NEUROSCIENCE LEARNING IN EARLY CHILDHOOD EDUCATION

Naily Inayatul Maghfirah,
Siti Rohimatus Zainiyah,
Musdalifatul Mukarromah,
Nurul Qomariah,
Yayuk Masruroh,
Marwati

Islamic Institute of Al-Qodiri Jember
atusazzainiyah@gmail.com

Abstract

Neuroscience is a science that studies the nervous system of the human brain. The main focus of neuroscience involves understanding how brain cells communicate. Research in neuroscience has broad implications, from understanding nerves to applications in education. Neuroscience in early childhood education is a field of research that explores the link between children's brain development and the learning process. In the Al-Qur'an there are many explanations about the brain's function for thinking with the word aql. The urgency of character education in early childhood in neuroscience can be seen from the relationship between environmental stimulation and children's brain development. By providing integrated character education, we can create an environment that supportsbrain and character development in early childhood.

Keywords: neuroscience learning, early childhood education

INTRODUCTION

Early childhood is children in aged 0-6 years. At that age, development occurs very rapidly. Early age is considered so important that it is called the golden age. Every individual experiences early age, it's just that early age only occurs once in each human's life phase, so the existence of early age should not be wasted. Early age is the most appropriate time to stimulate individual development. Muliana stated that in order to provide various development efforts, it is necessary to know about the developments that occur in early childhood.

Neuroscience is a new educational system that studies the nervous system. Educators generally rarely pay attention to this problem. Neglect of this system causes the learning atmosphere to become dead. In the world of education, after researchers researched neuroscience, a debate between two camps emerged, separating and uniting the three elements (brain-mind, soul-body, mind-heart) and yet to find common ground. Wathon (2020: 136) said that the most systems prohibit students from using their brains and minds in learning, so far students are only required to maintain a noble heart and noble morals.

Character education given and stimulated from an early age will have a positive effect on growth and development and personality. The importance of character education given from an early age will influence later life patterns. This opinion is in line with Piaget who explained that there is a golden age for children which is the highest period of children's development. Based on Solichah This is important because this period is a time when children can be directed to do good things according to their parents' habits and character.

RESEARCH METHOD

Several concepts which become the theoretical basis for this research is the definition of early childhood education and the definition of neuroscience, they are:

1. Definition of Early Childhood Education

Education is a guidance educator by the physical and spiritual development of students towards the formation of a primary personality, stated by Saputra (2018:182). Education is one of the most important factors in determining the quality of a nation, education is a form of developing a person's abilities and personality that will bet he last a lifetime. In the article 1 of the Republic of Indonesia Law No. 20 of 2003 states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self- control, personality, intelligence, morals and state. Robingantih said that education is the responsibility of various parties to help the growth and development process take place optimally according to the stages of development.

Early childhood education in the 2003 National Education System Law article 1 paragraph 14 states that: early childhood education is a coaching effort aimed at children from birth to age. Saptra also stated that 6 years which is carried out through providing educational stimulation to help physical and spiritual growth and development so that children are ready to enter further education. Early childhood education can also be known as a form of service as a means of meeting educational needs, stated by Ulfah.

2. The Definition of Neurosains

Etymologically, neuroscience is neural science which studies the nervous system. Primarily studying neurons or nerves with a multi-disciplinary approach, while neuroscience in terminology is a field of science that specializes in the scientific study of the nervous system. W a t h o n s a i d t h a t The goal of neuroscience is to study the biological basis of every behavior, meaning that the main task of neuroscience is to explain human behavior from the perspective of activities that occur in the brain.

Neuroscience is a science that studies the nervous system of the human brain. Apart from that, neuroscience also studies consciousness and brain sensitivity in terms of biology, perception, memory, and its relationship to learning, it stated by Susanti.

FINDINGS AND DISCUSSION

1. Neuroscience in Early Childhood Education

There is a strong reason why (Early Childhood) PAUD must be brain friendly, because a newborn child's brain has 100-500 billion neurons (nerve cells). At the age of the first four months, fetal neuron development reaches 200 billion, this is a catastrophic number. However, half will die within a month. Suyadi et al stated that Neuronal death, which reaches 50%, is caused by their failure to connect in other ways, especially the developing embryo. At the age of 2 years, neuronal development reaches 75% and at the age of 5 years it reaches 90%. If at the age of 10 years the child's brain development reaches 99%, after that age the child's brain development becomes slower so to reach 100% you need to wait until the age of 18 years.

In very rapid conditions of development, complex stimulation is needed to help accelerate the development of brain fibers in children. In early childhood education, the most rapid brain development occurs from the fetus to the age of 8 years, where brain development at an early age reaches 80% of an adult's brain, so educational stimulation is needed that is intelligent and enlightening at this age. One of them is by innovating brain-friendly PAUD based on neuroscience. There are several elements based on Suyadi et al for institutions that will innovate to become brain-friendly PAUD based on neuroscience, they are:

a. Developing teacher competencies, especially pedagogical competencies with a neuroscience perspective.
b. Development of a PAUD curriculum that is designed according to brain development and implemented flexibly according to the characteristics of the students' brains.
c. Developing neuroscience-based learning media, one of which is by making puzzles from perceptual images that have been studied in psychology.
d. Develop evaluation models to discover the uniqueness and blessings of students' brains.

In the process of applying neuroscience in early childhood education, it is the brain that enters information into a container that previously contained related information, thereby fostering restructuring, organization and assessment. Apart from teachers, parents also need to understand neuroscience theory, because parents are children's first teachers. In theory, the formation and development of basic brain cells is largely influenced by parents and the environment. Neuroscience is defined as a science that specifically studies and examines the nervous system or neuron system in humans. Neuroscience is closely related to these metacognitive skills through the stages of emotional regulation, awareness, monitoring cognitive processes. Susanti stated that brain ability-based learning (neuroscience) is learning that is connected to the brain which is naturally designed for learning. In neuroscience, children's brains at this age have passed the sensitive or golden age. Neurostorytelling can develop a child's brain potential because this story contains the n-Ach "virus" which is very motivational, full of wisdom and wisdom and free from mystical and sexual elements. Likewise, Islamic Neurostorytelling consists of two forms, it stated by Suyadi (2018: 52)

2. Neurosains in Islam

Neuroscience has traces in the Al-Qur'an surah Al-alaq verses 15 and 16 which means:

Artinya: ketahuilah, sungguh ika dia tidak berhenti (berbuat demikian) niscaya kami tarik ubun-ubun orang yang mendustakan lagi durhaka (Q.S. Al-alaq:15-16)

The meaning by the term nasiyah (forelock) in the verse mentioned is a term found to refer to the brain. In the Qur'an there are many explanations about the brain's function for thinking with the word 'aql. The Qur'an also instructs humans to think in various terms/*lafadz*, such as: tafakkur, nazar, tabu'ur, tadabhur, tafaqqah, tadakhur, i'tibar, ta'aqul and tawassum. This shows that thinking has different levels of depth, stated by Suyadi et al.

In the history of the word, the term "brain" did not appear in the 7th century AD or when the Koran was revealed, so the Koran uses a general term that is understood by the public, namely nasiyah or forelock. Suyadi said that In the Koran, there is not much discussion about the biological organ called nasyiyah or the brain, especially the prefrontal cortex. The Koran talks more about the brain's function for thinking with the word 'aql.

3. The Urgency of Early Childhood Character Education in Neuroscience

Islamic education approach in forming the character of early childhood is very important so that the potential that students have in various learning activities can be achieved in a pleasant, comfortable and happy environment. Apart from that, the neuroscience curriculum also instills values that shape character, artistic values, cultural values, intelligence, skills and religion. With this in mind, neuroscience is based on revelation as a transcendental area that is rational, empirical and intuitive. The only science that studies the brain is neuroscience, so education must involve neuroscience in it, stated by Suyadi.

The rapid development of the brain coincides with the child's physical growth. For this reason, parents must provide stimulation so that children can grow and develop optimally. A child's brain already has billions of nerve cells start from new born. but many of these are lost after birth. When the brain gets a new stimulus, the brain will learn something new. This stimulus will cause nerve cells to form new connections to

store information. The cells used to store this information will expand and can also produce hormones needed for child development. Continuous stimulation given regularly will strengthen the connections between the nerves that have been formed so that brain function will automatically get better. Stimulation given from an early age will also influence a child's brain development. This form of stimulation can be given in an easy and simple way. Parents can provide stimulus with love, appreciation, understanding and attention by paying attention to the age phase of the children. Apart from that, stimulus can also be done through direct experience using the five senses, providing a good example to children, because children will learn from what they see and hear.

a. The Character of education values

Character education is a conscious effort made to help people understand, care about, and implement core ethical values. someone who has character as a person's natural trait in responding to situations morally by prioritizing universal values such as honesty, responsibility, respect, cooperation. to shape a person's personality in order to achieve plural awareness so that the final goal is that everyone with character can live together and side by side and with differences by prioritizing an attitude of mutual cooperation and respect. For this reason, character education requires the sensitivity of everyone from various scientific disciplines to work together to create down-to-earth character. character as an effort made to instill intelligence in thinking, appreciation in the form of attitudes, and experience in the form of behavior that is in accordance with noble values, they are Religious and cultural values are implemented in daily life, both in relation to the Almighty Creator, in relation to humans and in relation to the natural world, thus enabling humans to become caretakers of the natural world who can live in mutual respect and complementarity. In Article 3 of the National Education System Law Number 20 of 2003, it is explained that national education functions to develop and shape the character and civilization of a dignified nation in order to educate the life of the nation, aiming to develop the potential of students to become human beings who believe and are devoted to God Almighty, have noble character, be healthy, knowledgeable, capable, creative, independent and become democratic and responsible citizens. Cultivating the character of every human being will be easier if it is carried out from an early age through habituation and exemplary approaches by parents, educators and caregivers, through words, attitudes and actions. It is carried out continuously and adjusted to the child's age and brain development.

b. The Process of Character Formation in Early Childhood

The formation character is very influential. In ages 0-4 years cognitive development reaches 50%, this age is called the golden age. Ages 4-8 years are 30% and ages 9-17 years are 20%. What is seen, heard and learned will take root and shape the child's perception of the life they experience. If children at this age are raised with love, appreciation and empathy, then what they experience will be engraved and rooted into character. However, if what is seen, experienced and felt is something painful and unsafe, it will form a character that is easily discouraged, unstable and stubborn. For this reason, the role of the closest people, namely parents, plays a role in shaping the

child's personality. The family environment (parents) is a factor in forming character education. Parents' belief in something they believe in regarding truth and error is a factor that forms a child's character. If parents believe in something that is considered true.

For this reason, it is important for parents as the first educators to instill positive beliefs in their children so that they grow into positive and strong individuals. The next environment that influences character formation is the surrounding environment, such as school, play environment, extended family, television, books and the internet. Information obtained from this second environment will enable the conscious mind to analyze and reason. So that it further strengthens a person's character. The urgency of children's growth and development is an inseparable part. For this reason, parenting and teaching patterns for children must be carried out at every phase of the child's development so that the child can grow and develop according to the age stages and can build the child's character from an early age and will develop it until adulthood.[17]

CONCLUSION

Neuroscience is a science that studies the nervous system of the human brain. Apart from that, neuroscience also studies the awareness and sensitivity of the brain in terms of biology, perception, memory, and its relation to learning. The brain is a central nervous system that functions to regulate all life activities. At the age of the first four months, the development of fetal neurons reaches 200 billion, this number which is cataclysmic. At the age of 2 years the development of neurons reaches 75% and at the age of 5 years it becomes 90%. If at the age of 10 years the child's brain development reaches 99%, after that age the child's brain development becomes slower so to reach 100% you need to wait until the age of 18 years.

This is closely related to character education, neuroscience curriculum as well as instilling values that shape character, artistic values, cultural values, intelligence, skills and religion. For this reason, it is important for parents and educators to instill positive beliefs in children so that they grow into positive and strong personality.

REFERENCES

Perkembangan Anak Usia Dini." *Jurnal GoldenAge Hamzanwadi University* 3, no. 1 (2018): 1–12.

Saputra, Aidil. "Pendidikan Anak Pada Usia Dini." At-Ta'dib : Jurnal Ilmiah Pendidikan Agama Islam 10, no. 2 (2018): 192–209.

Sholichah, Aas Siti. "Urgensi Pendidikan Karakter Pada Anak Usia Dini Dalam Tinjauan Neurosains." JECIES: Journal of Early Childhood Islamic Education Study 1, no. 1 (2020): 01–14.

Susanti, Salamah Eka. "Pembelajaran Anak Usia Dini Dalam Kajian Neurosains." *TRILOGI: Jurnal Ilmu Teknologi, Kesehatan, Dan Humaniora* 2, no. 1 (2021): 53–60.

Suyadi. "Kisah (Storytelling) Pada Pembelajaran Anak Usia Dini Dalam Kajian Neurosains Pendidikan Islam." Jurnal Ilmiah *Islam Futura* 18, no. 1 (2018): 52–74.

Suyadi, Sumaryati, and Dwio Hastuti. *Inovasi Pendidikan Anak Usia Dini.* Yogyakarta: UAD PRESS, 2020.

Ulfah, Robingantih & Zakiyah. *Pengembangan Bahasa Anak Usia Dini.* Yogyakarta: Arruz Media, 2020.

Wathon, Aminul. "Neurosains Dalam Pendidikan." Journal of Early Childhood Islamic Education Study 1, no. 1 (2020): 136–45.