

English Teaching Materials for Deaf and Hard of Hearing Students: Theory and Research

Miranti Eka Putri^{1*}, M. Zaim¹, Yasnur Asri¹, Sri Wahyuni^{2*}

¹ Language and Art Faculty, Padang State University, West Sumatra, Indonesia

² Education Faculty, Riau Islamic University, Riau, Indonesia

*Corresponding Author: mirantiekaputri@student.unp.ac.id, wahyunis@edu.uir.ac.id

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Abstract: *This study aims to examine theoretical studies and previous studies related to English teaching materials for deaf and hard of hearing students: theory and research. This research is a literature study by examining previous studies and theoretical studies. The results of the literature study will be used to identify the English language needs of special school for deaf students (SMALB-B) as preliminary study. The results of this study are the English teaching materials for deaf and hard of hearing students' needs.*

Keywords: English Teaching Materials, Deaf and Hard of Hearing

1. Introduction

Early literacy intervention in children with hearing impairments has a positive impact on learning to read in elementary schools, creating academic achievement and success in the future (Putri et al, 2020 & Putri et al, 2021). The National Literacy Panel (2008) recommends early intervention in literacy in two basic skills, namely code-based skills required for decoding words (phonological awareness, alphabetic knowledge, and print concepts) as well as meaning-based skills needed to understand the decoded words and thus ideas (vocabulary and language comprehension). Code-based skills and meaning-based skills are basic abilities in the formation of early literacy in children with hearing impairments (Gough & Tunmer, 1977; Holmer, Heimann, & Rudner, 2017; Lederberg, Miller, Easterbrooks, & Connor, 2014; Marschark et al., 2018; C. Mayer & Trezek, 2018; Webb, Lederberg, Branum-martin, & Connor, 2015). Reading is a complex process that is very important in learning English (Brown & Brewer, 1996). This process includes the active construction of meaning in text (cognition), linguistic knowledge, decoding of letters and words, and metacognitive. (Banner & Wang, 2013). Metacognitive strategy theory is the basis for implementing reading skills in students with four components, knowing when you comprehend, knowing what you comprehend, knowing what knowledge you need to acquire in order to comprehend, and knowing how to involve strategies to improve comprehension. Flavell (1981); Brown & Brewer (1996) describes the differences in each component, metacognitive knowledge, metacognitive experiences, goals or tasks, and actions or strategies.

2. Literature Review

Two parts explained in literature review, namely theoretical review and previous research. Each part contained sub part that consist of each theoretical review and previous research.

2.1 Theoretical Review

a. English Subjects for the Deaf and Hard of Hearing (D/HH)

Table 1: Theory of English Subject for D/HH

Review Type	Citation	Description
Theory-Gagne's Conditions of Learning	Gagne (1965)	The conditions of learning and the implications of instructional design. Types of learning outcomes, each of which is best achieved through its specific instructional design but also a set of steps required in each learning environment
Theory-Howard Gardner's Multiple Intelligences	Gardner (1983)	Many types of human intelligence result in different information processes.
Theory-The Peter Principle	Peter & Hull (1970)	Someone who is competent will get a position that requires different skills, meaning that one's educational competence will have an impact on the position at the next level of education
Principle Learning	Jerome Bruner (1961)	The need to create an educational learning environment that focuses on the uniqueness of students, how students become like that, and how students can become more valuable.
Theory-Skinner's Behaviourist Theory	Skinner (1936)	The importance of the role of the environment in influencing behavior, by almost eliminating innate or inherited factors to focus on learning
Theory-Maslow's Hierarchy of Needs	Maslow (1943)	Students who are motivated to achieve learning needs to take precedence over others if they feel comfortable.
Theory-Erikson's eight Stages of Psychosocial Development	Erikson (1958)	agree that the ego makes a positive contribution to development by mastering attitudes, ideas, and skills at every stage of development
Theory-Bloom's Domains of Learning	Bloom (1956)	The Cognitive Domain (Bloom's Taxonomy), The Affective Domain, The Psychomotor Domain, which reveals that the taxonomy of behavior is considered the goal of the learning process, means that students must acquire skills, knowledge, and / or new attitudes from each lesson.
Theory-Rogers' Humanist	Rogers (1959)	Students can achieve their goals, desires, and desires in life if they actualize themselves to reach their potential. Two concepts of cognitive processing and psychology, namely the first concept of chunking and short-term (working) memory capacity, are the basic elements of all subsequent memory theory. Furthermore, the second concept is about information processing, using computers as a student learning model.

Table 1 shows that the theory of English subject for D/HH on English teaching materials for deaf and hard of hearing students are theory-Gagne's conditions of learning, theory-Howard Gardner's multiple intelligences, theory-the peter principle, principle learning, theory-skinner's behaviourist theory , theory-Maslow's hierarchy of needs, theory-Erikson's eight stages of psychosocial development, theory-bloom's domains of learning, and theory-rogers' humanist.

b. English Teaching Materials for the Deaf and Hard of Hearing (D/HH)

Table 2: Theory of English Teaching Materials for D/HH

Review Type	Citation	Description
Theory-Cognitive Development	Piaget (1936)	Piaget's Stages of Cognitive Development discusses how students acquire, retain, and develop knowledge to improve student education. Studying the development of knowledge at each age level including deaf students at SMALB. Piaget believed that students reach different stages in cognitive development, increase knowledge, develop knowledge, and adapt previously held ideas to accommodate new information
Theory- Learning	Vygotsky (1978)	the context and content of the learning process facilitate teachers in selecting and considering learning tools for success in learning English
Theory-Howard Gardner's Multiple Intelligences	Gardner (1983)	Teachers in providing students with means of accessing content to enhance learning, demonstrating students 'knowledge and skills to increase learning engagement, as well as instruction with detailed knowledge of students' specific strengths and needs
Theory-Laird's Sensory	Laird (1985)	Greater learning can occur when the five senses of sight, hearing, touch, smell, and taste are stimulated. So that the adjustment of learning tools will need to be maximized in learning
Theory-Maslow's Hierarchy of Needs	Maslow (1943)	the learning approach includes the complete physical, emotional, social and intellectual qualities of the individual and how they affect the learning carried out
Theory-Bloom's Domains of Learning	Bloom (1956)	The Cognitive Domain (Bloom's Taxonomy), The Affective Domain, and The Psychomotor Domain becomes a taxonomy as the goal of the learning process so that students must acquire new skills, knowledge, and / or attitudes from each lesson.
Theory-Rogers' Humanist	Rogers (1959)	supports students to find an environment that provides authenticity (openness and self-disclosure), acceptance (being seen with unconditional positive regard), and empathy (being listened to and understood)
Theory-Cognitive of Multimedia Learning	Mayer (2005)	supports students to learn more deeply from words and pictures rather than just words. The use of words and images for learning media must also pay attention to their effect on the students cognitive.
Theory-Information Processing	Miller (1956)	two concepts of cognitive processing and psychology, namely the first concept of chunking and short-term memory capacity (work) are the basic elements of all subsequent memory theories. Furthermore, the second concept is about information processing, using computers as a student learning model.

Table 2 shows that the theory of English teaching materials for D / HH on English teaching materials for deaf and hard of hearing students are theory-cognitive development, theory-learning, theory-Howard Gardner's multiple intelligences, theory-laird's sensory, theory-

Maslow's hierarchy of needs, theory-bloom's domains of learning, theory-rogers' humanist, theory-cognitive of multimedia learning, and theory-information processing.

c. English Reading Skills for the Deaf and Hard of Hearing (D/HH)

Table 3: Theory of English Reading for D/HH

Review Type	Citation	Description
Theory- Learning	Vygotsky (1978)	The Zone of Proximal Development (ZPD) is a metamorphosis domain or space for students to achieve higher levels of knowledge and performance with support and adults or other knowledgeable people for example supporting cultures such as reading and writing
Theory-Laird's Sensory	Laird (1985)	the adjustment of approaches and resources to as many senses as students need in learning.
Theory-Erikson's 8 Stages of Psychosocial Development	Erikson (1958)	Students are motivated by the need to achieve competence in certain fields. So that it requires the ability of teachers to be able to motivate and explore the potential of students in learning
Theory-Rogers' Humanist	Rogers (1959)	Students can achieve their goals, desires, and desires in life if they actualize themselves to achieve their potential
Theory-Howard Gardner's Multiple Intelligences	Gardner (1983)	Learning styles include the visual, auditory, kinaesthetic, impulsive and reflective, right brain and left brain. So, it is expected that the teacher can clarify the intelligence of students and direct the learning style that is tailored to the wishes of each student
Theory-Skinner's Behaviourist	Skinner (1936)	The role of environmental factors in influencing behavior, with almost the exclusion of inherited or inherited factors
Theory-Bloom's Domains of Learning	Bloom (1956)	The taxonomy of behavior is considered the goal of the learning process, meaning that students must acquire skills, knowledge, and / or new attitudes from each learning.
Theory-The Peter Principle	Peter & Hull (1970)	Someone who is competent in his job will get promotion to a position that requires different skills. The Promotion will reach a level where they are so incompetent that they are stuck in the "Final Placement" or "Peter's Plateau", so this cannot be avoided
Theory-Canter's Theory of Assertive Discipline	Lee & Canter (1976)	Outlines clear expectations and positive and negative consequences, defines clear rules and boundaries, enables teachers to be assertive positively and uses common sense and approach to learning.

Table 3 shows that the theory of English reading skills for D/HH on English teaching materials for deaf and hard of hearing students are theory- learning, theory-laird's sensory, theory-Erikson's 8 stages of psychosocial development, theory-rogers' humanist, theory -Howard Gardner's multiple intelligences, theory-skinner's behaviourist, theory-bloom's domains of learning, theory-the peter principle, and theory-canter's theory of assertive discipline

d. English Reading Based on Local Wisdom for the Deaf and Hard of Hearing (D/HH)

Table 4: Theory of English Reading Based on Local Wisdom for D/HH

Review Type	Citation	Description
Theory- Cognitive Development	Piaget (1936)	Piaget's Stages of Cognitive Development, Piaget believes that students reach different stages of cognitive development through trial and error, students take an active role in the learning process, interact with the world around them, add new knowledge, develop existing knowledge, and adapt previously held Ideas to accommodate new information
Theory- Learning	Vygotsky (1978)	The sociocultural context that surrounds students which facilitate the learning process. This approach will take into account teachers in selecting and considering and discussing the language, cultural diversity of students, languages and literacy needed to be successful in learning English and academic content in schools and their peers
Theory-Howard Gardner's Multiple Intelligences	Gardner (1983)	Teachers provide students with ways to access content to enhance learning, show students 'knowledge and skills to increase learning engagement, as well as instruction with detailed knowledge of students' specific strengths and needs
Theory-Laird's Sensory	Laird (1985)	The adjustment of approaches and resources to as many senses as students need in learning
Theory-Skinner's Behaviourist Theory	Skinner (1936)	The role of environmental factors in influencing behavior to focus on learning
Theory-Maslow's Hierarchy of Needs	Maslow (1943)	People are motivated to achieve certain needs and some needs take precedence over others. The most basic need is physical survival, and this will be the first thing that motivates our behavior
Theory-Rogers' Humanist	Rogers (1959)	Students need an environment that provides authenticity (openness and self-disclosure), acceptance (being seen with unconditional positive regard), and empathy (being listened to and understood).

Table 4 shows that the theory of English reading skills based on local wisdom for D/HH on English teaching materials for deaf and hard of hearing students are theory- cognitive development, theory- learning, theory-Howard Gardner's multiple intelligences, theory-laird's sensory, theory-skinner's behaviourist theory, theory-Maslow's hierarchy of needs, and theory-rogers' humanist

e. English Reading Aided by Audio Visual for the Deaf and Hard of Hearing (D / HH)

Table 5: Theory of English Reading Aided by Audio Visual for D / HH

Review Type	Citation	Description
Theory-Cognitive Development	Piaget (1936)	Piaget's Stages of Cognitive Development, discusses the developmental stages of students encouraging independent and direct learning and opportunities for discovery. Plan a variety of

		classroom activities that accommodate different learning styles such as visual or auditory
Theory-Learning	Vygotsky (1978)	The sociocultural context that surrounds students which facilitate the learning process
Theory-Howard Gardner's Multiple Intelligences	Gardner (1983)	There is human intelligence and learning styles including visual, auditory, kinaesthetic, impulsive and reflective, right brain and left brain. So that students are directed to use a learning style that is tailored to the wishes of each student
Theory-Laird's Sensory	Laird (1985)	Greater learning can occur when the five senses of sight, hearing, touch, smell, and taste are stimulated. So that the adjustment of approaches and resources as much as possible of the students' senses is needed in learning
Theory-Cognitive of Multimedia Learning	Mayer (2005)	Students learn more deeply from words and pictures than just words. The use of words and images for learning media must also pay attention to their effect on the students cognitive
Theory-Information Processing	Miller (1956)	Two concepts of cognitive and psychological processing, namely the first concept of chunking and short-term memory capacity (work) which are the basic elements of all subsequent memory theory. Furthermore, the second concept of information processing,

Table 5 shows that the theory of English reading aided by audio visual for D / HH on English teaching materials for deaf and hard of hearing students are theory-cognitive development, theory-learning, theory-Howard Gardner's multiple intelligences, theory-laird's sensory, theory -cognitive of multimedia learning, and theory-information processing.

f. Deaf and Hard of Hearing (D / HH)

Table 6: Theory of Deaf and Hard Hearing

Review Type	Citation	Description
Statement-The Joint Committee on Infant Hearing	JCIH (2000)	Three components of an early detection program and intervention for deafness and hearing loss including birth examinations (Birth Admission Screening); follow-up and diagnostics; and early intervention (early Intervention)

Table 6 shows that the theory of D / HH on English teaching materials for deaf and hard of hearing students, Statement-The Joint Committee on Infant Hearing.

2.2 Previous Studies

a. Reading for the Deaf and Hard of Hearing (D / HH)

Table 7: Research on Reading for D / HH

Research	Purposes	Result
Broek & Takashima (2018)	Conducting research using 45 students as participants with 2 x 2 experimental designs including learning words through context	The final results show that learning words using context provides results in understanding. When partitions are asked

	<p>(word learning through inferences from context), learning words through retrieval, and the effect of contextual wealth on word retention (effect of contextual). richness on word retention).</p>	<p>to read a novel in English and are asked to provide information based on their understanding, the use of L1 is very helpful for students to provide the understanding obtained according to the known context.</p>
<p>Lervåg, Hulme, Melby-Lervåg (2018)</p>	<p>Using aspects language includes word decoding measured by TOWRE, listening comprehension is measured by NARA and WJ, and vocabulary skills are measured by PPVT and WISC Voc, grammatical skills are measured by ITPA GC and TROG, verbal working memory is measured by L. Recall, and inference skills are measured by inference.</p>	<p>Oral language is an intervention that can improve reading skills in children. This study used 198 students aged 7 years.</p>
<p>Pham, Donovan, & Dam (2018)</p>	<p>Researching through 3 groups of children aged 6-8 years who mastered L1 and L2 words with different levels of ability at L1. In the first group (HSE), participants have a high mastery of L1 and high L2; the second group (LSE) L1 is at a low level with a high L2; while the last group (LVE) is low on L1 and high on L2</p>	<p>This study found that only group one resulted in an increase in L2 mastery. Mastery of L1 in each group increased, but only the high L1 group showed increased L2.</p>
<p>Study, Elgort, Brysbaert & Assche (2018)</p>	<p>Analyze the context of word learning (CWL) in reading using a second language (L2). The text used is expository steam of the text by recording eye movements when the participants read the text to find out the process of understanding words in the text through the reading process eye movements. Furthermore, the use of tests is carried out to measure reading ability and comprehension. Participants consisted of 28 undergraduate and postgraduate students.</p>	<p>The results of the study explain that the participants do not ignore words that are not understood when reading an expository of text using L2, namely English and L1 which is Dutch. So, reading books or reading journals requires caution in understanding the results of these readings which are a follow-up to explanations using L1, namely Dutch.</p>
<p>Tong, McBride, Shu (2018)</p>	<p>Regarding the factors that affect reading comprehension in L1 (Chinese) and L2 (English). Aspects that are measured in this case are vocabulary knowledge, the ability to make conclusions, memory for content, understanding the ideas that have been read with the integration of known knowledge, and the ability to write techniques.</p>	<p>It was concluded that the participants had a low understanding when reading L2 text, especially psychological awareness.</p>
<p>Worsfold, Mahon, Pimperton, Stevenson, Kennedy (2018)</p>	<p>examines expressive language, receptive vocabulary, and grammar skills. The aspects assessed in this study include reading (reading accuracy & reading comprehension), language skills (language comprehension & expressive language, speech intelligibility), & non-verbal.</p>	<p>The use of oral language turned out to provide good understanding for participants in reading for the deaf.</p>
<p>Worster, Pimperton, Ralph-lewis, Monroy, Hulme</p>	<p>This study uses two forms of measurement, namely offline and online. In offline, there is speechreading measured by TOCS, reading is measured by YARC, and vocabulary is measured by The Deaf</p>	<p>Speechreading is an important access to spoken language for deaf people. The data obtained shows that the communication pattern used is in the form of social tuning accompanied by visuals.</p>

- (2018) **Children's Vocabulary Knowledge, and Nonverbal IQ. While online using TOCS ..**
- Bergey, Deacon, & Parrila
- (2017)
- Chevalier, Parrila, Ritchie, & Deacon (2017)
- Cho et al (2017)
- Harris, Terlektsi, & Kyle (2017)
- Karasinski, Anderson, & Karasinski (2017)
- Lundetræ, Judith, Schwippert (2017)
- Identify that there is a relationship between academic achievement, metacognitive strategies, and learning strategies on the reading skills used by students.
- Carry out research on the role of reading metacognitive strategies, metacognitive studies and learning strategies, behavioral studies and learning strategies in predicting academic success in students with reading difficulties (HRD) and without reading difficulties (NRD).
- Recommend dynamic assessment or Dynamic Assessment (DA) to measure the potential for early reading and learning development.
- Using 41 children aged 5-7 years with hearing impairment participated as a sample with an intelligent nonverbal assessment, reading ability, English vocabulary, phonological awareness, and speech reading.
- investigating reading engagement and achievement within the SSMMD framework regarding (a) whether reading interest, reading potential, reading behavior influence reading presentation in eighth grade ?; (b) did reading interest, reading potential, and reading behavior at the previous education level affect reading interest, reading competence, and reading presentation in the eighth grade ?; (c) do reading interest, reading potential, and reading behavior influence reading presen in eighth grade?
- Conducted a study with 1200 students aged 6 years as participants and a reading intervention by evaluating 20 percent of low-achieving students by reading words, spelling, reading, reading interest, and self-
- It was found that students who chose metacognitive strategies in learning to read had a good GPA while on the other hand, students who experienced a lot of difficulty in reading did not use learning strategies and did not apply metacognitive strategies so that it had an effect on their academic achievement results.
- The results of this study confirm that students who apply metacognitive strategies in reading get good academic achievement results compared to students who do not use metacognitive strategies which have an impact on the cumulative score of low academic achievement. So this research recommends selecting a metacognitive strategy in reading which is expected to increase the results of good academic achievement.
- Multiple regression is used in the data analysis which shows that there is a significant effect on the word development of elementary school students in mastering English. DA is used to improve prior knowledge and word reading in reading.
- English vocabulary* and phonological awareness is the most important part in children with hearing impairment as the basis for reading skills. This must be supported by the use of appropriate teaching strategies so that reading skills can develop and improve.
- This study found that socioeconomic status affects reading achievement so that early intervention is needed to improve reading achievement.
- Identification of children at risk of reading difficulties in the early stages of schooling by developing research-based teaching programs, by measuring the long-term effects of early intervention was carried out

	<p>concept. This study conducted early intervention to reduce later reading difficulties. The initial measurements taken were in the form of early literacy motivation, short term memory, RAN, letter knowledge, phonemic awareness, word reading, spelling, and vocabulary. The expected final outcome measures are interest in reading, self-concept reading, word reading, word recognition, spelling, sentence reading, text reading, and reading comprehension.</p>	<p>in this study. So it can be concluded that early intervention in reading skills in children is very necessary.</p>
<p>Trezek (2017)</p>	<p>Evaluating the use of the cued speech communication system in developing reading skills in English for the deaf on the aspects of phonological awareness, phonemic awareness, alphabet knowledge, and phonological memory.</p>	<p>So that cued speech is recommended for use for deaf people</p>
<p>Albertini, Marschark, & Kincheloe (2016)</p>	<p>connecting reading and writing skills for deaf students with stimulating reading and writing comprehension skills.</p>	<p>The results of this study indicate that the ability to write retelling and cohesion is closely related, while reading ability is influenced by the level of understanding, completeness, and cohesion.</p>
<p>Domínguez, Carrillo, González, Alegria (2016)</p>	<p>Conducting research on deaf students with cochlear implants and without implants in reading skills using The Key Word Strategy (KWS) or keyword strategy. 136 deaf children aged 7-14 years in primary and secondary schools were participants in this study. The reading process on participants was tested with several assessments, namely the Reading Ability Test (READ), Semantics Strategies Detection Test (SMT), Syntactic Ability Test (SNT), and Vocabulary Tesy (VOC) specifically for deaf students. The assessment was carried out in two stages, namely READ and SMT in the first stage, and then SNT and VOC.</p>	<p>It was concluded that the linguistic results and reading ability level of deaf students depend on the students' understanding of spoken language and KWS is a strategy used in reading by the participants.</p>
<p>Pellicer-sánchez (2016)</p>	<p>conduct research on the acquisition of second language words through the process of reading and from. The vocabulary test includes form recognition, meaning recall, and meaning recognition with a percentage of 86, 75, and 55.</p>	<p>The process of reading with text that has words whose meaning is unknown to the reader provides a process of repetition and understanding of its own by combining words and reading speed. The repetition of words in reading has an impact on understanding and acquiring good words for the reader. So it can be concluded that there is a relationship based on these three aspects.</p>
<p>Apple & Masterson (2015)</p>	<p>Analyzing students with hearing loss and without hearing loss in linguistic aspects for spelling skills and examining the relationship between reading and spelling. Spelling errors are identified based on components of phonemic awareness,</p>	<p>So it was found that spelling errors in children with hearing impairment occur due to deficiencies in orthographic patterns and morphological awareness. Meanwhile, the relationship between spelling and word reading in text comprehension is still at a low level for deaf children.</p>

orthographic patterns, morphological awareness, and mental representations.

- Benedict, Rivera, & Antia (2015) **Implementing metacognitive strategies including comprehension (comprehension), checking (check), and fixing (repair) on reading strategy habits, non reading strategy habits, and reading comprehension in DHH children. The CC&R strategy as an effective way of teaching reading consists of several components, namely comprehension monitoring, question generation, and question answering. This study uses CC & R strategies to determine the fluency of reading words, how to monitor and solve problems with understanding. Students' reading comprehension is measured after students are asked to read orally and retell it within a minute.** **So it can be concluded that there is a relationship between the instructions used by the teacher in teaching and the learning strategies in reading used by students. Retelling can be an alternative in measuring students' reading comprehension after oral reading.**
- Moreno-pérez, Saldaña, Rodríguez-ortiz (2015) **determine the level of reading efficiency in deaf people of the same age as well as the factors that can predict the level of reading efficiency in deaf people. 80 people became participants who were divided into three groups. The instruments used in this study include TECLE to measure reading efficiency, TVIP to measure vocabulary, phonological awareness test, speechreading test.** **Obtained research results regarding the low level of reading efficiency in hearing impairment due to several factors. Reading efficiency, vocabulary, reading speed, reading accuracy, phonological awareness, and speechreading.**
- Classon et al (2014) **This means that 31 deaf (HI) participants in this study are at least 5 years old and are not deaf (NH) who are deaf in using Swedish as their first language ..** **This study using MANCOVA proved that there was no significant difference between HI and NH participants in terms of fluency performance. The HI fluency letter has a lower vocabulary than the NH group**
- Harlaar et al (2014) **The ability to read a person is based on several factors, one of which is genetic. Measurements were made using Genome-Wide Complex Trait Analysis (GCTA) to assess a person's reading fluency.** **This study found that at the age of 7-12 years the reading ability of a person will increase with varying degrees of difference in reading performance of each individual. The next factor is the children's reading and writing environment such as the cumulative reading experience and the printed books that are read by the children. This study used participant data in the form of DNA collected from 1997-2010 with a total of 3,130 individuals**
- Schirmer & Mcgough (2014) **regarding the development of reading and reading instructions for deaf children in five aspects, namely (a) alphabet or alphabets including phonemic awareness instruction and phonic instruction, (b) fluency; (c) comprehension includes vocabulary instructions or vocabulary instructions, text comprehension instructions or text comprehension instructions; (d) teacher education and** **This study is a recommendation from The National Reading panel (NRP) for deaf children in reading skills**

reading instruction or reading instruction;
 (e) computer technology and reading instruction or vocabulary instruction & text comprehension instruction

<p>Mounty, Pucci, Harmon (2013)</p>	<p>Researching strategies and indicators related to ASL / English for deaf children from the reading learning process to the reading process and the reading to learning process.</p>	<p>Documentation and semi-structured interviews were used as research instruments to explore participants' knowledge, experiences, and perspectives on the use and development of ASL, identify characteristics of reading skills, beliefs about ASL strategies, activities, and practices of using and developing ASL.</p>
<p>Szarkowska, Krejtz (2011)</p>	<p>The study, which was carried out using the animated film "Shrek" in Polish (L1) and English (L2) for deaf, totaled 40 participants aged 18 to ≥ 60 years with 9 deaf grouped, 21 people with hearing difficulties, and 10 people hearing. . Participants were volunteers from the Polish Association of the Deaf via email contact. Each participant was asked three multiple choice questions regarding (a) general understanding of the "shrek" film clip; (b) textual elements of the film; (c) the visual image shown on the film.</p>	<p>The characteristics of the video given to participants are clip duration, reading speed, number of words in the clip, number of characters (including spaces in the clip), total number of captions per clip, percentage of two-line captions per clip. Overall level of understanding based on hearing status and text type, namely verbatim (deaf, 82%); standard (deaf, 73%); and edited (deaf, 63%).</p>
<p>Banner & Wang (2010)</p>	<p>Shows that the determination of reading results is influenced by the type of text, the type of strategy, and the level of education of the deaf readers. The purpose of this research is to identify and test the effectiveness of reading strategies used by adult deaf readers and students</p>	<p>It was concluded that participants in this study could use reading strategies smoothly including constructing meaning, monitoring and improving comprehension, and evaluating comprehension. Narrative text gets better value than expository and periodical. Evaluating comprehension and monitoring and improving comprehension dominate the construction meaning. Furthermore, adult deaf readers are more familiar with many strategies, especially in speaking skills. Third, Evaluating comprehension is a strategy that is often used. Fourth, participants who have high test scores have good communication with their families and get early exposure (applying theories of mind). Fifth, All participants in this study can use a reading strategy, namely think alouds, including visualizing, summarizing, paraphrasing, and prior knowledge. Sixth, the use of ASL was applied by the participants. Seventh, the use of strategies in reading skills in L1 can be used in L2. Finally, the type of text read affects the strategy in understanding the reading text used, namely narrative, periodical, and expository.</p>

Table 7 shows that previous research on reading of D / HH on English teaching materials for deaf and hard of hearing students. So it can be concluded that literacy in DHH children is very important to do with early intervention. Early literacy interventions that can use visual

representations and isysrat language with special instructions (Lederberg, Miller, Easterbrooks, & Connor, 2014; Holmer, Heimann, & Rudner, 2017). Interventions carried out will have a positive impact on aspects of phological awareness, alphabetic knowledge, and vocabulary (Webb, Lederberg, Branum-martin, & Connor, 2015), but the output of early intervention will be influenced by several factors (Statement, 2007; Mayer & Trezek, 2018). DHH students use reading strategies in the form of retelling strategies, metacognitive strategies, oral and KWS strategies (Albertini, Marschark, & Kincheloe, 2016; Benedict, Rivera, & Antia, 2015; Bergey, Deacon, & Parrila, 2017; Chevalier, Parrila, Ritchie, & Deacon, 2017; Domínguez, Carrillo, González, & Alegria, 2016). Whereas in language learning, DHH students can understand L2 text by using L1 according to the context that the student knows and can have a positive impact (Broek & Takashima, 2018; Pham, Donovan, & Dam, 2018; Study, Elgort, Brysbaert, & Assche, 2018). The most important fundamental parts in reading comprehension for DHH students include English vocabulary and phonological awareness (Harris, Terlektsi, & Kyle, 2017; Tong, McBride, & Shu, 2018; Apel & Masterson, 2015; Classon et al., 2014; Schirmer & MCGough, 2014; Trezek, 2017).

Furthermore, Early reading intervention is needed for DHH students so that they can improve reading achievement. These interventions can be in the form of spoken language, sign language (ASL / Bisi / Bisindo), and visual images (Karasinski, Anderson, & Karasinski, 2017; Lundetræ, Judith, & Schwippert, 2017; Szarkowska & Krejtz, 2011; Worsfold, Mahon, Pimperton, Stevenson, & Kennedy, 2018; Worster, Pimperton, Ralph-lewis, Monroy, & Hulme, 2018). The implementation of reading for DHH is influenced by several factors, namely genetics, children's reading environment, socio-economic status (Harlaar et al., 2014; Karasinski, Anderson, & Karasinski, 2017; Moreno-pérez, Saldaña, & Rodríguez-ortiz, 2015).

Meanwhile, in the context of reading assessment, DHH can use Dynamic Assessment (DA) and Recalling (Cho et al., 2017; Pellicer-sánchez, 2016). These interventions can be in the form of spoken language, sign language (ASL / Bisi / Bisindo), and visual images (Karasinski, Anderson, & Karasinski, 2017; Lundetræ, Judith, & Schwippert, 2017; Szarkowska & Krejtz, 2011; Worsfold, Mahon, Pimperton, Stevenson, & Kennedy, 2018; Worster, Pimperton, Ralph-lewis, Monroy, & Hulme, 2018). The implementation of reading for DHH is influenced by several factors, namely genetics, children's reading environment, socio-economic status (Harlaar et al., 2014; Karasinski, Anderson, & Karasinski, 2017; Moreno-pérez, Saldaña, & Rodríguez-ortiz, 2015).

b. Audio Visual for the Deaf and Hard of Hearing (D / HH)

Table 8: Research on Audio Visual for D / HH

Research	Purposes	Result
Knoop-van Campen, Segers, & Verhoeven (2018)	Investigating the effects of modality on learning using multimedia to obtain the benefits of writing with text and images with a sample of 26 students. Multimedia is presented with written text, audio, and combined text and audio.	The results of the study state that there are benefits for students in learning using multimedia. Measurements are made with several instruments, namely general non-verbal intelligence, word decoding, pseudo-word decoding, verbal working memory, and visual working memory.
Salazar, Larenas (2018)	Conduct research on identifying participant performance as a result of implementing audiovisual-based teaching strategies and analyzing participants'	The results of the study found that the use of audiovisual-based materials students could understand more clearly and attractively in learning English. 78% of

	attitudes after using audiovisual-based teaching strategies. Participants were 18 students in Chile aged 4 to 5 years. 60% are visual-kinesthetic learners. During three weeks an audio-visual based teaching strategy is applied.	students showed a good attitude in using good learning strategies based on audiovisuals.
Mills & Unsworth (2018)	Drawing animation on the iPads can teach adolescents to bag and intensify emotions in multimodal communication. The use of animation can have a positive impact in the form of creative attitudes for self-development, literacy practice, and productive media in teaching English with impressive narratives	Animation can provide a deeper understanding of the interpersonal metaphors of written and spoken texts.
Gilliver, Sewell, McGinnity, & Beach (2017)	The effectiveness of animation for deaf students. Target audience age ranges and animation styles to allow for greater levels of control, flexibility and creativity in presentations	Animated videos describe the volume, duration, frequency and content aspects
Colucci (2017)	The use of tools for children with D / HH. The installation of hearing aids is an assisted tool in accordance with the right program in communicating as a companion to communicating in sign language, written language and spoken language.	The recommended tool in this research is the Receiver-in-canal (RIC).
Jahn (2017)	Cochlear implants to improve hearing detection and speech perception for people with severe hearing loss. The integration of auditory and visual input is very important in communicating. Visual and auditory requirements are needed to develop spoken language	The results of the study showed that there was a significant correlation between visual acuity and auditory speech perception for deaf people. This means that individuals who have better visuals with temporal acuity also have better word and sentence recognition.
McCreery (2015)	Animated videos describe the volume, duration, frequency and content aspects in hearing aids for language development for deaf children. The results showed that the children's language development was influenced by the level of hearing loss and consistent use of tools.	Hearing aids that are suitable for children less than 6 months of age have better abilities so it is hoped that services are needed early.
Durkin & Conti-Ramsden (2014)	A qualitative research on the obstacles faced by teachers or facilitators in using language learning media for deaf children	The results of the study recommend that digital media should be used wisely with restrictions, restrictions, and use for children with hearing impairments and without hearing loss. The use of media has an important role to play in the development of better policies and strategies for children with language disorders and digital media.

Table 8 shows that previous research on audio visual for D / HH on English teaching materials for deaf and hard of hearing students. So it can be concluded that children with DHH should be facilitated with audio or visual instruments so that they can help develop language (Bai,

2018; Crowe, Marschark, Dammeyer, & Lehane, 2017; Maiorana-Basas & Pagliaro, 2014; Mingsiritham & Chanyawudhiwan, 2018; Qin & Tao, 2016). In addition, the use of audio-visual in the form of animation in language learning for DHH children (Colucci, 2017; Dayanim & Namy, 2015; Durkin & Conti-Ramsden, 2014; Ferguson, 2017; Gilliver, Sewell, McGinnity, & Beach, 2017; Hayden, Namasivayam, & Ward, 2014; Jahn, 2017; Knoop-van Campen, Segers, & Verhoeven, 2018; Kraus & White-Schwoch, 2016; McCreery, 2015; Mills & Unsworth, 2018; Neger, Janse, & Rietveld, 2014; Salazar & Larenas, 2018; Singendonk et al., 2018; Sommers & Phelps, 2016; Waters, 2017).

c. The Deaf and Hard of Hearing (D / HH)

Table 9: Research for D / HH

Research	Purposes	Result
Duncan & Neill (2018)	D / HH education is still difficult to obtain and decide due to incomplete and conflicting information for the needs of children or families. The D / HH education information system is incomplete and inconsistent with parents. Problems that often arise include modes of communication, early intervention, service agents, and the individual circumstances of each family in the form of child development, parental knowledge, expectations, parental experiences, practitioners, and service agents.	The emphasis is on investigating decision making, preparing practitioners, being free from bias, concentrating and empowering D / HH education.
Broekhof, Boss, Camodeca, & Rieffe (2018)	Investigated and measured the emotional levels of D / HH students towards bullying attitudes of students with normal hearing.	The indicators used in this research are (a) basic emotions in the form of anger and fear; and (b) social emotions (guilt and shame). Participants who participated in this study were 307 D / HH students and 227 students with normal hearing. The instruments used included (a) the personal characteristics test (WISC test and CELF test), and (b) self-report questionnaire (the bully victim, the brief shame guilt, and the mood list).
Holmström & Schönström, (2017)	The research design is a survey to investigate human resources prepared by the government to assist and be responsible for the education of deaf students in public schools in Sweden. The government prepares educators for D / HH students who accompany D / HH education in schools. In this study, the opportunities and obstacles of educators for D / HH will be explored to provide information on education for D / HH.	This research exploration is also related to D / HH students' access to Swedish sign language (SSL) and knowledge of the use of language for D / HH. SSL is the national sign language in Sweden in addition to TSS and TAKK. TSS is used when the situation between the perception and understanding of Swedish language is facilitated in a visual, traditional, and the mode of communication used by D / HH to support spoken Swedish. TAKK is a form of language development for D / HH. The results of the study show that 33% of cities have access to cell phones. The tools and environments created in learning are varied. Participants in the research included five deaf schools and 290 public schools in Sweden. In addition, it shows that many teachers have a significant lack of

Bilingual education is not offered in its conceptual setting.

knowledge about oral communication that is integrated with technology in learning for D / HH students. SSL is very much needed by D / HH children but it is found that the law states that SSL is aimed at those who are needed, so the emphasis of the word 'they' give an ambiguous meaning in its implementation because no one can determine D / HH's needs regarding SSL.

Laugen,
 Jacobsen,
 Rieffe, &
 Wichstrøm
 (2017)

The social skills of UMHL, TH, and MSHL. UMHL and MSHL participants aged 4 to 5 years in Norwegian (L1) from 79 families who were contacted online, only 36 families were willing. 14 children in the UMHL group, 21 children at MSHL. Six participants (2 from UMHL, 4 from MSHL) prefer to use Norwegian sign language with the instrument The Norwegian Version of the Social Skills.

The results showed that vocabulary development had a significant effect on social skills. So, it is highly recommended to all parents for early detection and early intervention in children with D / HH.

Matthen
 (2016)

The relationship between perception, cognitive and social interaction for D / HH from the perspective of obstacles and actions that will reduce learning problems.

It was concluded that students with D / HH were prone to emotional problems and social skills. Additional cognitive demands are emphasized on D / HH. So that in learning it is recommended to use interesting and fun ways in learning. It can collaborate on the implementation of motivation, additional tools, curriculum context, spoken language, sign language, and environmental factors that support the smooth running and achievement of learning goals for D / HH.

Yoshinaga-
 Itano
 (2013)

The stages of early detection of deafness and hearing loss in the third stage, namely early intervention based on JCIH (2000).

This study gave positive responses regarding the components of the third stage which were used as indicators for the research variables. Contributions from this study include (1) each state coordinating on Early Intervention Services; (2) each child or family has access to a service coordinator to obtain supportive knowledge and skills; (3) every child and family who is detected deaf or hearing loss from birth to 3 years get optimal care from professional staff; (4) there are three special needs required, namely listening, listening and spoken language; sign language (sign language); and other specialized methods (other specialized methods), for example integrating communication between visual, listening, listening, and spoken language; (5) implementing and developing Early Hearing Detection and Intervention (EHDI) policies and procedures based on the participation of each family; (6) implementing and developing Early Hearing Detection and Intervention (EHDI) policies and procedures based on individual participation; (7) monitoring system implementation; (8) continuous individual development monitoring to achieve EHDI goals; (9) ensuring the development of the knowledge of the Early Intervention Services, the professional team is met to achieve the educational goals and knowledge of individuals and families of D / HH; (10) identify the type of language used by each

individual and family, for example speaking English or non-English; (11) developing care procedures for linguistically and culturally diverse families. (6) implementing and developing Early Hearing Detection and Intervention (EHDI) policies and procedures based on individual participation; (7) monitoring system implementation; (8) continuous individual development monitoring to achieve EHDI goals; (9) ensuring the development of the knowledge of the Early Intervention Services, the professional team is met to achieve the educational goals and knowledge of individuals and families of D / HH; (10) identify the type of language used by each individual and family, for example speaking English or non-English; (11) developing care procedures for linguistically and culturally diverse families. (6) implementing and developing Early Hearing Detection and Intervention (EHDI) policies and procedures based on individual participation; (7) monitoring system implementation; (8) continuous individual development monitoring to achieve EHDI goals; (9) ensuring the development of the knowledge of the Early Intervention Services, the professional team is met to achieve the educational goals and knowledge of individuals and families of D / HH; (10) identify the type of language used by each individual and family, for example speaking English or non-English; (11) developing care procedures for linguistically and culturally diverse families. (9) ensuring the development of the knowledge of the Early Intervention Services, the professional team is met to achieve the educational goals and knowledge of individuals and families of D / HH; (10) identify the type of language used by each individual and family, for example speaking English or non-English; (11) developing care procedures for linguistically and culturally diverse families. (9) ensuring the development of the knowledge of the Early Intervention Services, the professional team is met to achieve the educational goals and knowledge of individuals and families of D / HH; (10) identify the type of language used by each individual and family, for example speaking English or non-English; (11) developing care procedures for linguistically and culturally diverse families.

Powell, Hyde,
 and Punch
 (2013)

The United States, United Kingdom, and Australia had faced various obstacles regarding education for deaf and hearing-impaired individuals in functional, environmental, classroom participation, curriculum and socio-academic aspects. Meanwhile, New Zealand has restrictions on aspects of policy and funding in the field of education, especially deafness and hearing loss.

The results of this study refer from the perspective of students with the needs they need. The indicators of the variables used include (1) 92% of deaf or hearing impaired students have attended inclusive class education using NZSL, English sign language combined with spoken English; (2) the academic programs studied are arts, social sciences, science, law, commerce, health, theology, music, engineering, and business administration with the diploma, baccalaureate, master, doctoral education levels; (3) communication and participation; (4) curriculum and support services in the form of sign language interpreters, online access, and course content; (5) dissatisfaction is felt in the socio-academic field.

There are several components that affect the level of high school education for D / HH individuals

In this context, the selection of high schools is divided into (1) only regular schools; (2) only special schools; and (3) a combination of special and regular schools. The data collection is analyzed based on several components. First, demographics found that the selection of secondary schools was based on gender, ethnicity, family income, mother's education level, live with both parents. Second, the characteristics of disabilities was based on students with hearing difficulties (hard of Hearing) only chose regular schools, deaf students (Deaf) only chose special schools, and students with other disabilities (others) just choose regular school. Third, the level of hearing ability was based on the severity of hearing loss, cochlear implants, using hearing aids. Fourth, types of communication methods and skills were based on communication used, sign language users, how well they communicate, how clearly, they speak, how clearly, they communicate, how clear they understand. Fifth, functional and social skills was based on mental functional skill scale, social skills scale, self-care skills scale. Sixth, the history of education was based on following basic education, not detained in class, suspended or expelled from school. Seventh, parents hope, attend secondary school, working and getting a salary.

Shaver,
 Marschark,
 Newman, &
 Marder

(2013)

Table 9 shows that previous research on D / HH on English teaching materials for deaf and hard of hearing students. Based on the theory and research that has been done, it can be concluded that the JCIH (2007) provisions regarding the components of early detection programs and interventions for deafness and hearing loss include birth examinations (Birth Admission Screening); follow-up and diagnostics (Follow-Up Screen and Diagnostic); and early intervention (Early Intervention) needs to be implemented to prepare for the needs of DHH children, especially in the field of education (J. Duncan & O'Neill, 2018; Holmström & Schönström, 2017; Powell, Hyde, & Punch, 2013; Shaver, Marschark, Newman, & Marder, 2013; Yoshinaga-itano, 2013). Children with DHH also have emotional levels that can exceed children who can hear (Broekhof, Bos, Camodeca, & Rieffe, 2018; Matthen, 2016) so that it will affect the social skills that DHH will go through for the future (Laugen, Jacobsen, Rieffe, & Wichstrøm, 2017; Matthen, 2016).

d. Learning English for the Deaf and Hard of Hearing (D / HH)

Table 10: Research on Learning English for D / HH

Research	Purposes	Result
Ammar & Hassan (2018)	The collaborative contribution of dialogue to the development of the grammatical morphology of students using French as a second language. The variation of students' proficiency in linguistic mastery is focused on this research.	It is found that students who have low abilities in learning the use of collaborative dialogue are beneficial for the development of language skills. The dictation system carried out in this study did not contribute to the development of students' L2 abilities. Participants in this study 79 students were in grades 5 and 6.

Comeaux & McDonald (2018)	<p>The results of the study that increased visual input (VIE) could improve students' grammar in mastery of English which contained four linguistic elements, namely the verb agreement, case marking, animacy, and word order. In the first experiment, there were benefits for word development for students even though the animation used had low validity.</p>	<p>So, it is concluded that the use of VIE can improve L2 word mastery for students.</p>
Hwang, Shin, & Hartsuiker (2018)	<p>31 participants in this study who used Korean and English. The material used is transitive which is given information about verbs and nouns.</p>	<p>The results showed that the participants produced 60% active sentences and 40% passive sentences. Bilingual syntactic processing is influenced by the proficiency of participants in L2. The English construction differs from the Korean construction in the sentences that are formed. This shows that there is difficulty in mastering L2 (English) for the participants. The differences and similarities in sentence construction in English and Korean show that bilingual is highly integrated</p>
Jach (2018)	<p>The acquisition of a second language (English) with mastery of the first language in the form of Chinese and German. Proposition Placement and Relative</p>	<p>The results of the research show that good command of a second language fulfils the aspects of participant participation, participant L1 language, L2 use, and L2 competence of participants. Participants totaling 251 people recruited online. German participants were particularly sensitive to agreement errors, and Chinese participants were sensitive to word order errors. Input frequency and similarity in language acquisition and language construction.</p>
Marsden, Morgan-Short, Thompson, & Abugaber (2018)	<p>Language replication in the form of 400 articles from 1973 to 2015.</p>	<p>The results of this study recommended 16 things regarding reason, nomenclature, design, infrastructure, and incentives for collaboration and language publication. This replication is in the form of close replication, approximate replication, partial replication, conceptual, and replicates with high value replications.</p>
Morgan-Short et al. (2018)	<p>60 students from majoring universities in Spanish. Multi-replication is used as an approach to acquiring English as a second language</p>	<p>It was found that there was no effect on reading comprehension and listening to L2.</p>
Nagle (2018)	<p>Perception, language instruction, and the relationship between perception and production of L2 used. In this context, English is the second language, namely Spanish and English as the first language. The participants have the characteristics of having studied Spanish from several countries of their origin.</p>	<p>The results show that there is a significant relationship between the perceptual accuracy and the accuracy of Spanish production (L2).</p>

MK Duncan & Lederberg (2018)	<p>The relationship between the communication between teachers and D / HH students in the classroom. This takes the form of student statements, language pronouncing, explicit vocabulary and syntax instructions. This study observed the characteristics of teacher speech in 25 kindergartens with 68 D / HH children.</p>	<p>The results of the study suggest that explicit word teaching provides significant value. Explicit instruction in teaching vocabulary is crucial in the success of learning</p>
Fuchs, Fuchs, & Malone (2018)	<p>The Taxonomy of Intervention Instensity which includes the dimensions of strength, dosage, alignment, attention to transfer, comprehensiveness, behavioral support, and individualization</p>	<p>This taxonomy defines intensive interventions through platforms and identifies platforms that can assist implementation for D / HH students.</p>
Joshi & Bouck (2017)	<p>The services received by D / HH children and learning outcomes at school. Participants who participated in this research consisted of 289,720 students. 44.9% of students compacted learning instructions like classes in general.</p>	<p>So that it can be concluded that the instruction of learning in the classroom for deaf students can use learning intrusions such as general classes which have an impact on the short and long term.</p>
Lin (2017)	<p>Strategies used in communicating with deaf children. Data obtained shows that if you cannot master the communication improvement strategy appropriately, it will affect the motivation to communicate so that early intervention is needed to prevent this.</p>	<p>There are several strategies for communicating with deaf students, for example asking for repetition, asking for specific clarification, and recognizing non-verbal cues. The statement of special clarification can take the form of (a) other words by repeating words that are not understood; (b) revision is repetition with a word that is younger to understand; (c) addition, namely adding words that are better known to students; (d) cues in the form of accompanying verbal words; and (e) proposing topics in the form of topics of discussion</p>
Mahboubi (2017)	<p>The awareness of the importance of understanding the importance of one's functional hearing</p>	<p>Screening measures are needed to maintain hearing in the future in accordance with the work at hand. One of them is by doing cochlear implants, and this is recommended to carry out the learning process well.</p>
Riccomini, Morano, & Hughes (2017)	<p>Special education including intensive instructions, explicit instruction, high-leverage practices, and specially designed instruction. Specially designed instructional instruction includes classroom instruction, physical instruction in education, home teaching, and instruction in institutions or hospitals.</p>	<p>First, Specific instruction designs cover the unique needs of the child and the curriculum in general. Furthermore, useful practices are in the form of collaboration, assessment, social, emotional, behavioral, and instruction. Explicit instruction includes the application of scaffolding in class as well as effective principles and elements. Lastly, intensive specially designed instruction</p>
Bonino (2017)	<p>The abilities of infants and young children with hearing impairments in reading skills.</p>	<p>The results of this study indicate that there is response and behavior using videos and</p>

Singh & Kathleen Pichora-Fuller (2016)	The method used is Play Observer-based, two intervals (PlayO2I).	games. So it is expected that it will increase the participant's cognitively later
Housen & Simoens (2016)	There is a significant effect of the availability of social support on the satisfaction of hearing aids.	Furthermore, a communication strategy is needed in communicating. Thus, planning and early intervention are needed in determining the expected learning outcomes and instructions. Explicit instruction includes the application of scaffolding in class as well as effective principles and elements. Lastly, intensive specially designed instruction.
McMillan & Saffran (2016)	The difficulties in using L2 on the aspects of feature-related difficulties, context related difficulty, and learner-related difficulty.	This study discusses several aspects, namely the influence of L2 targets, learning conditions, and individual learning along with nature and difficulties of mastering L2.
Herman et al. (2015)	Learning in the complex auditory environment of early word learning. Participants consisted of 40 students aged 27 to 30 months. The use of visuals is very influential on the results of this study. Learning new words uses visuals by assigning labels to each object.	So it can be concluded that there are several factors that influence the learning situation in the classroom, one is the use of appropriate learning media
McCarthy, Mahon, Rosen, & Evans (2014)	Evaluating the use of Core Vocabulary Intervention (CVT) for deaf students' English learning.	The Total Communication method is also used in this research to teach English sign language vocabulary to deaf students in elementary schools.
McCarthy, Mahon, Rosen, & Evans (2014)	The effects of language disruption in children on early childhood acquisition of both languages and the development of language trajectories. Participants were 40 children aged 47 to 57 months in Bangladeshi and English. The results of this study show that the use of L1 and L2 languages facilitates the development of phonological categorization and understanding of the development of production and perception of L1 and L2 languages. There is difficulty in using the second language because it is still assimilating the first language and there are differences in the performance of children who use monolingual and bilingual children.	So, it can be concluded that there is a relationship between perceptual accuracy and production accuracy
Evans (2014)	The effects of language impairment for children on early childhood acquisition of both languages and the development of language trajectories. Participants were 40 children aged 47 to 57 months in Bangladeshi and English.	The results of this study show that the use of L1 and L2 languages facilitates the development of phonological categorization and understanding of the development of production and perception of L1 and L2 languages. There is difficulty in using the second language because it is still assimilating the first language and there are differences in the performance of children who use monolingual and bilingual children. So, it can be concluded that there

is a relationship between perceptual accuracy and production accuracy.

Trussell & Easterbrooks (2014)	<p>Vygotsky's theory to measure whether there is a significant effect of word mastery through American Sign Language (ASL), spoken English, or combining the two using storybook intervention and picture vocabulary in individual D / HH. There are three books used as an intervention, namely the book 1-Sheep in a Shop, book 2-If You Give a Mouse, and book-3 I Want a Luch Box by using questions in the form of completion, recall, open- ended, wh-, and distance questions. In Isaac's data, Lily, Mitch, show consistent and increasing intervention results. Casey and Yara's data show only book-3 which is inconsistent and does not improve; but in Mandy's data the intervention was not successful due to factors of age, individual habits, and not well documented learning results.</p>	<p>This study recommends the Enhanced Storybook Interaction to support language learning for D / HH individuals to communicate, visual, explicit instruction, scaffolding and mediation, and higher order thinking skills</p>
Lam (2012)	<p>There is no difference between D / HH and normal students. Recommendations in the form of finding the best about education, communicative and social for each deaf student because of their different needs. The importance of changing the parafihma thinking about the perceptions in society regarding these aspects</p>	<p>So that it creates the idea that deaf students have the same abilities as normal children in general</p>

Table 10 shows that previous research on Learning English for D / HH on English teaching materials for deaf and hard of hearing students.

3. Methodology

This research is a literature study by examining previous studies and theoretical studies related to English reading skills based on local wisdom with audio-visual assistance for deaf students. The results of the literature review will be used to identify the English language needs of deaf students in Pekanbaru City Senior High School.

4. Conclusion

Based on a study of the theories that have been described, deaf students need English language teaching materials with the following criteria, namely: (1) adapting ideas to accommodate new information for students; (2) the context and content of the learning process to facilitate the students learning; (3) provide special strengths and needs of students in learning; (4) adjusting the students' senses to learning tools needs to be maximized; (5) obtain an environment that provides authenticity, acceptance, and empathy; (6) pay attention to cognitive suitability with learning devices; and (7) cognitive processing and student psychology in learning. Reading skills of deaf students are expected to meet the following criteria: (1) achieve a higher level of knowledge and performance to support a culture of reading and writing; (2) adjusting the approach and senses of students in learning reading skills; (3) motivating students to achieve

competence; (4) trusting students to achieve their goals, desires to learn and desires in life if they actualize themselves to achieve their potential; (5) clarifying students' intelligence and directing learning styles adapted to reading skills; (6) emphasize the role of environmental factors in influencing students' reading behavior; (7) students must acquire new skills, knowledge, and attitudes from each lesson; (8) competent in reading skills will get a position that requires different skills. The teaching materials for reading skills based on local wisdom have met the criteria based on the theoretical study described, which includes: (1) students take an active role in the learning process to interact with the world around them; (2) the sociocultural context that surrounds students who facilitate the learning process; (3) students how to access content to enhance learning, show students' knowledge and skills to increase learning engagement, as well as instruction with detailed knowledge of specific strengths and student needs; (4) adjusting the approach and resources as much as possible of the students' senses needed in learning; (5) environmental factors in influencing behavior to focus on learning and (6) students need an environment that provides authenticity. The teaching materials for English reading skills assisted by audio-visual meets the following criteria: (1) accommodate different learning styles such as visual or auditory; (2) adjusting the approaches and sources of the deaf students' senses in learning; (3) pay attention to the effect of words and pictures on students' cognitive; and (4) cognitive and psychological processing. So that learning media in the form of audio-visual learning English reading skills is needed to reach different stages in development, add, develop, and adapt previously held ideas to accommodate new information on cognitive, affective, and psychomotor.

References

- Albertini, JA, Marschark, M., & Kincheloe, PJ (2016). Deaf Students' Reading and Writing in College: Fluency, Coherence, and Comprehension. 303–309. <https://doi.org/10.1093/deafed/env052>
- Ammar, A., & Hassan, RM (2018). Talking It Through: Collaborative Dialogue and Second Language Learning. *Language Learning*, 68 (1), 46–82. <https://doi.org/10.1111/lang.12254>
- Apple, K., & Masterson, JJ (2015). Comparing the Spelling and Reading Abilities of Students With Cochlear Implants and Students With Typical Hearing. 125–135. <https://doi.org/10.1093/deafed/env002>
- Banner, A., & Wang, Y. (2010). An Analysis of the Reading Strategies Used by Adult and Student Deaf Readers. 2–23. <https://doi.org/10.1093/deafed/enq027>
- Benedict, KM, Rivera, MC, & Antia, SD (2015). Instruction in Metacognitive Strategies to Increase Deaf and Hard-of-Hearing Students' Reading Comprehension. 1–15. <https://doi.org/10.1093/deafed/enu026>
- Bergey, BW, Deacon, SH, & Parrila, RK (2017). Metacognitive Reading and Study Strategies and Academic Achievement of University Students With and Without a History of Reading Difficulties. <https://doi.org/10.1177/0022219415597020>
- Bloom, BS (1956). *Taxonomy of educational objectives, handbook I: the cognitive domain*. New York: David McKay Co Inc.
- Bonino, AY (2017). Innovative Hearing Test for Toddlers and Preschoolers. *Hearing Journal*, 70 (11), 6. <https://doi.org/10.1097/01.HJ.0000527207.28817.a6>
- Broek, GSE Van Den, & Takashima, A. (2018). Contextual Richness and Word Learning: Context Enhances Comprehension but. (June), 546–585. <https://doi.org/10.1111/lang.12285>
- Broekhof, E., Bos, MGN, Camodeca, M., & Rieffe, C. (2018). and Emotions in Deaf and Hard of Hearing Adolescents. 17–27. <https://doi.org/10.1093/deafed/enx036>

- Chevalier, TM, Parrila, R., Ritchie, KC, & Deacon, SH (2017). The Role of Metacognitive Reading Strategies, Metacognitive Study and Learning Strategies, and Behavioral Study and Learning Strategies in Predicting Academic Success in Students With and Without a History of Reading Difficulties. <https://doi.org/10.1177/0022219415588850>
- Cho, E., Compton, DL, Gilbert, JK, Steacy, LM, Collins, AA, & Lindström, ER (2017). Development of First-Graders' Word Reading Skills: For Whom Can Dynamic Assessment Tell Us More? <https://doi.org/10.1177/0022219415599343>
- Cho, E., Compton, DL, Gilbert, JK, Steacy, LM, Collins, AA, & Lindström, ER (2017). Development of First-Graders' Word Reading Skills: For Whom Can Dynamic Assessment Tell Us More? <https://doi.org/10.1177/0022219415599343>
- Classon, E., Löfkvist, U., Rudner, M., Rönnerberg, J., Classon, E., Löfkvist, U.,... Rönnerberg, J. (2014). Verbal fluency in adults with postlingually acquired hearing impairment Verbal fluency in adults with postlingually acquired hearing impairment. 5728. <https://doi.org/10.1179/205057113X13781290153457>
- Colucci, D. (2017). 6 Steps to Embed RIC Hearing Aids. *Hearing Journal*, 70 (8), 42–44. <https://doi.org/10.1097/01.HJ.0000524327.95376.ac>
- Comeaux, I., & McDonald, JL (2018). Determining the Effectiveness of Visual Input Enhancement Across Multiple Linguistic Cues. *Language Learning*, 68 (1), 5–45. <https://doi.org/10.1111/lang.12255>
- Domínguez, A., Carrillo, M., González, V., & Alegria, J. (2016). How Do Deaf Children With and Without Cochlear Implants Manage to Read Sentences: The Key Word Strategy. (2013), 280–292. <https://doi.org/10.1093/deafed/enw026>
- Duncan, MK, & Lederberg, AR (2018). Relations Between Teacher Talk Characteristics and Child Language in Spoken-Language Deaf and Hard-of-Hearing Classrooms. *Journal of Speech, Language, and Hearing Research*, 61 (12), 2977–2995. https://doi.org/10.1044/2018_jslhr-l-17-0475
- Duncan, MK, & Lederberg, AR (2018). Relations Between Teacher Talk Characteristics and Child Language in Spoken-Language Deaf and Hard-of-Hearing Classrooms. *Journal of Speech, Language, and Hearing Research*, 61 (12), 2977–2995. https://doi.org/10.1044/2018_jslhr-l-17-0475
- Durkin, K., & Conti-Ramsden, G. (2014). Turn off or tune in? What advice can SLTs, educational psychologists and teachers provide about uses of new media and children with language impairments? *Child Language Teaching and Therapy*, 30 (2), 187–205. <https://doi.org/10.1177/0265659013511471>
- Erikson, Erik. (1958). *Young man Luther*. New York: Norton.
- Flavell, JH (1981). Cognitive Monitoring, In WP Dickson (Ed.), *Children's oral communication* (pp. 35-60). New York: Academic Press
- Fuchs, LS, Fuchs, D., & Malone, USA (2018). The Taxonomy of Intervention Intensity. *TEACHING Exceptional Children*, 50 (4), 194–202. <https://doi.org/10.1177/0040059918758166>
- Gagne, Robert Mills. (1965). *The Conditions of Learning*. New York: Holt, Rinehart, and Winston
- Gardner, H. (1983). *Frames of minds: the theory of multiple intelligences*. New York: Basic Books.
- Gilliver, BM, Sewell, J., McGinnity, S., & Beach, E. (2017). *Through Animation*. (September), 14–15.
- Gough, PB, & Tunmer, WE (1977). *Decoding, Reading, and Reading Disability*.
- Harlaar, N., Trzaskowski, M., Dale, PS, & Plomin, R. (2014). Word Reading Fluency: Role of Genome-Wide Single-Nucleotide Polymorphisms in Developmental Stability and Correlations With Print Exposure. *Child Development*, 85 (3), 1190–

1205. <https://doi.org/10.1111/cdev.12207>
- Harris, M., Terleksi, E., & Kyle, FE (2017). Concurrent and Longitudinal Predictors of Reading for Deaf and Hearing Children in Primary School. 233–242. <https://doi.org/10.1093/deafed/enw101>
- Herman, R., Ford, K., Thomas, J., Oyebade, N., Bennett, D., & Dodd, B. (2015). Evaluation of core vocabulary therapy for deaf children: Four treatment case studies. *Child Language Teaching and Therapy*, 31 (2), 221–235. <https://doi.org/10.1177/0265659014561875>
- Holmer, E., Heimann, M., & Rudner, M. (2017). Computerized Sign Language-Based Literacy Training for Deaf and Hard-of-Hearing Children. 404–421. <https://doi.org/10.1093/deafed/enx023>
- Holmström, I., & Schönström, K. (2017). Resources for deaf and hard-of-hearing students in mainstream schools in Sweden. A survey. *Deafness and Education International*, 19 (1), 29–39. <https://doi.org/10.1080/14643154.2017.1292670>
- Housen, A., & Simoens, H. (2016). Introduction: Cognitive Perspectives on Difficulty and Complexity in L2 Acquisition. *Studies in Second Language Acquisition*, 38 (02), 163–175. <https://doi.org/10.1017/s0272263116000176>
<http://www2.psych.utoronto.ca/users/peterson/psy430s2001/Miller%20GA%20Magic%20Seven%20Psych%20Review%201955.pdf>
- Hwang, H., Shin, JA, & Hartsuiker, RJ (2018). Late Bilinguals Share Syntax Unsparingly Between L1 and L2: Evidence From Crosslinguistically Similar and Different Constructions. *Language Learning*, 68 (1), 177–205. <https://doi.org/10.1111/lang.12272>
- Jach, D. (2018). A Usage-Based Approach to Preposition Placement in English as a Second Language. *Language Learning*, 68 (1), 271–304. <https://doi.org/10.1111/lang.12277>
- Jahn, KN (2017). Is Visual Processing Related to Auditory Speech Perception in CIs? *Hearing Journal*, 70 (12), 22–23. <https://doi.org/10.1097/01.HJ.0000527879.00238.6b>
- Joshi, GS, & Bouck, EC (2017). Examining Postsecondary Education Predictors and Participation for Students With Learning Disabilities. *Journal of Learning Disabilities*, 50 (1), 3–13. <https://doi.org/10.1177/0022219415572894>
- Karasinski, C., Anderson, K., & Karasinski, C. (2017). Third grade and concurrent predictors of engagement and achievement in reading in eighth grade reading in eighth grade. 5728. <https://doi.org/10.1080/2050571X.2017.1290739>
- Knoop-van Campen, CAN, Segers, E., & Verhoeven, L. (2018). The modality and redundancy effects in multimedia learning in children with dyslexia. *Dyslexia*, 24 (2), 140–155. <https://doi.org/10.1002/dys.1585>
- Laird, Dugan. (1985). Approaches to training and development. Addison-Wesley publishing company, Inc. <https://archive.org/details/approachesotrai00lair/page/n5/mode/2up>
- Lam, BJ (2012). Breaking down barriers. *Nature Photonics*, 6 (9), 567–567. <https://doi.org/10.1038/nphoton.2012.230>
- Laugen, NJ, Jacobsen, KH, Rieffe, C., & Wichstrøm, L. (2017). Social skills in preschool children with unilateral and mild bilateral hearing loss. *Deafness and Education International*, 19 (2), 54–62. <https://doi.org/10.1080/14643154.2017.1344366>
- Lederberg, AR, Miller, EM, Easterbrooks, SR, & Connor, CM (2014). Foundations for Literacy: An Early Literacy Intervention for Deaf and Hard-of-Hearing Children. <https://doi.org/10.1093/deafed/enu022>
- Lervåg, A., Hulme, C., & Melby-Lervåg, M. (2018). Unpicking the Developmental Relationship Between Oral Language Skills and Reading Comprehension: It's Simple, But Complex. *Child Development*, 89 (5), 1821–1838. <https://doi.org/10.1111/cdev.12861>
- Lin, KJ (2017). Communication Repair Strategies for Hearing-Impaired Children. *Hearing*

- Journal, 70 (8), 18–20. <https://doi.org/10.1097/01.HJ.0000524328.07946.83>
- Lundetrae, K., Judith, O., & Schwippert, K. (2017). Protocol: 'On Track', a group-randomized controlled trial of an early reading intervention. *International Journal of Educational Research*, 86 (October), 87–95. <https://doi.org/10.1016/j.ijer.2017.08.011>
- Mahboubi, H. (2017). Gaps in Evaluating, Managing Hearing Difficulties. *Hearing Journal*, 71 (3), 6. <https://doi.org/10.1097/01.HJ.0000531213.09823.63>
- Marschark, M., Paivio, A., Spencer, LJ, Durkin, A., Convertino, C., & Machmer, E. (2018). Don't Assume Deaf Students are Visual Learners. 29 (1), 153–171. <https://doi.org/10.1007/s10882-016-9494-0.Don>
- Marsden, E., Morgan-Short, K., Thompson, S., & Abugaber, D. (2018). Replication in Second Language Research: Narrative and Systematic Reviews and Recommendations for the Field. *Language Learning*, 68 (2), 321–391. <https://doi.org/10.1111/lang.12286>
- Maslow, AH (1943). A theory of human motivation. *Psychological Review*, 50 (4), 370 - 396. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.318.2317&rep=rep1&type=pdf>
- Maslow, AH (1943). A theory of human motivation. *Psychological review*, 50, 370-396. Doi: <http://dx.doi.org/10.1037/h0054346>
- Matthen, M. (2016). Effort and Displeasure in People Who Are Hard of Hearing. 28–34.
- Mayer, C., & Trezek, BJ (2018). Literacy Outcomes in Deaf Students with Cochlear Implants: Current State of the Knowledge. 1–16. <https://doi.org/10.1093/deafed/enx043>
- McCarthy, KM, Mahon, M., Rosen, S., & Evans, BG (2014). Speech perception and production by sequential bilingual children: A longitudinal study of voice onset time acquisition. *Child Development*, 85 (5), 1965–1980. <https://doi.org/10.1111/cdev.12275>
- McCreery, R. (2015). Do hearing AIDS support language development in children with hearing loss? *Hearing Journal*, 69 (5), 8–9. <https://doi.org/10.1097/01.HJ.0000483268.77569.b5>
- McMillan, BTM, & Saffran, JR (2016). Learning in Complex Environments: The Effects of Background Speech on Early Word Learning. *Child Development*, 87 (6), 1841–1855. <https://doi.org/10.1111/cdev.12559>
- Miller, GA (1956). Miller's Magic Number. Accessed from:
- Mills, KA, & Unsworth, L. (2018). iPad Animations: Powerful Multimodal Practices for Adolescent Literacy and Emotional Language. *Journal of Adolescent and Adult Literacy*, 61 (6), 609–620. <https://doi.org/10.1002/jaal.717>
- Moreno-pérez, FJ, Saldaña, D., & Rodríguez-ortiz, IR (2015). Reading Efficiency of Deaf and Hearing People in Spanish. (2000), 374–384. <https://doi.org/10.1093/deafed/env030>
- Morgan-Short, K., Marsden, E., Heil, J., Issa, BI, Leow, RP, Mikhaylova, A.,... Szudarski, P. (2018). Multisite Replication in Second Language Acquisition Research: Attention to Form During Listening and Reading Comprehension. *Language Learning*, 68 (2), 392–437. <https://doi.org/10.1111/lang.12292>
- Mounty, JL, Pucci, CT, & Harmon, KC (2013). How Deaf American Sign Language / English Bilingual Children Become Proficient Readers: An Emic Perspective. <https://doi.org/10.1093/deafed/ent050>
- Nagle, CL (2018). Examining the Temporal Structure of the Perception – Production Link in Second Language Acquisition: A Longitudinal Study. *Language Learning*, 68 (1), 234–270. <https://doi.org/10.1111/lang.12275>
- National Early Literacy Panel. (2008). Developing early literacy: report of the national early literacy panel. Washington DC: National Institute for literacy.
- Pellicer-sánchez, A. (2019). INCIDENTAL L2 VOCABULARY ACQUISITION FROM AND WHILE An Eye-Tracking Study. 97–130. <https://doi.org/10.1017/S0272263115000224>
- Peter, LJ, & Hull, R. (1970). *The Peter Principle*. New York: Bantam

- Pham, G., Donovan, D., & Dam, Q. (2018). Learning Words and Definitions in Two Languages: What Promotes Cross-Language Transfer? (March), 206–233. <https://doi.org/10.1111/lang.12274>
- Piaget, Jean. (1936). *Origins of intelligence in the child*. London: Routledge & Kegan Paul
- Powell, D., Hyde, M., & Punch, R. (2013). Inclusion in Postsecondary Institutions With Small Numbers of Deaf and Hard-of-Hearing Students: Highlights and Challenges. <https://doi.org/10.1093/deafed/ent035>
- Putri, ME., Zaim, M., Asri, Y. (2020). Assessment to Enhance Deaf Students' Needs of English Foreign Language Teaching in Riau Province, Indonesia. *Psychology & Education*, 57(8), 472-492.
- Putri, ME., Zaim, M., Asri, Y., Wahyuni, S. (2021). Materials Development of English Language Learning and Teaching for Deaf Students. *International Conference on Education, Social Sciences and Engineering (ICESE 2021) Conference Proceeding*, 116-139.
- Riccomini, PJ, Morano, S., & Hughes, CA (2017). Big Ideas in Special Education: Specially Designed Instruction, High-Leverage Practices, Explicit Instruction, and Intensive Instruction. *Teaching exceptional children*, 50 (1), 20–27. <https://doi.org/10.1177/0040059917724412>
- Rogers, CR (1959). A theory of therapy, personality, and interpersonal relationship: as developed in the client-centered framework. In (ed) S. Koch, *Psychology: a study of a science*, vol 3: formulation of the person and the social context. New York: McGraw Hill.
- Salazar, GU, & Larenas, CD (2018). Using an Audiovisual Materials-Based Teaching Strategy to Improve EFL Young Learners' Understanding of Instructions *Uso de una estrategia de enseñanza sustentada en audiovisual material para el mejoramiento de la comprensión de instrucciones en niños que*. 25 (2), 91–112.
- Schirmer, BR, & MCGOUGH, SM (2014). Teaching Reading to Children Who Are Deaf: Do the Conclusions of the National Reading Panel Apply? *Teaching Reading to Children Who Are Deaf: Do the Conclusions of the National Reading Panel Apply?* (March 2005). <https://doi.org/10.3102/00346543075001083>
- Shaver, DM, Marschark, M., Newman, L., & Marder, C. (2013). Who Is Where? Characteristics of Deaf and Hard-of-Hearing Students in Regular and Special Schools. <https://doi.org/10.1093/deafed/ent056>
- Singh, G., & Kathleen Pichora-Fuller, M. (2016). The benefits of social support for listeners with impaired hearing. *Hearing Journal*, 69 (2). <https://doi.org/10.1097/01.HJ.0000480892.70956.af>
- Skinner, BF (1936a). Conditioning and extinction and their relation to drive. *Journal of General Psychology*, 14, 296-317
- Statement, P. (2007). Year 2007 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention. <https://doi.org/10.1542/peds.2007-2333>
- Study, ANE, Elgort, I., Brysbaert, M., & Assche, E. Van. (2018). Contextual word learning during reading in a. 40, 341–366. <https://doi.org/10.1017/S0272263117000109>
- Szarkowska, A., & Krejtz, I. (2011). Verbatim, Standard, or Edited?: Reading Patterns of Different Captioning Styles Among Deaf, Hard of Hearing, and Hearing Viewers. (September). <https://doi.org/10.1353/aad.2011.0039>
- Tong, X., McBride, C., & Shu, H. (2018). Reading Comprehension Difference in Chinese - English Bilingual Children. 83 (September 2017), 59–83. <https://doi.org/10.1002/dys.1566>
- Trezek, BJ (2017). Cued Speech and the Development of Reading in English: Examining the Evidence. 349–364. <https://doi.org/10.1093/deafed/enx026>
- Trussell, JW, & Easterbrooks, SR (2014). The effect of enhanced storybook interaction on

- signing deaf children's vocabulary. *Journal of Deaf Studies and Deaf Education*, 19 (3), 319–332. <https://doi.org/10.1093/deafed/ent055>
- Vygotsky, LS (1978). *Mind in society: the development of higher psychological processes*. Massachusetts: Harvard University Press
- Webb, M., Lederberg, AR, Branum-martin, L., & Connor, CM (2015). Evaluating the Structure of Early English Literacy Skills in Deaf and Hard-of-Hearing Children. 343–355. <https://doi.org/10.1093/deafed/env024>
- Webb, M., Lederberg, AR, Branum-martin, L., & Connor, CM (2015). Evaluating the Structure of Early English Literacy Skills in Deaf and Hard-of-Hearing Children. 343–355. <https://doi.org/10.1093/deafed/env024>
- Worsfold, S., Mahon, M., Pimperton, H., Stevenson, J., & Kennedy, C. (2018). Research in Developmental Disabilities Predicting reading ability in teenagers who are deaf or hard of hearing: A longitudinal analysis of language and reading. *Research in Developmental Disabilities*, 77 (February), 49–59. <https://doi.org/10.1016/j.ridd.2018.04.007>
- Worster, E., Pimperton, H., Ralph-lewis, A., Monroy, L., & Hulme, C. (2018). Eye Movements During Visual Speech Perception in Deaf and Hearing Children. (June), 159–179. <https://doi.org/10.1111/lang.12264>
- Yoshinaga-itano, C. (2013). Principles and Guidelines for Early Intervention After Confirmation That a Child Is Deaf or Hard of Hearing. <https://doi.org/10.1093/deafed/ent043>