

# CHAPTER II

## REVIEW OF RELATED LITERATURE

This chapter give important background information for the discussion of related literature. The researcher is going to describe some theories. The discussion consist of : (1) Autism Spectrum Disorder with High Function (2) Cognitive level in for ASD. (3) Reading Literacy for ASD

### 2.1 Autism Spectrum Disorder with High Function

ASD is disoreder that attack neurodevelopment in brain function. According to the Diagnostic and Statistical Manual for Mental Disorders (DSM-5), which was adapted from the American Psychiatric Associations, people who were diagnosed as Autism Spectrumn Disorder experienced difficulties in communication, were not interested in something done repeatedly, symptoms and habits sometimes hurt people around they. Autism spectrum disorder (ASD) is a developmental disorder characterized by a disruption of reciprocal communication and social interaction and the existence of limited behavioral and interests stereotypes (American Psychiatric Association, 2013) There are many factors to support Autism Spectrum Disorder Occurs primarily focusing on genetic factors for parents (predisposed to mothers) with autistic children who often have concomitant intellectual disabilities and language disorders expressed by (Hayes & Watson, 2013; Milgram & Atzil, 1988) (for example (Burke & Heller, 2016; Hayes & Watson, 2013; Milgram & Atzil, 1988) At present ASD attracts attention in many studies in the world, people who do not have intellectual disabilities, high

functioning ASDs have average intelligence (IQ > 70) and is often considered to have 'a lighter type of ASD (Baron-cohen, 2000a) High function with Autism has similarities to Asperger's syndrome but is not the same in language (American Psychiatric Association, Diagnostic and statistical manual of mental Disorder, 2000) Evidence from clinical diagnoses and empirical studies has demonstrated that delays in language skills are common in children with ASD. However, to what extent these delays affect literacy development remains largely uninvestigated. In this editorial, we will focus on the development of language and literacy skills among children with ASD. (Chen & Kuo, 2017)

ASD has certain characteristics in language and the processes that occur in their brains are characteristic according to the 4th Diagnostic and Mental Disorder statistics Manual Washington, DC: American Psychiatric Press. (1994) autism people have abnormalities in neurodevelopment. This makes their brain function experience problems and cause a decrease in ability in their brain. This means that students with autism with high functioning disorders have language disorders (Specific Language Impires) (Bishop & Norbury, 2002) Diagnosis of Autism Spectrum Disorder is diagnosed as in early childhood often at or before preschool age. Diagnosis is based on documented core disorders related to social interaction, communication, and limited and repetitive behavior (American Psychiatric Association, 2013) due to their language delay process, Child study with Autism Spectrum Disorder has involved overlapping between autism and SLI (Specific Language Impires) (Hodge et al., 2010)

Research shows autism Impaiers have a disorder in greater understanding because it can be found in both language understanding and production. (Belkadi, 2002; Hudry et al., 2010) Brain activation has been shown to reduce the activation of the brain in the prefrontal and temporal brain regions. (Groen, Zwiers, Gaag, & Buitelaar, 2008)

There are clear differences in brain structure between neurotype children and children with ASD (Dawson, 2008)Functional studies have found that the reduction in activation in Broca's area is different from the area of Wernicke.Brocas aread is an area in producing coherence and speech, while the wernicke area helps in processing and understanding language.

Reducing activation in Broca's area can indicate problems that cause pressure in integrating the meaning of words in the sentence, therefore, hinder understanding.Left lateralisation, or specialization, language processing seen in neurotype children can also be reversed in children with ASD(Hodge et al., 2010) They were found to have a larger language area in the right cerebral cortex. Children with high functioning characteristics of autism are usually fluent in speech and have advanced vocabulary, good phonology, and syntax (language rules). Autism high function is a struggle with receptive language, expressive language, nonverbal communication, and pragmatics (the context of soci al- language).As a result, their way of learning in the classroom is affected and they show a certain set of relative academic strengths (eg. Reading decoding, mathematical calculations) and weaknesses (eg, reading ability, math applications, written language). (Lim, 2018)

## **2.2 Cognitive level in reading for ASD**

Cognitive process is the process in the human brain to processes and understand the information that they read or they listen(Waters, 2006)it originate from human activities which have some basis, namely information processing, social cognitive perspective, the developmental cognition theory and also neuropsychological points of view. (Keat & Hj Ismail, 2011) cognitive processes have profiles that are relaxed by intact functions prayed in visual-spatial processing , attention, sensory perception, basic memory skills, associative short- term memory values, and basic language skills (Charmana, Jonesa, Picklesb, Simonoff , Baird, & Happée, 2010) processes of cognition are mental activities consisting of acquisition, organization and use of information (Neisser, 2014; Reed, 2007).

based on (Woolley & Woolley, 2016)the process that occurs in humans there are several levels of cognition processes that are initiated by the model then developed by (Woolley, Reading comprehension: Assisting children with learning difficulties, 2011) the Woolley model proposes a structure consisting of (1) a surface level where the description of words, phrases, and analysis of syntactic languages are sentence structure sensory, (2) a deep level of cognition that seeks semantic coherence, inference construction and situation modeling and (3) metacognitive level or executive function that operates in the background and determines the purpose of reading, the monitor understands and reflects the objectives and learning outcomes (Woolley, Reading comprehension: Assisting children with learning difficulties, 2011) students who have an ASD background

which level of Surface level is low tingkan conitive poses focuses on reading skills and decoding and reading fluently, but often cannot construct the meaning of words, phrases or sentences that are appropriate when reading (Randi et al., 2010)

in its application, cognitive itself has been grouped with the existence of Taxonomy bloom which has been implemented in the Special Need school implementation of taxonomy has been done in schools for children with special needs (LOMBARD & SAVAGE, 1994) for researchers conducting research by evaluating teachers and assumptions in a school on the study said that teaching is a higher level of thinking skills, culminating in student participation in conference planning, with the critical use of questioning, advanced organizations, and cooperative decision making can produce students with special needs to be more independent and better prepared to face challenges at school. Studies about Cognition process in autism have been conducted before in mathematical (1) interpreting: understand every sentence in the problem, (2) recalling: recall of factual knowledge needed to solve the problem, (3) organizing: building a coherent representation of key information in a problem called conceptual knowledge, (4) planning: designing the settlement plan, and (5) producing: implementing a plan called procedural knowledge (Anderson, 2015), but it is still not conducted in reading english.

Research on reading comprehension conducted by autism researchers includes various components in reading word recognition, deciphering words, accuracy of reading texts and understanding texts but still requires research to read literals,

interpret and read critically. There are four levels of reading comprehension based on (Smith, 1978) literal, interpretive, critical and creative. These four levels correlate with the identified cognitive (intellectual) classes (Bloom, 1966). This explanation is described by (Heilman, 1988) literal and is a simple level in this skill. reading only needs to produce facts based on the text. here, further questions about factual data, groupin and chronology, and for making specific samples of pharaprases or questions. Interpretive is the reader needs to find information provided by the author. This level is more necessary to find significant data, make notes of various relationships such as effects and causes based on text, make comparisons and draw concubine conferences and make generalizations. Spiritual is a reader who tends to evaluate and assess information to make qualifications and differences in the point of view of intention and truth. Creative is this level requires the involvement of the reader with the information presented when he uses it to formulate or rethink his own ideas. Questions at this level may consist of open questions that require the reader to enter their own knowledge, views, and values as in a normal child before.

In review previous study based on (Chiang & Lin, 2007) in this research used 13 instruction in reading comprehension for 100 students with ASD background. The instruction based on the NRT (National Reading Panel). Based on the study showed that student with ASD are able to able to acquire the target skill in realtion component in reading comprehension. Second reserach come from (Randi et al., 2010) the aims of this study is to investiage student cognitive skill based on reading comprehension text. The text focused on the academic reading with the

goals are able to build student gaining meaning, rereading and decoding skill. the result of this tudy showed that student with ASD have interventions that deal with certain cognitive processes, such as finding previous events, making and answering questions, finding references, and rereading to improve understanding. Next, Review study come from (Fauziyah et al., 2019) the aims of this study is to investigate student cognitive processes to solving math problem. The subject of this tudy from two students with ASD with High Function. This research devided as four categorizes understanding problems, arranging plans, implementing plans, and looking at data again. The resut showed that student ASD with High Function have different characteristics of students with ASD were very perceptible during mathematical problems solving process. Differences in intelligence of the both subjects had a role in every process of cognition

Based on the statement above, the previous study about the Cognitive process in the Autism Spectrum Disorder with High Function still focus on the Vocabulary instruction, Text Comprehension instruction, comprehension strategies, word recognition, gaining meaning from text and rereading to repair Understanding.

### **2.3 Reading Literacy for Autism Spectrum Disorder**

The development of reading especially reading literacy has same important skill for ASD students because in the future student given the relation between emergent-literacy skills and future reading achievement.(Dyonia, Lawton, Logan, & Justice, 2015) Reading literacy is the ability to understand and distinguish information on the text and then reflect it in the written text. The

ability and incentives to engage with important text and content. (OECD, 2017). The goal of reading literacy is understanding, using evaluating, reflecting on and engaging with texts in order to achieve one's goals, to develop one's knowledge and potential and to participate in society. Reading literacy is defined as the used print write information for social function achieving goals and developing one knowledge and potential. The Cognitive emphasize the interactive Characteristic of reading in the constructive features understanding. (Bruner & Bruner, 1988) Literacy is developed through the specific study of the English language in all its forms, enabling students to understand how the English language works in different social contexts and critically assess writers' opinions, bias and intent, and assisting them to make increasingly sophisticated language choices in their own texts. The English learning area has a central role in the development of literacy in a manner that is more explicit and foregrounded than is the case in other learning areas. Students learn literacy knowledge and skills as they engage with the Literacy and Language strands of English. They apply their literacy capability in English when they interpret and create spoken, print, visual and multimodal texts for a range of purposes. (Australian Curriculum, Assessment and Reporting Authority, 2013)

The previous study, (Elizabeth Lanter, Linda R. Watson, Karen. Erickson, 2012) report that student with ASD have significant delay in language, writing rint functions rather than normally developing. Peer(Dynia et al., 2015) identify delays in the area print-concept knowledge and definition vocabulary, both which is considered knowledge related to meaning. Rather, they also noted phonological



delays awareness, which is related to code. Despite this little inconsistency, the findings from the limited research highlight the challenges that children with ASD face develop literacy skills related to meaning and suggest that a lot of struggles related to literacy faced by these children in developing and processing skills to analyze and obtain mean.

The development of reading literacy is important in the world, to measure reading literacy in the ability of students throughout the world a program called PISA is made. This program is a petrifying program that measures the reading literacy capabilities that exist throughout the world To measure the various dimensions of literacy reading, in PISA it is defined as complex competencies with various facets. Therefore the exercises cover various situations and text formats. Solving reading exercises also requires a variety of cognitive reading processes. The reading problem come from Reading Literacy PISA (Program for International Student Assistance) **2015** which is tasked with measuring Reading Matematic and Reading Science in each country. Every 3 years PISA is held and having different character assessments every year but still in cognitive territory is the most focused point in the study (Thomson, Hillman, & Bortoli, 2013). The researcher use PISA Readsing Literacy because basically all the text is focus in the cognitive concept. There is no diffrences between text every year. It is still measure students cognitive but it has different questions. Then the researchers also used a video recorder as a tool to record student activities. Researchers also use based review (Fauziyah, Gresik, & Lant, 2019). The text will get from OECD website which easy to find and also easy to aces. The text can go with online and

offline but the researcher prefer to do in off line question, it is because the researche only use 3 question based on the text. There are eight levels in PISA Reading Literacy.

The first Level is “**Below 1b**” in this level basically the low levels of Reading Literacy. The second is “**Level 1b**”. Students at this level can find piece of information which is started explicitly in the text. The Third Level is “**Level 1a**”. Students at tis level can classify one or more piece of information, recognise the main theme or writer main purpose in a text a bout familiar context and make simple conection. The fourth level is “ **Level 2**” in this level students can recognise the main idea in the text, undestand the relationship and construe meaning within a limited part of the text when the information is not prominent and the reader must make low level inferences.

The Fifth level is “**Level 3**”. Students at this level can locate, and in some cases recognise the relationship between, several pieces of information, integrate several parts of a text in order to identify a main idea; locate required information that is not prominent or where there is much competing information; demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. The sixth level is “**Level 4**”. Student at this level need to organise several inveterate information. interpret the meaning of nuances of language in a section of text.

The seventh level is “**Level 5**”. Students at this level can organise several pieces of deeply embedded information, inferring which information in the text is relevant; critically evaluate or hypothesise, drawing on specialised knowledge. Eighth level is “**Level 6**”. Student at this level can Make multiple inferences,

comparisons and contrasts, demonstrate a full and detailed understanding of one or more texts; integrate information from more than one text. The reader may be required to deal with unfamiliar ideas in the presence of prominent competing information.

The student need to answer the question from the text the researcher can understand how the cognitive processes. It based on the (Fuzyiah, Lant, Budayasa, & Juniati, 2019).(Snow, n.d.) the data analyzing the problem solving categorized into four categories, understanding the problems, devising a plan, carrying out the plan, and looking back the data. mean while the PISA Reading Assesment Literacy have those categorizes.

The PISA Reading Assessment Literacy design is the following framework and is interpreted according to OECD ( 2017) there are several aspects in PISA Reading Literacy which can support how suitable PISA become support instrument and support this research goal. Aspect are the cognitive skills that reader need to process retrieving information; forming a broad understanding; developing an interpretation; reflecting on and evaluating the content of a text; and reflecting on and evaluating the form of a text.

### 3.4 Previous Study

Reviews of previous research related to the cognition process in students with ASD background in various aspects that have been carried out such as, in the process of mathematics process conducted by (Fauziyah et al., 2019)academic reading with traditional words of understanding (Chiang & Lin, 2007) Reading comprehension and social functions of language to students with ASD processes

of cognition and skills to build vocabulary (Randi et al., 2010) All the theory is described as follows cognition processes that occur in autism spectrum disorder EFL in solving mathematical problems. Based on (Fauziyah et al., 2019) to investigate cognitive processes that occur in students with autism backgrounds. This study was applied to two students with ASD. both diagnoses as ASD at three years of age, IQ scores above 90 and attending secondary school in Indonesia with exposure to the general and inclusive education system. However, every student has experienced inclusive education at various levels during their school. Qualitative data on the general form of words comes from observations, interviews or documents. Qualitative data has advantages compared to quantitative data; for example qualitative data is richer in terms of description and explanation. Instruments for testing mathematical problems are used to collect data about cognitive processes carried out by the subject in solving mathematical problems based on Polya's problem solving procedures. Cognitive processes involve reading and paraphrasing problems, visualizing problems and representing them in the form of pictures or diagrams, determining hypotheses to make plans to solve problems, predicting or predicting answers to problems, completing calculations, and finally checking to make sure the problem solving process produces answers that right. The results of the study show that there are differences in levels of ability. This is most likely due to differences in learning capacity of subjects. Some characteristics of students with ASD are also very clear when they solve problems.

(Chiang & Lin, 2007) to review the study of teaching reading comprehension for students with autism spectrum disorder (ASD) with a focus on understanding text (academic reading) and understanding word vision (functional). NRP (2000) organizes reviews of research on teaching reading comprehension for children in three areas: vocabulary instruction, text comprehension instruction, and teacher preparation and understanding strategies. Instructions (vocabulary) occur when students are able to "match words with images or understanding text objects. In reading, the researcher focuses on "Students' understanding of the text at the sentence level" Understanding of functional texts occurs when participants "carry out behaviors determined by written instructions". These were 11 studies that met the criteria for inclusion including a total of 49 people with ASD. The majority of studies (n = 7) included participants with mental retardation. Three studies included participants with normal IQ or high function autism. Using 13 theories to measure student vocabulary and academic reading. National Reading Panel (2000) identified 13 teaching methods for teaching reading comprehension (5 methods for teaching vocabulary and 8 for understanding text teaching) that represented the most promising general education practices. The methods of teaching vocabulary identified are (a) explicit instructions (i.e., students given definitions of target words), (b) implicit instructions (i.e., students faced with various words), (c) multimedia methods (including others) outside media text, such as graphics, hypertext, or American Sign Language), (d) capacity methods (i.e. practice of making automatic reading), and (e) association methods (i.e., students make

connections between words they know and words they know) don't know). Learning methods for understanding the texts identified are (a) monitoring comprehension, (b) cooperative learning, (c) graphs and semantic organizers, (d) story structures (i.e. students asking and answering questions about plots or mapping timelines and events in the story), (e) answering questions, (f) generation of questions (i.e., students asking themselves questions), (g) summarizing, and (h) multi-strategy teaching (i.e. students using multiple strategies flexibly in all text). The study authors included in this review report that participants with ASD obtained targeted skills in relation to the reading comprehension component.

(J, C. R. G. , & Charman, 2015) to investigate world recognition for ASD in reading the Understanding text. In fact, my students with ASD have difficulty in word recognition and reading comprehension is more common. Researchers measured IQ, reading comprehension, social cognition, social behavior and communication and ASD student language. The Wechsler Intelligence Scale is abbreviated (WASI; Wechsler, 1999) provides a measure of IQ performance. Subtest Reads the Basics of Reading Dimensions Wechsler's Purpose (WORD; Rust, Golombok, & Trickey, 1993) provides a measure of word recognition. The computer version of the Grammar Acceptance Test (TROGE; Bishop, 2005) is used to obtain standard scores for receptive grammar. For social and communication Social scores and joint communication from the Autism Diagnostic Observation Schedule-Generic (ADOS-G; Lord et al., 2000). For social cognition, participants are read a series of narrative texts and each story followed by a question assesses the ability to deduce the intention behind

nonliteral speech. Stories and questions are presented in written form to be followed by participants, if desired, while the experimenters read aloud the text. Based on the article, this study found that ASD has a unique prediction of reading comprehension, this is based on a simple view of the readings found namely word recognition and oral language. ASD also has behavior and measures behavior using indications of social disturbance and communication or cognitively uses two measures of understanding mental stages.

(Randi et al., 2010) the goal of this review study is to examine what makes reading to understand especially challenging for children on the autism spectrum, most of whom are skilled in decoding and lacking in understanding . This paper first summarizes research on reading comprehension with a focus on the cognitive skills and processes involved in getting meaning from the text and then reviewing the study of deficits in reading comprehension in children on the spectrum. This paper concludes with a review of understanding reading interventions for children on the spectrum. These children can specifically benefit from interventions that deal with certain cognitive processes, such as finding previous events, making and answering questions, finding references, and rereading to improve understanding.

