

Important for Early Literacy Intervention Children with Dyslexia

Nurul Shofiah¹(⊠) and Zulmy Faqihuddin Putera²

¹ Universitas Islam Negeri Maulana Malik Ibrahim, Malang, Indonesia nurulshofiah@uin-malang.ac.id
² Politeknik Negeri Malang, Malang, Indonesia

Abstract. This study exposes initial screening, assessment diagnostics, monitoring progress for a child with dyslexia, and intervention for a child with dyslexia. This method used systematic literature review approaches (SLR). The database or dataset used for literature research is Google Scholar in Perish or Publish (PoP) application. Articles relevant to the research objectives. The findings showed a need for screening to determine the level of risk for reading problems in general and the potential risk of having or developing dyslexia. Furthermore, an assessment is needed to support educators in learning more about the student's learning profile so that teachers can plan targeted interventions. Once the diagnosis is determined, progress monitoring allows the teacher to quickly gauge students' responses to instruction. Data from monitoring a child's response to an intervention can provide important insight into whether a child can learn. Some key points of best practice for teaching should incorporate multiple approaches, such as alphabetic intervention and multisensory. All of these interventions are beneficial for the reading and writing abilities of people with dyslexia.

Keywords: Early Literacy · Intervention · Dyslexia

1 Introduction

Development Skills Reading is a multifaceted process that requires developing and integrating cognitive and language skills. Before children accepted formal reading instructions, many of these skills could be observed and measured. With data indicating that track reading is set earlier and stable [1, 2], it is critical to identify students who have difficulty reading early in their academic careers to inform their support. Especially true in children with dyslexia because early intervention is more effective than later intervention [3].

Dyslexia is a specific learning disability of neurobiological origin. It is characterized by difficulty with accurate and/or fluent word recognition and poor spelling and decoding skills [4, 5]. Difficulty research: dyslexia is one such study in which children have difficulty with activities such as reading and writing, which is not caused by a problem with sight but rather refers to the presence of disturbances in the nerves and brain's ability to cultivate and process moderate amounts of information [6]). Difficulty learning

dyslexia is usually detected after a child enters school [7]. Because nervous disorders cause it in the brain, a child with difficulty studying dyslexia has a level of average intelligence or even on average, which breaks the presumption that a child with difficulty studying dyslexia is a child who does not look clever [8].

Developmental dyslexia is the default since birth and is caused by genetic or inherited factors [9, 10] support the risk family as an indicator of dyslexia. Influencing factors in children's dyslexia experiences, including biological, cognitive, and behavioral factor supports the risk family as an indicator of dyslexia. Influencing factors in children's dyslexia experiences including biological, cognitive, and behavioral factors [11]. First, reading difficulty due to a biological factor-history. The family has a history of dyslexia, difficult pregnancies, and health issues [12]. Second, a cognitive factor is reason dyslexia, which is pattern articulation language and an individual's lack of phonological awareness. Third, factor behavior is a reason for dyslexia and is a problem in connection to social stress, which is an implication of difficulty study and motor disturbance. It strengthened, deep Frith's causal model framework [13], dyslexia could explore through three levels: biological, cognitive, and behavioral. The model also recognizes role environment and culture in interact with third level the. This model aims to investigate and explain the various perspectives on dyslexia and resolve the previously associated paradox with the definition of dyslexia. Frith's model proposes combining three levels of possible dyslexia's perceived paradox in its definition. Fritz stated, "To fully understand dyslexia, we need to connect the third rate and consider the impact of cultural factors that can exacerbate or repair the condition."

Dyslexia will cause problems in a person's life, whether or not it can be cured. *Dyslexia* is a chronic condition that is difficult to control or change [14]. Dyslexia can impact reading fluency and comprehension at the sentence or paragraph level [15]. Aside from the impact on reading skills and spelling and writing barriers, emotions and interests also impact reading, which leads to gaps in reading ability, vocabulary, and background knowledge. Children with dyslexia are often very worried about emotional, intellectual, social, and economic [16, 17]. With handling specifically, the barriers that they are experienced can be minimized.

Though there is no teacher assignment to diagnose dyslexia, teachers must accurately understand the difficulty underlying dyslexic behavior and cognition to identify or assess those at risk and intervene as needed [13]. In a nutshell, an evaluation could be used as a destination diagnostic to explain why a child is struggling to learn. Simultaneously, evaluation could be used as a predictive tool to obtain information that can assist teachers in predicting how children will resolve certain aspects of the curriculum [5]. The issue of how evaluation must be conducted is important. This is required to access various assessment strategies rather than just one type of evaluation or test. It does, though there is some testing for dyslexia. No, there is a single test for dyslexia.

Evaluation is critical for assisting with gift instructions and intervening early. Includes filtering at the start because we need to identify at-risk children more and introduce effective instructions at a time when we truly could optimize printing access. Consideration during the assessment process affects the results of children, families, and schools. The evaluation must provide information that can be easily associated with teaching programs or used to assist children in resolving curriculum more effectively. Every teacher should have the skill to fulfill the needs of individual students and respond to them correctly. However, teachers need more teacher training to meet these requirements. Students must also understand the severity of dyslexia. If teachers only considered dyslexia in terms of "reading, writing, and spelling," they would make stereotypical assumptions about students' expected performance. Because that study this aim exposes initial inspection, assessment diagnostics, monitoring progress for a child with dyslexia, as well as intervention for a child with dyslexia.

2 Method

This method uses a systematic literature review (SLR) approach. The object of this research is Children with disturbance Dyslexia. Dyslexia is an object of research for several reasons: *first*, developing strong reading skills is a basic academic ability needed for all learning in school and adult life. *Second*, dyslexia is a continuum disorder. Severity varies from mild to severe, and from trouble spelling to inability to read. *Third*, proper assessment recognizing early signs that a child may be at risk for dyslexia can help for give appropriate interventions and instructions and which they need (Table 1).

At the inclusion and exclusion criteria stage, the criteria are determined based on data that has been found. Appropriateness the data is selected for Becomes appropriate research data sources._ The following are data criteria that will be said to be worthy of being a research data source, namely, *First*, the provisions of the literature used consist of national and international journals using Indonesian and English with the year of publication 2015 to 2022. *Second*, the data used are only journal articles (review articles, research articles) and fully accessible research articles related to development. intervention read Child literacy with dyslexia.

Search Strategy	Criteria inclusion	Amount included articles
Scan Publish or perish (PoP) for use search terms	Written in Indonesian and English and published between 20 15 until 2012	"early literacy" or "emergent literacy" AND "d yslexia" found 995 articles
		"Dyslexia" AND "Intervention" totaling 955 articles
		" dyslexia" found 630 articles
Researching possible titles, abstracts and full text	Regarding Intervention Children with Dyslexia and the availability of full texts	75
Critical assessment of articles that are considered	quantitative research and qualitative research	15
important	systematic literature review	10
	'Suitable for discussion'	30

Table 1. Number of identified Articles Every Criteria

At the data collection stage, the keywords used were "early literacy" or "emergent literacy" AND "dyslexia". The database or dataset used for library research is the Google Scholar in Perish or Publish (PoP) application.

3 Result and Discussion

3.1 Early Examination for Children with Dyslexia

Inspection at the start allows teachers to quickly and easily identify at-risk students. Screening does not provide teachers with a complete understanding of the underlying causes of a problem, but it is a step in the right direction [18]. The goal of screening for dyslexia risk is very different from that of diagnosing dyslexia [19]. Determines the level of risk for reading problems in general and the potential risk of having or developing dyslexia. It is not appropriate to use screening results to diagnose whether someone has dyslexia formally. The National Institute of Health (NIH) has stated, "Dyslexia" can be identified with 92% accuracy at age 5.5 and recommends "early identification and assessment of disabilities in children" [20]. Petscher et al. [15] give two screening models for child dyslexia: consideration and examination neurology and judgment inspection behaviour (Table 2).

Petscher et al. [15] give two screening models for child dyslexia: consideration and examination neurology and judgment inspection behavior.

Consideration and Examination of Neurological Issues. Dyslexia develops due to an existing dysfunction that is influential and congenital to cognitive system components such as phonology and syntax. Where their component is specifically affected because there is more syndrome breadth, it usually involves the sensorimotor domain. Reading involves multiple cognitive processes. There are two of them: grapheme-phoneme mapping, which combines letters (graphemes) with sounds (sounds or phonemes) and produces words, and visualization in the form of recognition of familiar words to their mental representation. These two processes work together to allow us to say the words and gain access to their meaning, as well as other cognitive processes [21]. Study results

What Skills Are Selected?		
Phonemic awareness	The ability to hear, identify, move, or change the smalles sound units in spoken words.	
Phonological Awareness	Includes speech sounds, such as rhyme, alliteration, number of words	
Knowledge of Letters-Sounds	Sounds are represented by letters of the alphabet & letter combinations that make speech sounds	
Speed automatic	Ability to quickly name a familiar set of items, including letters, numbers, colors, & objects found in the classroom	

Table 2. Selected Skilss



Fig. 1. Basic screening assessment considerations (Petscher et al., 2019)

show the modifiable components of reading networks and how typical and atypical reading networks develop over time using the brain's structural magnetic resonance imaging (MRI) [22]. MRI studies have shown decreased gray matter volume indices and cortical thickness in children and adults with dyslexia compared to their peers [23].

Consideration and Examination Behavior. Identification for recognizing symptoms of behavior dyslexia needs to be conducted carefully to avoid wrong interpretation of the condition object behavior child could determine to follow proper procedures. Identification performed to recognize a child at school is basic, feature-oriented, or includes conditions, physical ability, intellectual ability, communication, and social-emotional development [24]. Next, Petscher et al. [15] share classification as follows.

Figure 1 depicts draft filtering behavior as a hierarchy. Began with a population of interest Students could evaluate, create, or choose a filter for service directly in the school environment if this is defined with good intentions. Development section population has identified, e.g. (i.e., children) as well as outcomes (i.e., dyslexia) that separate an individual from other identified results through specific indicators. Second, scope appraisal. Behavior dyslexia necessitates evaluation. Such as the alignment between the rationalized results and the operationalized filters, whether filters are speed-based, and whether single or multiple assessments should be combined. Issues of assessment scope, such as compatibility with service delivery requirements, filter localization, and administration frequency, have been discussed extensively elsewhere.

Third, reliability and validity. Each of these psychometric feature screeners is necessary but insufficient material in making, selecting, and using an I property screener. Validity. The most basic definition of reliability is the consistency of a set of scores for a measure. However, this definition may be very simplistic in a psychometric context because of the many ways it can be estimated. Various forms of reliability include internal consistency, alternative forms, test-retest, split-half, and inter-rater. Careful evaluation of the reliability of the filter scores is necessary because not all forms of reliability are created equal. Also referred to as parallel form reliability, screener technical reports often include alternative form reliability and is defined as the consistency of scores

Is the student at risk of dyslexia or not meeting important pre-reading and reading goals?	Validated interventions focusing on explicit and phonic-phonemic awareness should be provided to students at moderate to high risk for dyslexia.
Are students making sufficient reading progress to read proficiently and achieve important reading goals?	This assessment can help determine whether students at risk of dyslexia respond adequately to validated interventions and whether interventions should be modified or intensified.
Are students reading at a sufficient proficiency level to meet grade-level reading expectations and important reading goals ?	Summative or outcome assessments can determine whether students are proficient at reading and achieving important reading goals.
For students who are not making adequate reading progress despite the intense intervention, what another intervention approach has the best chance of increasing reading progress?	Diagnostic assessments can provide detailed information about students' reading skills to develop and implement individualized interventions for students.

Table 3. Four Basic Questions

(correlations) between two different versions of the same test. This form of reliability can be useful for characterizing the feasibility of using various forms across groups of individuals or within groups across different waves of data collection.

Fourth is the classification of students based on identification through reliability and validity. Classification is also necessary to utilize the size growth forecast on the screener. Fifth, taking decisions. Answer four basic questions (Table 3).

Type dyslexia is seen from levels [21]. *First*, dyslexia light is a condition that affects the pronunciation and pronouncing of words and sentences, with the results read at a low level. With assistance, a child with this condition may be able to adjust well. *Second*, a child with moderate or severe dyslexia will require encouragement and long-term support, which can be provided annually in school or by an expert in the field. *Third*, dyslexia is severe, which is a problem in reciting and pronouncing the arrangement of words and sentences with results of experiencing hardship, which could raise problems like performance less child in many or almost all eye lessons or another field. The severity of a child's absence can and should be mitigated with the help of a power expert or special for the deal in everything. Likewise, the guidance program can be customized at home. Even though all types and varieties of efforts have been made and given, the child frequently experiences dyslexia in activities carried out together and cannot be conducted efficiently.

Examples of validated and norm-referenced screening tests that are common for dyslexia include the Test of Phonological Awareness (TOPA), Comprehensive Test of Phonological Processing (CTOPP), Gray Oral Reading Tests (GORT), DIBELS, Dyslexia Screening Test (DST), and Wide Range Achievement Test (WRAT) [5]. While the Nevada Department of Education [25] describes the screening model for dyslexia as following (Table 4).

Required Components	Possible Screening Tool	
Phonological and phonemic awareness	DIBELS: First Voice Fluency (FSF) (K) DIBELS: Phoneme Segmentation Fluency (PSF) (K-1) AIMSWEB: Phoneme Segmentation Fluency (K-1) Abecedarian Reading Assessment: Phonological and Phonemic Awareness Phonological Awareness Skills Screen (PASS) (K-2 & students who have difficulty)	
Alphabet Knowledge	DIBELS: Letter Naming Fluency (LNF) (K-1) AIMSWEB: Letter Naming Fluency (LNF) (K-1) Abecedarian Reading Assessment: Letters Knowledge Lakeshore: Alphabet Knowledge Evaluation Reading AZ: Alphabet Naming Assessment	
Sound Symbol Recognition	DIBELS: Nonsense Fluency (NWF) AIMSWEB: Letter Voice Fluency TX College Station, Texas A&M: Fast Phonics Filter (K-6) Scholastics: CORE Phonics Survey (K-8) Houghton Mifflin: Phonics/Decoding Screening Test	
Decoding Skills	DIBELS: Nonsense Fluency (NWF) (K-2) DIBELS: Oral Reading Fluency (ORF) (1–6) AIMSWEB: Fluency in Nonsense (K-1) Abecedarian Reading Assessment: Decoding DIBELS: Oral reading fluency (ORF) (1–6) FCRR: Oral Reading Fluency Section (7–12)	
Quick Naming	Arkansas Rapid Naming Screener (AR-RAN) (K-2 by time) (3–12 by observed behavior)	
Encoding	Word Journey: Kindergarten Spelling Inventory (KIDS) (K) Words in their way: main spelling inventory (K-3) words in their way: basic spelling inventory (1–6) Words their way: top level spell inventory (elementary, junior high, high school, postsecondary) Gentry's Developmental Spelling Inventory (K-8) FCRR: Phonics Screening Inventory (intermediate, secondary, high school)	

 Table 4. Dyslexia Screening (Nevada's Dyslexia Resource Guide, 2015)

In early elementary grades (K-3), screening assessments should focus on developing some different basic skills required for skilled reading. K-3 grade screening includes phonological and phonemic awareness, speech symbol recognition, alphabet knowledge;

decoding skills; fast naming skills; and coding skills [25]. Furthermore, in grades 1–2, students should be screened on word reading accuracy, spelling skills, phonemic decoding efficiency skills, and sight word reading efficiency.

School institutions need to take action to improve services for students with dyslexia, starting with early screening efforts and preventive interventions. While universal screening for dyslexia risk has the potential to help many students with reading difficulties, it also poses risks and challenges for the school system and the students within it. Implementing an effective universal screening system to understand students' risk for reading disabilities, including dyslexia, is not a simple matter of selecting and administering one-time tests to select children. Instead, all students in all classes must be screened several times a year.

3.2 Evaluation Diagnostics for Children with Dyslexia

Evaluation diagnostics allow educators to investigate the student's profile study [18]. For many students, universal screening three times per year provide all necessary assessment data to ensure student make adequate progress. For at-risk students, however, analysis of subskills and careful reading is required for differentiated instruction and an intervention plan. Evaluation allows educators to ensure Skills or knowledge students have mastered and which knowledge is necessary. The diagnosis or identification of dyslexia requires a more comprehensive, time-consuming, and exponential evaluation procedure [15]. Evaluation read diagnostic allows teachers to differentiate instructions in class or plan targeted interventions.

RTI is indeed a method of diagnosis and treatment. However, the diagnosis of a disability is more studied than the medical condition (Response to Intervention as a Method for Dyslexia Remediation, nd). RTI refers to the process in which students are identified as unable to study based on response to instruction and support, which is provided on various intensity levels. If students 'respond' to support, add and close the gap with colleagues, they return to instructions regularly. Students who do not respond accept enhancement-level Support. Those who do not respond level of Support highest could be identified as an inability to learn [26].

Response to Intervention (RTI) is designed to ensure all students accept instructions based on effective research to Fulfill needs, that is, compatibility Among instructions, tasks, and skills enter students [1]. Framework RTI work combines prevention and intervention with sustainable evaluation in system whole school to identify the needs of instructional students and support appropriate learning, including instructions and assignments [25].

3.3 Monitoring Progress for Children with Dyslexia

With screening and diagnostic data, teachers can differentiate core instructions and give targeted interventions through Support intervention. Evaluation monitoring progress allows educators for with fast measure response student to instructions. Then waiting until the evaluation next monitoring progress allows adjustment of more instructions fast [27]. Monitoring data progress allows an outlook on profile study students. Studies

Intervention Model		Author (year)
Multisensory [29] Simultaneous Multisensory (Rismanto, 2020)	Glass Analysis method	Hasballah & Rabbi (2022)
	Fernald's method	Ukhti et al. (2022), Dibazar et al. (2022), Hanif et al. (2019)
	Davis Model	Yuzaidei et al. (2018)
	Method Hegge-Kirk-Kirk	Rababah (2020)
	the neurogical impress method (NIM)	Hidayati & Fahri (2021)
	Gillingham method	Bernadowski (2017), Sonday System, Barton, Fundations, Lexia Reading
Alphabet intervention	Mingle Model	
	Sight Word Training	McArthur et al., (2015)
	Phonic Training	Wang (2017)
		Doug and Lynn Fuchs

Table 5. Intervention Programs Methods Used To Help Dyslexic Children

show that data from the response child to intervention could give an important outlook on a child's inability to learn.

3.4 Intervention for Children with Dyslexia

Intervention is a method to change a person's behavior, thoughts, and feelings. So learning style is a way to change one's behavior, thoughts, and feelings by adjusting one's learning style. The interventions for handling dyslexia cases can be divided into two types: individual-oriented and school-oriented. Individually-oriented interventions aim to more fully identify the obstacles experienced in reading and train children's ability to focus on recognizing principles, pronouncing words correctly, and forming sentences correctly. While the interventions aimed at the school environment, the remediation program, and teacher assistance for children with dyslexia [28]. Many previous local intervention studies targeted improving reading difficulties rather than the cognitive skills of children with dyslexia.

There are several intervention programs available to improve dyslexia symptoms in children. The following are some of the methods used to help dyslexic children learn to read like (Table 5).

Those tables show one intervention for child dyslexia i.e. with use method multisensory. Multisensory it means enable whole sense sensory (senses catcher) in obtain impressions through tactile, visual, feeling, kinesthetic, and auditory [32]. With develop various ability observations that are owned by someone, the teacher gives stimulation through various modality sensors it has. Method multisensory covers activity tracing (touching), listening (auditory), writing (movement), and seeing [33, 34]. In implementation, fourth modality the must there to learn could running optimally. Method this use Theory reading which chosen of the words spoken by the child, and each word is taught by intact. There are several approach the as following:

Method Glass Analysis. Method Glass analysis is something method teaching through solving password group letter in a word [35]. Method this leave from underlying assumptions read as solving password or writing code. There are two underlying assumptions method this. First, the solving process password (decoding) and reading (reading) is different activities. Second, solving password get ahead read. Solving password defined as determine related sound with a written word by right. Read defined as lower meaning of written words. If child no could To do solving written password efficient so they no will study read. Through method Glass analysis, kid guided for know groups letter while look at words whole. Method this Emphasis on practice auditory and visual centered on the current word learned. Required materials for teach know groups letter could made by the teacher.

The Fernald Method. Method has develop something method teaching read often multisensory also known as VAKT method (Visual, auditory, kinesthetic, and tactile) [36, 37]. The Fernald Method effective for dyslexic children [38–40]. This Method use theory selected reading of the words spoken by the child, and each word is taught by whole and. Method this have four stage. Stages First, the teacher writes the word he wants studied above paper with crayons. Next child browse the posts with fingers (tactile and kinesthetic). At the moment tracing the writing, child see the writing (visual), and say it with hard (auditory). Process of sorts this repeated so that child could write the word with Correct without see example. If child has could write and read with That's right, material reading the saved. At stages second, child no too long to ask browse writings with finger, however study the teacher's writing with see the teacher writing, all the while say it. Children learn new words in stages third, with see the posts that with coping strategy theme difficulty study when your student is a Dyslexia is written on the board write or print, and say the word before write. At stages this child start read posts from book. At stage fourth, child capable remember the printed words or parts from the word that has learned.

Method Hegge -Kirk-Kirk. Hegge -Kirk-Kirk Method this developed by Hegge, Kirk and Kirk in 1972. Methods this take precedence for researching ability auditory student with Street blend sound letters, write combination sound letter be the last word say the word [41]. Next step is show the word to the student and tell student mention sound existing letters in the word. Next, students requested for write these words above paper. Rababah [42] say this method based on multiple senses in reading and repeated practice and practice and teaching connect each sound with the letter indicated by it, because it is based on the principles of phonemes, because of the sound and the good relationship between sounds. Indicative written symbols, in addition to tracking Pupils for letters word by letter.

Method Neurological Impress. Neurological impress is something designed method for help experienced individual difficulty read heavy [43]. The neurological impress method is a method that combines copy-paste of articulation, tone, and pronunciation of the teachers to the students [44]. In application, method this conducted with steps as

following.1) Teachers and students who have difficulty reading sitting opposite while read. 2) The teacher's voice is whispered to ear student. 3) Teachers and students refers to the sentence read by the teacher. 4) Deep condition particular, the teacher reads more fast or otherwise. Method this no require teachers to prepare ingredient reading by specifically and does not emphasize training pronunciation phoneme, word recognition, and content reading read. Destination main from method this is for get used to student read by automatic. For make it easy student follow this program, then the learning process started from low level from capabilities student. Few researchers in Indonesia are concerned about developing the reading ability of dyslexic students who use the neurological impression method, especially reading English text as a foreign language [43].

Gillingham Method. Orton-Gillingham (OG), a popular instructional training method, is often used with children with dyslexia. Developed by neurologists Dr. Samuel Orton and Anne Gillingham in the early 20 century, this method of teaching reading focuses on phonetics with a multisensory pedagogical approach, making it unique and different from other approaches [45]. Many studies explain that this method is effective for dyslexic children [46–49]. The Gillingham method is approach structured level which requires five hours of lessons During two year. Activity first directed at learning various sound letters and combinations letters. Child uses technique plagiarized for learn various letters. Beeps single letter next combined to in more groups large and then the phonics program resolved.

Alphabet Intervention. Alphabet's interventions include namely Mingle Model, Sight Word Training, and Phonic Training [6].

Method sight word training in alphabet intervention helps subject for could identify the letters that compose a word in frequent words found or used in reading so that subject could recognize word form and pronunciation it sounds with right. Child dyslexia with range 7–12 years old prove that Sight Word and Phonic Training are proven effective for could increase ability read child with difficulty study dyslexia, as in study [30].

Phonological Training. Wang [31] mention that *phonological training* proven by significant beneficial in help child with difficulty study dyslexia for could recognize character or form from something letter so that could with quickly and effectively spontaneous mention sound from a word with Correct without need spell it.

Mingle Model. The Mingle model is the game model with steps certain in Skills read and speak. The model made for student dyslexia Mercer, & Mercer (1979), Mingle model provides opportunity for develop Skills read for child dyslexia. T Teachers can assess students' reading abilities by defining letter vowels and consonants, syllables, words, and simple sentences, among other things. This model can introduce new ways of learning in which students study while playing with their friends, peers, and teachers. Condition this to be a fun situation for students when studying vowels and consonants and combining them with a tool like card letters. Students also study sound vowels and consonants to assimilate information into an existing scheme. Soon, they study combining vowels and consonants and producing them to create different voices and accommodate schemes [50].

4 Conclusion

The ability to read is the key to mastering all academic skills for students, i.e., students who understand the content of the text and develop new knowledge. Dyslexic students are those who have difficulty determining the spelling of words that have similar shapes. So to understand, they need screening to determine the level of risk for reading problems in general and the potential risk of having or developing dyslexia. Furthermore, an assessment is needed to support educators in learning more about the student's learning profile so that teachers can plan targeted interventions. Once the diagnosis is determined, progress monitoring allows the teacher to quickly gauge students' responses to instruction. Data from monitoring a child's response to an intervention can provide important insight into whether a child can learn.

An effective teaching methodology for dyslexic students also needs to consider the content of teaching as well as the teaching process. Some key points of best practice for teaching should incorporate multiple approaches, such as alphabetic intervention and multisensory. All of these interventions are beneficial for the reading and writing abilities of people with dyslexia. It is important to understand as much as possible about dyslexic students and keep assessing the available intervention strategies to see the long-term effects of dyslexia. Each intervention in the article reviewed was effective in targeting the targeted function.

The direction of the research can be to develop interventions and teacher competencies in understanding student dyslexia. Teacher competency development program for a student with dyslexia that can be through training or study sources, namely (1) selfprinted study materials; (2) online training; (3) online resources that can be used for independent study; (4) training by training; and (5) guidelines for parents who have dyslexic children as a form of parental control at home after receiving learning or intervention at school.

References

- H. W. Catts, D. C. Nielsen, M. S. Bridges, Y. S. Liu, and D. E. Bontempo, "Early Identification of Reading Disabilities Within an RTI Framework," *J. Learn. Disabil.*, vol. 48, no. 3, pp. 281– 297, May 2015, https://doi.org/10.1177/0022219413498115.
- K. L. Faraclas, "A professional development training model for improving co-teaching performance," *Int. J. Spec. Educ.*, vol. 33, no. 3, pp. 524–540, 2018.
- M. W. Lovett, J. C. Frijters, M. Wolf, K. A. Steinbach, R. A. Sevcik, and R. D. Morris, "Early intervention for children at risk for reading disabilities: The impact of grade at intervention and individual differences on intervention outcomes," *J. Educ. Psychol.*, vol. 109, no. 7, pp. 889–914, Oct. 2017, https://doi.org/10.1037/edu0000181.
- R. L. Peterson and B. F. Pennington, "Developmental dyslexia," Annu. Rev. Clin. Psychol., vol. 11, pp. 283–307, Mar. 2015, https://doi.org/10.1146/annurev-clinpsy-032814-112842.
- G. R. Lyon, S. E. Shaywitz, and B. A. Shaywitz, "A Definition of Dyslexia," *Ann. Dyslexia*, vol. 53, no. 1, pp. 1–14, 2003, https://doi.org/10.1007/s11881-003-0001-9.
- A. C. Ruby and W. Azizah, "Intervensi Alphabet Untuk Meningkatkan Kemampuan Menulis Dan Membaca Pada Siswa Dengan Kesulitan Belajar Disleksia," *Eksistensi*, vol. 4, no. 2, Sep. 2022, https://doi.org/10.29406/EKSIS.V4I2.4643.

- T. Raharjo, "Kesadaran Phonologi Dengan Literasi Membaca Pada Anak Disleksia: Kajian Meta Analisis," *J. Psikol. Perseptual*, vol. 2, no. 2, pp. 109–123, 2017, https://doi.org/10. 24176/perseptual.v2i2.2675.
- 8. N. Alkatiri and S. Satiningsih, "Self Accaptance pada remaja disleksia," *Character J. Penelit. Psikol.*, vol. 8, no. 1, 2021.
- 9. S. Q. A'yun and E. Latipah, "Upaya guru dalam identifikasi siswa disleksia," *KOLONI*, vol. 1, no. 2, pp. 469–477, Jun. 2022, https://doi.org/10.31004/KOLONI.V112.86.
- D. L. Molfese, V. J. Molfese, M. E. Barnes, C. G. Warren, and P. J. Molfese, "Familial predictors of dyslexia: Evidence from preschool children with and without familial dyslexia risk," in *The SAGE Handbook of Dyslexia*, G. Reid, A. Fawcett, F. Manis, and L. Siegel, Eds. London, Sage, 2008, pp. 99–120. https://doi.org/10.4135/9780857020987.n5.
- A. Nofitasari and N. Ernawati, "Teori dan metode pengajaran pada anak Dyslexia," in *Prosed*ing Seminar Nasional PGSD UPY dengan Tema Strategi Mengatasi Kesulitan Belajar ketika Murid Anda seorang Disleksia., 2014, pp. 172–181.
- M. Munawaroh and N. T. Anggrayni, "Mengenali tanda-tanda disleksia pada anak usia dini," *Proseding Semin. Nas. PGSD UPY*, pp. 167–171, 2016, Accessed: Nov. 06, 2022. [Online]. Available: http://repository.upy.ac.id/409/1/artikelmadinatul.pdf
- C. Knight, "What is dyslexia? An exploration of the relationship between teachers' understandings of dyslexia and their training experiences," *Dyslexia*, vol. 24, no. 3, pp. 207–219, Aug. 2018, https://doi.org/10.1002/dys.1593.
- S. Novita, Q. Uyun, E. Witruk, and J. R. Siregar, "Children with dyslexia in different cultures: Investigation of anxiety and coping strategies of children with dyslexia in Indonesia and Germany," *Ann. Dyslexia*, vol. 69, no. 2, pp. 204–218, Jul. 2019, https://doi.org/10.1007/s11 881-019-00179-5.
- 15. Y. Petscher *et al.*, "Screening for dyslexia," 2019. Accessed: Nov. 17, 2022. [Online]. Available: https://improvingliteracy.org/whitepaper/screening-dyslexia
- V. Johnston, "Dyslexia: What Reading Teachers Need to Know," *Read. Teach.*, vol. 73, no. 3, pp. 339–346, Nov. 2019, https://doi.org/10.1002/trtr.1830.
- E. M. Livingston, L. S. Siegel, and U. Ribary, "Developmental dyslexia: emotional impact and consequences," *Aust. J. Learn. Difficulties*, vol. 23, no. 2, pp. 107–135, Jul. 2018, https:// doi.org/10.1080/19404158.2018.1479975.
- U. Malcolm, "Evidence-Based Assessment in the Science of Reading LD@school," LD@School, 2022. https://www.ldatschool.ca/evidence-based-assessment-reading/ (accessed Nov. 06, 2022).
- P. Petchsawang and D. Duchon, "Workplace Spirituality, Meditation, and Work Performance," J. Manag. Spiritual. Relig., vol. 9, no. 2, pp. 189–208.
- "2017 Annual Report to Congress on the Individuals with Disabilities Education Act Individuals with Disabilities Education Act." https://sites.ed.gov/idea/2017-annual-report-to-con gress-on-the-individuals-with-disabilities-education-act/ (accessed Nov. 17, 2022).
- T. van M. J. Widyorini Endang, Disleksia Deteksi, Diagnosis, Penanganan di Sekolah dan di Rumah. 2019. Accessed: Nov. 15, 2022. [Online]. Available: https://books.google.com/ books?hl=en&lr=&id=hfpDDwAAQBAJ&oi=fnd&pg=PA98&dq=disleksia&ots=atswbi 2zTf&sig=JgYqihdB58iOGD4ocDyNm5Fm8TQ
- A. Martin, M. Kronbichler, and F. Richlan, "Dyslexic brain activation abnormalities in deep and shallow orthographies: A meta-analysis of 28 functional neuroimaging studies," *Hum. Brain Mapp.*, vol. 37, no. 7, pp. 2676–2699, Jul. 2016, https://doi.org/10.1002/hbm.23202.
- H. Lyytinen, J. Erskine, J. Hämäläinen, M. Torppa, and M. Ronimus, "Dyslexia—Early Identification and Prevention: Highlights from the Jyväskylä Longitudinal Study of Dyslexia," *Curr. Dev. Disord. Reports*, vol. 2, no. 4, pp. 330–338, Dec. 2015, https://doi.org/10.1007/ s40474-015-0067-1.

- 24. N. H. Rofiah, "Proses Identifikasi: Mengenal Anak Kesulitan Belajar Tipe Disleksia Bagi Guru Sekolah Dasar Inklusi," *Inklusi*, vol. 2, no. 1, p. 109, 2015, https://doi.org/10.14421/ijds.020110.
- 25. Nevada 's Dyslexia Resource Guide, no. September. Nevada Department of Education, 2015.
- E. A. Green, "Continuing the Debate: A Response to the Literacy Research Association's Dyslexia Research Report," *Int. J. Educ. Lit. Stud.*, vol. 10, no. 3, pp. 72–79, 2022, https:// doi.org/10.7575/aiac.ijels.v.10n.3p.72.
- A. Ekawijana, A. Bakhrun, and Z. Arsyad, "Deteksi Dini Anak Disleksia dengan metode Support Vector Machine," *J. Sist. Komput. dan Inform.*, vol. 4, no. 1, pp. 217–224, Sep. 2022, https://doi.org/10.30865/json.v4i1.4776.
- S. Umniyah, "Intervensi Anak Kebutuhan Khusus: Kasus Disleksia," UIN KalijagaYogyakarta, 2017.
- 29. J. R. Mills, "Effective Multi-Sensory Strategies for Students With Dyslexia," *Kappa Delta Pi Rec.*, vol. 54, no. 1, pp. 36–40, Jan. 2018, https://doi.org/10.1080/00228958.2018.1407181.
- G. McArthur *et al.*, "Sight Word and Phonics Training in Children With Dyslexia," J. Learn. Disabil., vol. 48, no. 4, pp. 391–407, Jul. 2015, https://doi.org/10.1177/0022219413504996.
- L. C. Wang, "Effects of phonological training on the reading and reading-related abilities of Hong Kong children with dyslexia," *Front. Psychol.*, vol. 8, no. OCT, Oct. 2017, https://doi. org/10.3389/fpsyg.2017.01904.
- A. Rismanto, "Kemampuan Membaca dan Menulis Siswa Disleksia Melalui Metode Simultaneous Multisensory Teaching," J. Lang. Learn. Res., vol. 3, no. 2, pp. 57–63, 2020, https:// doi.org/10.22236/JOLLAR.V3I2.7401.
- 33. D. Komalasari, Mahilda, "Metode multisensori untuk meningkatkan kemampuan membaca pada peserta didik disleksia di sekolah dasar.," *Proseding Semin. Nas. PGSD UPY dengan Tema Strateg. Mengatasi Kesulitan Belajar ketika Murid Anda seorang Disleksia.*, pp. 97– 110, 2016, Accessed: Nov. 15, 2022. [Online]. Available: http://repository.upy.ac.id/id/epr int/410
- Y. Van Donal, Armaini, and E. Efrina, "meningkatkan kemampuan membaca permulaan melalui metode visual, auditori, kinestetik, takstil (vakt) pada anak disleksia," *Ranah Res. J. Multidiscip. Res. Dev.*, vol. 2, no. 1, pp. 43–50, Oct. 2019, https://doi.org/10.1038/NATURE. 2014.14583.
- M. U. Hasballah and N. B. M. Rabi, "Meningkatkan kemampuan literasi dini pada anak disleksia melalui metode 'VAKTA," *J. Buah Hati*, vol. 9, no. 1, pp. 43–56, Feb. 2022, https:// doi.org/10.46244/BUAHHATI.V9I1.1735.
- A. Ukhti, S. I. Utami, and S. Budi, "Meningkatkan Kemampuan Mengenal Huruf Vokal Melalui Metode Fernald Pada Anak Disleksia," *Edumaspul J. Pendidik.*, vol. 6, no. 1, pp. 750– 754, Mar. 2022, https://doi.org/10.33487/EDUMASPUL.V611.3243.
- S. L. Hanif, A. H. Madjdi, and S. Utomo, "The Vakt Model Based on Psycholinguistic Review for Overcoming Dyslexia Children," 2019, https://doi.org/10.4108/eai.20-8-2019.2288133.
- M. Dibazar and A. Panahali, "Comparison of the effectiveness training of multisensory Fernald and Everton method on improving dyslexia in dyslexic students in elementary school," *Rooyesh-e- Ravanshenasi Journal(RRJ)*, vol. 9, no. 8, pp. 101–110, Oct. 2020, Accessed: Nov. 17, 2022. [Online]. Available: http://frooyesh.ir/article-1-2063-en.html
- E. Zamani Behbahani, P. Asgari, A. Heydari, and F. S. Marashian, "Comparison of the Effectiveness of Fernald's Multisensory Training and Computer Game Training on Dyslexia in Elementary Students with learning Disabilities," *Iran. J. Educ. Sociol.*, vol. 4, no. 1, pp. 58–67, Mar. 2021, https://doi.org/10.52547/IJES.4.1.58.
- 40. S. Vakili and N. Vaziri, "The effectiveness of Fernald's multidisciplinary teaching method on the increase the performance of reading components of dyslexic students," *Empower: Except. Child.*, Nov. 2021, https://doi.org/10.22034/CECIRANJ.2021.237273.1408.

- A. E. Wardana and L. H. Maula, "analisis implementasi pembelajaran bahasa indonesia pada anak dyslexia di kelas tinggi sd Al-Azhar 07 Kota Sukabumi," 2018.
- 42. A. A. Rababah, "The Effectiveness of an Intensive Reading Program According to the Response to Intervention and Evidence-Based Practices in Treating Dyslexia," *Int. J. Innov. Creat. Chang.* www.ijicc.net, vol. 14, no. 11, p. 2020, Accessed: Nov. 17, 2022. [Online]. Available: www.ijicc.net
- S. P. Hidayati and F. Fahri, "The Effect of Neurological Impress Method (N.I.M) on Reading Ability of English Text on Dyslexic Students," *Eduvest - J. Univers. Stud.*, vol. 1, no. 7, pp. 550–558, Jul. 2021, https://doi.org/10.36418/EDV.V117.102.
- C. Young, D. Pearce, J. Gomez, R. Christensen, B. Pletcher, and K. Fleming, "Read Two Impress and the Neurological Impress Method: Effects on elementary students' reading fluency, comprehension, and attitude," vol. 111, no. 6, pp. 657–665, Nov. 2017, https://doi.org/ 10.1080/00220671.2017.1393650.
- C. Bernadowski, "From Novice to Expert: The Perceived Self-Efficacy of Teachers Implementing Orton-Gillingham with Children with Dyslexia -- A Case Study.," J. English Lang. Teach., vol. 7, no. 2, pp. 51–58, 2017.
- M. Leeming, "A Short Monograph on How the Orton-Gillingham Method of Instruction Helps Children with Dyslexia to Learn to Read with Greater Fluency 100," *Lang. India*, vol. 15, no. 8, 2015, Accessed: Nov. 17, 2022. [Online]. Available: www.languageinindia.com
- J. J. Ring, K. J. Avrit, and J. L. Black, "Take Flight: the evolution of an Orton Gillinghambased curriculum," *Ann. Dyslexia*, vol. 67, no. 3, pp. 383–400, Oct. 2017, https://doi.org/10. 1007/S11881-017-0151-9/TABLES/3.
- A. Kakavand, N. Damercheli, and F. Shirmohamadi, "The comparison of the effectiveness of multisensory fernald and orton-gillingham methods in improving reading skill of dyslexic students," *J. Learn. Disabil.*, vol. 7, no. 1, pp. 100–118, Oct. 2017, https://doi.org/10.22098/ JLD.2017.579.
- 49. M. Fajar, "Penerapan Metode Gillingham Stillman dalam Mengatasi Kesulitan Membaca Anak Disleksia Siswa Kelas 1 MI NU Istiqlal Jati Kudus," 2020.
- I. Irdamurni, K. Kasiyati, Z. Zulmiyetri, and J. Taufan, "The Effect of Mingle Model to Improve Reading Skills for Students with Dyslexia in Primary School," *J. ICSAR*, vol. 2, no. 2, pp. 167–170, Jul. 2018, https://doi.org/10.17977/um005v2i22018p167.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (http://creativecommons.org/licenses/by-nc/4.0/), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

