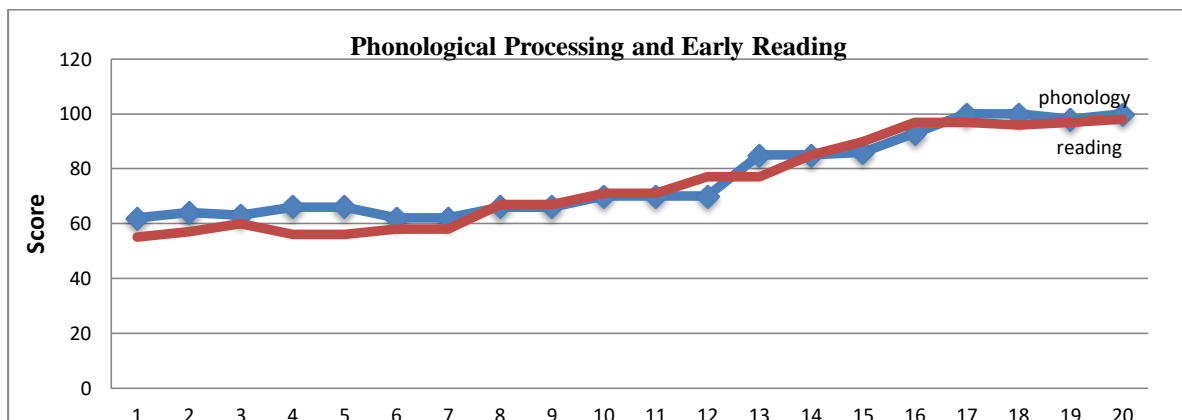


Figure 4. The development of Phonological Processing and Early Reading of Subject 4 (Desain A-B-A)

Based on the results of the study, phonology-based reading instruction strategy developed based on phonological awareness, has a positive impact on improving the ability to read early dyslexic students. These shreds of evidence are shown by the improving ability of research subjects in early reading, such as the ability to read words and sentences. Even far from that, after the implementation of this strategy, the subjects under study are able to read new words and sentences from the words and sentences taught by repositioning the sounds in the words or sentences he learned.

DISCUSSION

Based on the results of the study, the reading learning strategy based on linguistic awareness has a positive impact on improving the reading ability of the beginning of dyslexic students. These pieces of evidence are shown by the increasing ability of research subjects in reading such as the ability to read words and sentences. Even far from that, after the implementation of this strategy the subject under study was able to read new words and sentences from words and sentences taught by repositioning sounds on the words or sentences they learned. This is because in the process of learning to read, first build linguistic awareness through phonological instruction as the main requirement of reading skills. The series of reading lessons no longer only starts from recognizing letters, reading syllables,

words, sentences, and paragraphs. But beforehand, a phonological instruction was carried out which included word awareness, syllabic instruction, and phonemic instruction. It is very important for dyslexic students to get the teaching of phonological awareness because this teaching has an impact on reading skills (Berninger & Wolf, 2009). The relationship between phonological awareness and reading ability is reciprocal and two-way. As phonological awareness develops, the reading ability increases and vice versa (Miller et al., 2003).

Operationally the application of linguistic-based reading learning strategies for dyslexic students is taken in two stages. The first stage is phonological instruction as a prerequisite for learning to read and the second stage, phonic instruction, real reading learning. There are several principles in the application of the initial reading learning strategy for dyslexic students; the principles in question are; the reading learning process begins with building reading prerequisites, namely teaching phonological awareness. The next step, learning to read by using a synthetic approach with phonics methods. Another principle is related to establishing effective reading materials, namely reading material that will produce new words, sentences, and even paragraphs of the material being studied. Preparation of reading material is made based on the easiest word patterns to the most difficult word patterns. Reading material is arranged based on the selection of words that are easily understood and close to students.

Whereas in learning media, using the principle of Elkonin. Where media is used to help connect phonemes with grapheme by doing sound blending, segmenting, deleting, addition, substitution, and isolation through transferring these cards in front of students.

In addition, the preparation of material in phonological instruction is based on consideration in fulfilling the elements of blending, segmenting, deleting, addition, substitution, and sound isolation at the level of words, syllables and phonemes. All of these are the basics of the ability to manipulate sound as the basic ability to decode reading activities. The material made is arranged based on the easiest steps to the most difficult stages.

In phonics instruction, a reading learning approach used is a synthetic approach, part-to-whole approach. Students learn to build whole words from small parts through explicit instruction in changing letters into sounds and then mixing them so they can be arranged and formed into the sounds of the words spoken. This approach was chosen because it can strengthen visual and auditory associations through search. Breaking sounds into small parts makes it easy for dyslexic students to decode words with *multicastukata*.

While the method used to teach phoneme relations with grapheme is through phonic methods. The approach and method were chosen based on the consideration that dyslexic students generally read the word partially and had difficulty processing letters with a glance of sight (sight word reading) so that teaching reading greatly avoids the use of analytical approaches and global methods.

The preparation of reading material is made based on the easiest stages to get to the hardest stages, namely by arranging the easiest word patterns into the most difficult word patterns. Reading material is arranged based on the selection of words that are easily understood and close to students. The words and syllables chosen are also in accordance with the calculation of the highest frequency of occurrence; this is an assumption that the words and syllables taught are effective words and syllables. So that from a few syllables and the word being taught will produce many new words and sentences. While in the preparation of learning media, using the principle of Elkonin. The media used is very simple, namely using thick pieces of paper that are printed with letters, syllables, words and sentences from the material that has been compiled.

Only what is very important is the principle of the use of media which emphasizes blending, segmenting, deleting, addition, substitution, and isolation techniques through the transfer of these cards in front of students. Therefore, the use of media that has been designed has specific principles and rules on how to use it.

CONCLUSION

The success of the reading process is mainly influenced by good linguistic abilities, especially in phonology

aspects. This has implications for the reading learning strategy developed, that teaching about phonology is very important to do as an initial stage in teaching reading. Based on the results of this study, the reading process is not directly on reading, but there are conditions that must be mastered by students, namely phonology ability. If this is not understood, reading failure will probably occur.

There are several things that are lacking in this study due to the limited time available. So that results in limited research results only in answering the purpose of the research that has been made. One of them is that this study has just tested its effectiveness on a scale limited to four research subjects. The formulation of this linguistic-based reading learning strategy has not yet been explored extensively, so generalization cannot be taken. Therefore, this can be recommended to further researchers to be able to do a broad test and see the effectiveness of the reading learning strategy that has been formulated. Based on research findings and literature studies which have implications for the design of phonology-based reading learning strategies, the formulation of phonology-based reading learning strategies applied to dyslexic students consists of two stages of learning, namely the phonological instruction and phonics instruction. Phonological instruction aims to hone students' abilities in understanding and manipulating sounds which can form words in spoken language, while phonics instruction aims to teach reading skills, particularly the link between letters in the alphabet with the sound.

REFERENCES

- Berninger, V. W. (2011). Evidence-based differential diagnosis and treatment of reading disabilities with and without comorbidities in oral language, writing, and math: Prevention, problem-solving consultation, and specialized instruction. *Essentials of specific learning disability identification*, 203-232.
- Berninger, V., & Fayol, M. (2008). Why spelling is important and how to teach it effectively. *Encyclopedia of Language and Literacy Development* (pp. 1-13). London: Canadian Language and Literacy Research Network.
- Berninger, V. W., & Wolf, B. J. (2010). *Teaching students with dyslexia and dysgraphia: Lessons from teaching and science*. Baltimore, MD: Paul H. Brookes.
- Berninger, V. W., Abbott, R. D., Nagy, W., & Carlisle, J. (2010). Growth in phonological, orthographic, and morphological awareness in grades 1 to 6. *Journal of psycholinguistic research*, 39(2), 141-163. doi:10.1007/s10936-009-9130-6
- Brady, S. A. (2011). Efficacy of phonics teaching for reading outcomes. *Explaining individual differences in reading: Theory and evidence*, 69-96.
- Cain, K., Oakhill, J., & Elbro, C. (2014). *Understanding*

- and teaching reading comprehension: A handbook. New York: Routledge.
- Catts, H. W., & Adlof, S. (2011). Phonological and other language deficits associated with dyslexia. Individual differences in reading: *Theory and evidence*, 137-151.
- Dubeck, M. M., & Gove, A. (2015). The early grade reading assessment (EGRA): Its theoretical foundation, purpose, and limitations. *International Journal of Educational Development*, 40, 315-322. doi:10.1016/j.ijedudev.2014.11.004
- Ehri, L. C. (2000). Learning to read and learning to spell: Two sides of a coin. *Topics in Language Disorders*, 20(3), 19-36. doi:10.1097/00011363-200020030-00005.
- Goswami, U. (2010). Phonology, reading and reading difficulties. *Interdisciplinary perspectives on learning to read: Culture, cognition and pedagogy*, 103.
- Guetterman, T. C., Fetters, M. D., & Creswell, J. W. (2015). Integrating quantitative and qualitative results in health science mixed methods research through joint displays. *The Annals of Family Medicine*, 13(6), 554-561.
- Hulme, C., & Snowling, M. J. (2011). Children's reading comprehension difficulties: Nature, causes, and treatments. *Current Directions in Psychological Science*, 20(3), 139-142. doi:10.1370/afm.1865
- Kamhi, A. G., & Catts, H. W. (2002). The language basis of reading: Implications for classification and treatment of children with reading disabilities. Speaking, reading, and writing in children with language learning disabilities: *New paradigms in research and practice*, 45-72.
- Mather, N., & Wendling, J. B. (2012). *Essentials of Dyslexia Assessment and Intervention*. Canada: John Wiley & Sons, Inc., Hoboken, New Jersey.
- Miller, C. J., Sanchez, J., & Hynd, G. W. (2003). Neurological correlates of reading disabilities. In H. L. Swanson, K. R. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 242-255). New York, NY: Guilford Press.
- Moats, L. C. (2010). *Speech to print: Language essentials for teachers* (2nd ed.). Baltimore, MD: Paul H. Brookes.
- Pennington, B. F. (2009). *Diagnosing learning disorders: A neuropsychological framework* (2nd ed.). New York, NY: Guilford Press.
- Rose, J. (2009) *Identifying and Teaching Children and Young People with Dyslexia and Literacy Difficulties: An independent report*. Department for Children, Schools and Families, London.
- Snowling, M. J. (2011). Beyond Phonological Deficits Sources of Individual Differences in Reading Disability. Individual differences in reading: *Theory and evidence* (pp. 121-136). New York, NY: Psychology Press.
- Soifer, H. D. (2015). *State Building in Latin America*. Cambridge University Press.
- Treiman, R., & Bourassa, D. (2000). Children's written and oral spelling. *Applied Psycholinguistics*, 21(2), 183-204.
- Wadlington, E. (2000). Effective language arts instruction for students with dyslexia. *Preventing School Failure: Alternative Education for Children and Youth*, 44(2), 61-65. doi:10.1080/10459880009599785