A Neurolinguistic View of Language Development in the Context of Early Childhood Education

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A Neurolinguistic View of Language Development in the Context of Early Childhood Education

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ABSTRACT

One of the organs of the human body that functions to control all movements and body functions, including language, is called brain. However, where exactly the language is located and processed in the brain is yet unidentified. This paper, therefore, particularly discussed the relationship between language and the brain. This article was fully based on a library research approach therefore it is hard to explain what and how exactly language develops in the human brain in relation the early childhood education. The analysis showed that the content of thought which any normal human beings stated and expressed in the form of signs or in words both spoken and written, indicated the existence of a strong reciprocity between the brain and the language development. It further showed that in order for children to think clearly and precisely, the use of the right words is required. Likewise, the use of the right words is very helpful for thinking straight and correctly. The result of the research is expected to provide a new insight about the reciprocal relationship between human brain and the language development in the context of early childhood education.

Keywords: **Neurolinguistik, neuroscience, perkembangan bahasa, pendidikan anak usia dini**

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INTRODUCTION

One of the organs of the human body that functions to control all movements and body functions, including language, is called brain. But where exactly the language is located in the brain is yet unidentified although many researches have been done. This paper discussed the relationship between language and the brain. In particular, this research is covered in the field of Neurolinguistics and Neuropsycholinguistics. However, the discussions are more related to the science of Neurolinguistics.

Neurolinguistics is a new science as a collaboration between Neurology, Medical Science (medicine) which studies the nervous system and its diseases, with linguistics, the study of natural language. This collaboration arises because it turns out that speech disease is a field of neurology as well as linguistics. So neurolinguistics, as a new science, studies the structures in language and speech and the mechanisms of the cerebellum (brain structure) that possess them. (Simanjuntak 1990: 21).

The development of human language is closely related to its biological development. The growth of language in humans follows the schedule of genetic development so that the emergence of a language cannot be forced. Also very important in language acquisition is the neurological factor, namely the relationship between the human brain and language. The structure

and organization of the human brain to provide a light on the problems of acquiring, understanding, and using language. in

This paper further discussed the consequences that would happen when there is a disturbance in the brain. The naturalization process or usually called as the brain maturation process starts from the right side of the brain and gradually moves to the left side of the brain. Around the age of 5, the process of lateralization or brain maturation is over. However, there are experts who describe that the lateralization process ends at a limited age. The child's ability to form complex language rules, construct spoken grammar and grammar, and do all things in a relatively short time is indeed an amazing phenomenon. Efforts to understand human cognitive abilities have been started since the ancient. One of the means to examine mental abilities and processes in human is to examine the language. Therefore this paper discussed two main issues about the relationship between brain and language development in human being. The issues covered were the definition of brain, its function and the relationship of brain and language development at the early age of normal children.

LITERATURE REVIEW

Definition of Brain and Language Development

The brain is one of the organs whose function is very vital for humans. The brain consists of several parts with their respective functions. Each part of the brain has a specific task that affects the working system of various organs of the body.

The brain is one of the most complex organs in the human body. This organ is composed of a number of supporting tissues and billions of interconnected nerve cells. The brain is protected by a covering called the meninges and skull bones, and is connected to the spinal cord.Together with the spinal cord, the brain acts as the body's control center and composes the central nervous system (CNS). This nervous system then works together with the peripheral nervous system to give humans the ability to carry out various activities, such as walking, talking, breathing, to eating and drinking.

Language is the ability to communicate with other people. In this sense, all ways to communicate are revealed, where thoughts and feelings are expressed in the form of symbols or symbols to express something understanding, such as by using spoken, written, sign, number, painting, and facial expressions. (Yusuf, 2007: 118). According to Suntrock (2007:353) Language is a form of spoken, written, or sign communication based on a system or symbols. Language consists of the words used by the community along with the rules to arrange various variations and combine them. Bromley (in Dhieni, 2009: 1.11) defines language as an orderly symbol to transfer various ideas and information consisting of visual and verbal symbols. Visual symbols can be seen, written, and read, while verbal symbols can be spoken and heard. Children can manipulate these symbols in various ways according to their thinking abilities

Brain and Human Development

According to Whitaker, in (Cahyono, Bambang Yudi, 1995: 258) the determination of certain areas in the brain in relation to language is based on three main evidences. The first evidence is that the elements of language skills do not occupy the same parts of the brain.

Language skills (speaking, listening, reading, and writing) and linguistic structures (syntactic and semantic features, lexical and grammatical forms) have distinctive areas in the brain. Second evidence is that everyone's language occupies the same area in the brain. The third evidence is that there is a relationship between language ability and the hemispheres of the brain. From the above opinion, it is concluded that the brain is not a single lump of neural network having the same task in all parts of the brain that support all human actions. Different regions of the brain have different structures and each structure contributes to each human behavior. In more detail, it will be explained that the brain plays a very important role in language. People it's been a long time talk about the brain and language. Aristotle in 384-322 BC had spoken of the heart doing the things we now know the brain does. Likewise the famous painter Leonardo da Vinci in the 1500s (Dingwall 1998; 2001). However, the common starting point is after the discoveries made by Broca and Wernicke in the 1860s. From the structure and organization of the human brain, it appears that the brain plays a very important role in language.

If the input is in spoken form, then the sound is responded to in the temporal lobe and then the input is processed. After that, the sound is sent to Wernicke's area to be interpreted and the sound is sorted into syllables, words, sentences and then its meaning is understood. If this sound is in the form of information that does not need to be responded to, it is simply stored in memory. However, if a verbal response is needed, the interpretation is sent to Broca's area via the arcuate fasciculus.

The naturalization process or brain maturation process starts from the right hemisphere of the brain and gradually moves to the left hemisphere of the brain. Around the age of 5 years, the process of lateralization or brain maturation is over. However, there are experts who describe that the lateralization process ends at a limited age. A child's ability to form complex language rules, construct spoken grammar and sign grammar, and do all of the above in a relatively short time is indeed an amazing phenomenon. Attempts to understand the complexities of human cognitive abilities have been around since ancient times.

One of the means to examine mental abilities and processes is to examine language. According to Whitaker, the determination of certain areas of the brain in relation to language is based on three main pieces of evidence. First, the elements of language skills do not occupy the same part in the brain. Language skills, such as speaking, listening, reading, and writing, and linguistic structures such as syntactic and semantic features, lexical and grammatical forms, have distinctive areas in the brain. The second is that everyone's language occupies the same area of the brain. Third, there is a relationship between language skills and the hemispheres of the brain (Stemmer and Whitaker, 2008).

METHOD

This research was designed as a library-based research. The premise is that the research design reflects priority made for a research process (Bryman, 2004) which means that the framework selected needs to provide a systematic direction for the research.

This research used a descriptive qualitative design (Licthman, 2010: 12-19 and Ruslin, 2017: 119; Ruslin et al, 2022). The library research approach allows the researcher to examine and narrate data related to concepts, thoughts and rules regarding the issues being investigated.

The study employed library resources to collect data regarding the issues and practices of reading amongst high school students (Zed, 2004: 2-3). The data were derived from different resources which could be in the form of books, journals, proceedings, and handbooks that are relevant to the issues being investigated. Data collection was carried out through a process of conceptualizing and observing various phenomena in neuroscience and language development.

FINDINGS AND DISCUSSION

The fact shows that the human brain is not simply a lump of neural network that has the same task in all parts of the brain which supports all human actions. Different regions of the brain have different structures and each structure contributes to each human behavior. In more details, it could be explained that the brain plays a very important role in language formation in human being.

Based on the neuroscience, the human brain weighs 1300 to 1400 grams, but contains about 100 billion neurons (nerve cells) (see Petito et al, 1987). The mind is a collective activity of the parts or brain regions. To understand the human mind, one must know the activities of the brain regions. According to Chomsky, knowing the activities of these brain areas allows us to better understand that the essence of language is a unique and separate component of the mind (Behme & Deacon, 2008).

Broadly speaking, the human brain system can be divided into three, namely (1) the cerebrum, (2) the cerebellum, and (3) the brain stem. The most important part of the brain in language activities is the cerebrum. The cerebrum is directly involved in language processing is the cerebral cortex. The cerebral cortex is the part that looks like white lumps and is the largest part of the human brain system. This section regulates or manages cognitive processes in humans, one of which is language (Behme & Deacon, 2008).

The cerebral cortex consists of two parts, namely the left hemisphere (left hemisphere) and the right hemisphere (right hemisphere) (Taylor and Heilman, 1980). The right hemisphere controls the processing of spatial and visual information (seeing, estimating, or understanding space or objects in three dimensions). While the left hemisphere controls language activities, besides of course other cognitive processes. Coordination between the two is possible because of the structure that unites the two hemispheres, namely the corpus callosum. This cartilage-like structure plays a role in conveying information between the two hemispheres.

The understanding of the brain, the parts, the functions, and the language development processed therein allows the educationists, teachers, practitioners in the field of childhood education to better design a curriculum of the early education. It also helps the teachers of early childhood education adjust teaching and learning materials, strategies, approaches, and media needed for teaching the under five year-groups. The inclusion of technological devices in the early childhood education currculum might be a good start for teachers and all the stakeholders to consider if the effective early learning is to achieve.

CONCLUSION

It has become the nature that language is one of the gifts of The Almighty God, Allah SWT that allows humans to manage their thoughts and control outside influences on their minds. Thinking may be understood as talking to oneself inside and the other person does not know what somebody else is thinking about until expressed. However, if what you think is to be told to others, then the content of thought must be stated and expressed in the form of signs or in words. Language, both spoken and written, is a tool for expressing ones' thoughts. Between thought and language, there is a strong reciprocity. Thinking clearly and precisely requires the use of right words. Likewise, the use of the right words is very helpful for thinking straight and correctly. Language is like a tool of thought, if it is really mastered and used properly, it will be very helpful to acquire knowledge and skills for lives.

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