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Neuroscience In Islamic Religious Education Learning

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Abstract: In the world of education, many discoveries state that humans have not maximized in using the potential of their brains, such as creating new ideas or solving problems. So, this study aims to describe and analyse the relevance of neuroscience in PAI learning and what role neuroscience plays in PAI learning. The methodology applied to this research is a descriptive qualitative method approach, and this research is a type of library research, which is a research based on the source of books, papers, articles, journals and other scientific works that support this research. The results of this study show that neuroscience has a close relationship with PAI learning, where in the implementation of learning neuroscience is needed so that learning can run smoothly and effectively, where neuroscience can help PAI teachers understand better how students' brains process information and learning materials so that teachers can develop varied teaching strategies and come up with the latest innovations in learning. Neuroscience plays an active role in PAI learning to improve students' cognitive development.

Keywords: Islamic Religious Education, Learning, Neuroscience.

A. Introduction

Education is essentially the optimization of all potential or intelligence that humans have. Education itself is a medium in fostering personality and developing human potential (Mayasari 2017; Supriandi, S., et al., 2022; Hidayat, F. N., et al., 2023) The centre of all human potential lies in the brain, and one of the efforts that can lead students to arrive at the optimization of brain potential is neuroscience learning theory (Wahid 2022) Therefore, it is necessary for education to include neuroscience in learning.

Many discoveries obtained from research state that humans have not maximized in using the potential of their brains, such as creating new ideas or solving problems. This happens inseparably from education that does not know the brain so that education is not able to carry out its main task, which is to change, develop, optimize brain potential. This is because the applied education system focuses on the left outer

brain. Which is more dominant in academic learning. While the right brain focuses on art, and creative imagination has not been developed proportionately. If the work of the brain is done in a balanced manner, it will produce certain creativity in the brain. (Nugraheni, Husain, and Rohani 2022; Afita, L., & Nuranasmita, T. 2023) The brain has a great ability to store information or rearrange the information in different ways so that new ideas emerge.

Neuroscience studies the consciousness and sensitivity of the brain in terms of biology, perception, memory, and its relation to learning. The challenge faced is how to apply the education system that allows optimization of the entire brain so that the reception, management, storage, and use of information occurs in an integrated manner. If referring to the definition of education listed in the national education system, there should be no more misunderstanding of the brain. (Dewi, Fitri, and Soviya 2018).

In fact, humans must use their intellect to understand all knowledge and knowledge handed down by Allah SWT. As an appreciation of the existence of reason in man, Allah Almighty made man a caliph on His earth. (Khotimah and Suyadi 2023). In the field of education itself, neuroscience has produced several theories in quantum learning, such as accelerated learning, quantum learning, brain-based learning, and others. This proves that neuroscience has traces in education (Muhimmah and Suyadi 2020)

Based on the explanation above, it is known that the need for neuroscience in education because it cannot be separated from each other. Therefore, it is necessary to conduct research that discusses the importance of neuroscience in education and its relationship with learning Islamic religious education

B. Methods

The method used in this research is a descriptive qualitative approach. This research using a qualitative descriptive approach uses library research in conducting its research. Bungin stated that library study is research carried out in libraries, where researchers deal directly with various kinds of literature according to the objectives and problems in question (Bungin, 2001). Meanwhile, Nazir said that literature study is a data collection technique by conducting a review study of books, literature, notes and reports that are related to the problem to be solved (Nazir, 2003). Because this research is a literature study, the data sources used are the following, including: books, journals, magazines, newspapers, various reports and documents (both unpublished and published). Library data can also be in the form of non-printed works such as audio recordings such as cassettes, and video films such as microfilm, microfiche and other electronic materials such as diskettes or magnetic tapes and

electronic cladding (cartride) related to computer technology (Zed, 2014). The data is sorted according to the objectives and problems of this research.
Then Cresswel also revealed that analysis using qualitative descriptive includes data reduction, data presentation, and interpretation and drawing conclusions to answer problems in the research (John W Cresswel, 2015).

In this research, the author uses library sources more to achieve maximum research results and does not apply field research. The author chose this method because in the author's perspective this method is one of the separate stages that the author carried out, namely preliminary research to understand in depth the urgency and relevance of neuroscience to Islamic religious education learning and what role neuroscience plays in the world of learning. (Djam'an Satori and Aan Komariah, 2010).

C. Results and Discussioon

Understanding Neuroscience

Neuroscience etymology is a neural science that studies the nervous system, especially studying neurons or nerve cells with a multidisciplinary approach (Maryanti and Kurniawan 2017). In terminology, neuroscience is a field of science that specializes in the scientific study of the nervous system. With this basis, neuroscience is also referred to as the science that studies the brain and all the functions of the back nerve function. (Aminul Wathhon, 2015).

Neuroscience is a field of study of the nervous system in the human brain. Neuroscience also studies the consciousness and sensitivity of the brain in terms of biology, perception, memory, and its relation to learning. (Rois et al. 2023) The nervous system and brain are physical parts of the human learning process. The study of the brain became a cornerstone in the understanding of how humans feel and interact with the outside world and in particular what humans' experience and how humans affect others (Salamah Eka Susanti, 2021).

From the explanation above, it can be concluded that neuroscience is a branch of science that studies and studies how the brain and nerves work in humans so that they can optimize the potential of the brain in order to increase understanding of what is in humans.

The main goal of this science is to study the biological underpinnings of any behavior. That is, the main task of neuroscience is to explain human behavior from the point of view of the activity that takes place inside his brain (Aminul Wathhon, 2015). In reality, the brain has a very important role in cognitive, affective, and psychomotor regulation, including IQ, EQ, and SQ. With maximum utilization of brain potential, the development of cognition, affection and psychomotor domains can be done more

optimally because these three domains are very important in building human attitudes and behavior (Rachmadyanti 2017). It is on this basis that neuroscience is called the science that connects the brain and mind (brain-mind connection) or soul and body, including the heart and reason.

Scope of neuroscience

As mentioned earlier, neuroscience studies humans as a whole or science that studies humans interdisciplinary. In addition, neuroscience also describes that the human brain has wonders, namely the center of intelligence, consciousness, creativity, thinking, as well as the center of receiving information of our five senses. In fact, brain control and regulation include all organ systems (such as blood circulation, oxygen circulation through breathing, intestines, lungs, kidneys, liver, and others) (Astuti budi handayani, 2019). Neuroscience has several dimensions, including: (Aminul wathon, 2015).

a. cellular-molecular

This cellular-molecular study studies a wide variety of nerve cells and how they perform specific functions that differ from one another to produce a variety of complex behaviors, such as emotions, cognition, and actions. In short, these three are emotions and ratios that become a unity in the neural network of common sense.

b. Nervous System

The field of the nervous system examines nerve cells that function similarly in a complex system. For example, vision problems are studied in the "visual system"; movement problems are studied in "isotonic systems" or kinesthetic systems; hearing problems are assessed in the "auditory system"; and so on.

c. Behavioral Neuroscience

Behavioral neuroscience examines how the various nervous systems working as mentioned above work together to produce certain behaviors. For example, how the visual nerve, auditory nerve, motor nerve process information (subject matter) simultaneously (although only one of the dominant ones).

d. Social Neuroscience (Socioscience)

This field studies how the human "social brain" plays a role in helping humans form relationships with others. The ability of humans to establish relationships with others is their nature that is stored biologically in the brain. Although not a localized and

easily identifiable system, the "social brain" has deep roots in the interaction between the various parts.

In neuroscience, the brain is analysed from two sides, namely structurally and functionally. Neuroscience, specifically studies the function and structure of the brain as part of the structure that makes up living things. Studying brain function means studying the last part of the functioning of living things that is very complex, because it has implications for all facets of human life, from the atomic level to the community level and even the global aspect (Astuti budi handayani, 2019).

Exploration of the brain during the brain era (Brain era) namely 1990-2000 succeeded in demonstrating the fact that the brain provides anatomical components for rational aspects (Intelligence Quotient = IQ), emotional aspects (Emotional Quotient = EQ), and spiritual aspects (Spiritual Quotient = SQ). As it is known that in one head there are indeed three ways of thinking, namely rational, emotional, and spiritual. Recent discoveries in neuroscience are increasingly proving that certain parts of the brain are responsible for organizing types of human intelligence. There are at least nine intelligences: linguistic, logical mathematical, spatial, body-kinesthetic, musical, interpersonal, intrapersonal, naturalist, and existential. (Sharifah 2019) In addition, there are still three important intelligences, namely: naturalist, existential, and spiritual intelligence. Although the exploration has been done amazingly, there are still many mysteries that have not been revealed. From what has been revealed, 10 Basic Laws are formulated as follows: (Hengki Wijaya, 2018).

a. The brain stores information in its nerve cells.
b. The brain has components to create habits in thinking and behaving.
c. The brain stores information in the form of words, images, and colors.
d. The brain does not distinguish facts and memories. The brain reacts to memories exactly the same as it reacts to facts.
e. Imagination can strengthen the brain and achieve whatever it wants.
f. Concepts and information in the brain are arranged in the form of patterns.
g. Sensory apparatuses and nerve receptors connect the brain with the outside world. Sensory exercises and physical exercise can strengthen the brain
h. The brain never rests. When the rational brain is exhausted and unable to complete the work, the intuitive brain will continue
i. The brain and heart try to be close. The brain that is honed continuously will become wiser and calmer.
j. Brain power is also determined by the physical nourishment the brain receives.

Neuroscience in Islamic Education

Neuroscience is the science of the brain or the science of thinking, including critical and creative thinking, in an effort to produce innovative and credible work. Until now, Islamic education has not studied scientifically the science of reasoning, except mantiq

(logic) which is still philosophical. So Islamic education alone is not enough to develop critical and creative thinking. Therefore, in this millennial era, neuroscience should be added as a foundation for critical, creative, and innovative thinking. (Suyadi, 2019: 185)

Based on what has been explained above that neuroscience is a science that studies the brain and the nerves behind it so that it can maximize all the potential of the brain. In the world of education, learning success is not only influenced by internal factors such as interests and talents or external factors such as the school environment, but other factors such as neuroscience also have significant implications in the educational process because by better understanding neuroscience, the process of transferring knowledge to students can be more effective.

Learning outcomes can be grouped into two types, namely knowledge and skills. Learning with neuroscience methods is a process to obtain behavioral changes from negative to positive so that learning objectives are achieved. Therefore, learning outcomes look at the ability of students in aspects of knowledge, skills, attitudes and values that are manifested in daily habits (Citra Tisna Dewi, 2018; Ramli, M. 2023). Neuroscience is also found in the Qur'an which describes brain activities, such as *tafakkur* (thinking), *tadabbur* (contemplation), *tabaṣṣur* and understanding. The meaning of the sentence is constructed creatively (meaning of creatifity), as the Qur'anic verse uses the term neuroscience. Therefore, neuroscience in Islamic education allows it to be integrated (Citra Trisna Dewi, 2018).

Neuroscience studies have not been given much attention in Islamic education at this time, while the educational process is an activity that always goes hand in hand with optimizing the potential or work of the brain. In the educational process, including Islamic education, it is necessary to pay attention to the findings in the field of neuroscience so that it can have a significant influence on the quality of education. Integrating neuroscience studies in Islamic education can lead educational actors in analyzing appropriate methods and the use of media to be able to involve all parts of the brain, both rational, emotional, and even spiritual. The concept of integrating neuroscience with Islamic education, has an impact on optimizing all types of intelligence. However, what is happening now is that there has been no serious attention from Islamic education to neuroscience, so there is a separation between types of intelligence (IQ, EQ, SQ) (Riskawati saleh, 2023).

Islamic religious education is a process in which a person or group of people through education consciously want to transform knowledge, good values, and skills from time to time. (Ramli 2015) The main function of educators in general is to transfer knowledge and transform values and norms to students so that a sholeh (Ramli 2015). Islamic religious education is an effort to prepare students to understand, believe, and practice the teachings of Islam from the main sources, namely the Qur'an and Al-

Hadith. It can be done with teaching activities, exercises, and experiences. From this understanding, it can be understood that the purpose of Islamic religious education is to increase understanding of Islamic teachings, practice them, and strengthen the practice of Islamic teachings in everyday life (Muhammad faiz rafdli and Suyadi, 2020).

Islamic education must always prioritize and develop various learning methods and models both intellectually and practically. One of the learning methods that can be used is the brain-based learning method (Neuroscience) (Hapsari and Suyadi 2022). This can be done well if supported by other things that can play a role in shaping the mindset and intelligence of students and student concentration to grow better. Things that act like music that can increase the brain power of students, especially auditory students. Lighting that can increase student focus in learning so that it makes it easier for students to think, and a good and comfortable Spatial Layout that increases student learning effectiveness (Tian Khusni Akbar and Suyadi, 2021: 115). Art is one form of media that can develop children's mentality because it can affect emotional, spiritual, cultural, mindset and work patterns (Desfa Yusmaliana and Suyadi, 2019).

When viewed from the explanation above, neuroscience is very useful in Islamic religious education, this is because using neuroscience can optimally absorb and better understand what teachings are contained in Islam so that in the end it will have an influence on individual attitudes in daily life and in carrying out worship. In addition to the important role given by neuroscience in Islamic religious education, no less important is that neuroscience and Islamic religious education are side by side and related to each other. In the Qur'an, the pronunciation 'aql (intelligent) can be interpreted the same as neuroscience which gives implicit meaning that in everyday life always use reason, especially in terms of goodness and truth. In general, 'aql is the main tool for a human being and cultivates information and knowledge that will eventually become the basis for his actions.

In the Qur'an, in addition to the word 'aql there are several words that also have the same meaning as the word 'aql, namely nazara (seeing abstractly in the meaning of thinking), Tadabbara (pondering), Tafakkara (thinking), Faqiha (understanding), and Tazakkara (remembering). All forms of words contained in the Qur'an command man to always use his intellect in doing everything so as to distinguish between good and bad, halal with haram, and haq with bathil. (Ahmat miftahul huda, 2020: 76) The meaning of 'aql in the Qur'an is a symbiose of intuitive potential (emotional intelligence) and discursive potential (intellectual intelligence) in the quest to know, think, ponder, explore, understand, and feel various physical phenomena as well as metaphysical information. (Hodri 2013) By combining these two intelligences, man is expected to arrive at the final essence, the ultimate truth, the origin of all that exists (Asti Faticha Nurjanah, 2018).

Furthermore, Ibn Sina breaks down the theoretical reason or al-'alimat into 4 stages, namely: First, the Material sense or 'al-'uqul hayyulaniah, this material reason has the potential to gain knowledge without experience. Second, the talent mind or 'al-'uqul bi al-makalah, not only for material reason but also functions as a hayyulaniah force that has the potential to digest experience as well as basic knowledge and pure and abstract thoughts has begun to appear. Third, the actual mind or 'al-'uqul bi al-fi'l, the brain that holds the master of restraints based on feeling, hearing, sight, language and other noble roles. Serves as a conceptual. Fourth, the reason of acquisition or 'Al-'Uqul Mustafad, this reason is a form of human reason that can capture the light emitted. (Kharisma Noor Latifatul Mahmudah and Suyadi, 2020).

Broadly speaking, Al-Farabi divides reason into two, namely: first, practical reason that functions to solve technical things and skills and second, theoretical reason that helps the soul get inspiration or inspiration. (Ruri Afria Nursa, 2020) Alfarabi's concept of reason in the theory of Neuroscience is closely related to education. This is because his views that allude to explicit and non-explicit education always relate the sidelines of thinking that replace thoughts and beliefs from the thinking power of reason one to ten. (Ruri Afria Nursa, 2020) In learning, Al-Farabi tends to emphasize the establishment of ethics and thinking. This is based on pure knowledge only formed if the ethics are clean from bad personalities. (Ruri Afria Nursa, 2020).

Based on the explanation above, if drawn into Islamic religious education in schools, the learning model of neuroscience-based Islamic religious education provides challenges and opportunities, especially Islamic religious education teachers in providing learning. With the hope that students become smart with the help of utilizing technology so that they are encouraged to learn it. Neuroscience in Islamic Religious Education as an academic supporter in the concept of reason that rests on the potential of the brain that will affect rational, emotional and spiritual intelligence. Although a teacher or lecturer is not an expert in neuroscience, in the perspective of neuroscience, every day the educator profession is changing the brain in the sense of providing new learning that will be processed by the brain. This is due to higher thinking skills. But so far, educators have changed the brain without science and understanding of brain science (neuroscience). This is because there is no specific science to understand the work of the brain in Education. Therefore, the development of neuroscience in the field of Islamic education is needed. (Mohammad Jailani, 2021: 5)

The Relevance and Urgency of Neuroscience in PAI learning

Based on the explanation above, it can be known that neuroscience is important and has a close relationship with learning. The following can be explained the relevance & urgency of Neuroscience in PAI learning:

Neuroscience and Educators

Neuroscience can help to understand how the brain works so that we can maximize the potential of the brain (Mardiah, Sabda, and Cahyadi 2022). With this understanding, teachers can design teaching methods that are more in line with the way students' brains process information, so that learning becomes more effective. Neuroscience can help in designing a better and relevant curriculum (Jailani et al. 2021). This allows educators to focus on topics and learning methods appropriate to child and adolescent brain development

Neuroscience and Learners

Neuroscience encourages us to understand how the human brain receives, manages, stores and uses that information. This helps education in designing teaching methods that are more effective and appropriate to the way the student's brain learns (Citra Trisna Dewi, et al. 2018).

Neuroscience can help us respond to students' diverse intelligences or multiple intelligences. With this Education can consider the type of intelligence of the child, his talents and desires then educators can use various methods, media and learning objects to develop diverse intelligence (Mardiah, 2022).

Neuroscience can also build a creative mindset in students while building their mentality. The role of the teacher in step by stage inspires students to know more new things through asking, investigating, searching, applying and testing. Neuroscience can make students have creativity and innovation, The more knowledge they have, the more curiosity will increase, the newer ideas that come out, the more diverse patterns and combinations that can be achieved (Rahmi Rivalina, 2020).

Neuroscience and Learning Strategies

By understanding the way, the brain responds to stimuli and learning, teachers can use learning techniques that maximize understanding of the material. For example, they can integrate active methods or the use of images and multimedia to increase student absorption. Such as brain exercises or Lateral thinking, High Order Thinking (HOT), Problem Solving, Multiple Intelligences, Emition Intelligences (Mardiah mardiah, et al, 2022).

Knowledge of neuroscience can help in designing a conducive learning environment. This includes aspects such as lighting, sound or music, and classroom layout, which can affect students' concentration and focus. (Tian Khusni Akbar, 2021).

Through neuroscience, teachers can understand techniques that can improve students' memory. This includes the use of repetition, association and other memory strategies that can help students retain information better.

With knowledge of neuroscience, we can develop more efficient learning technologies and tools, such as brain-based learning applications, that can improve the quality and efficiency of the learning process (Citra Trisna Dewi, 2018).

Neuroscience and Religious Practice

Understanding student motivation and learning behavior from a neuroscience standpoint can help teachers design more effective strategies to motivate students to understand and practice Islamic religious teachings. With an understanding of how the brain processes information, PAI curriculum development can be tailored to be more relevant and appropriate to the cognitive development of students at various age levels

Neuroscience and Learning Difficulties

Neuroscience helps in identifying students who may have learning difficulties (Boleng 2022), Teachers can use a more individualized and adaptive approach based on an understanding of the differences in students' cognitive processes. In addition, Neuroscience can help in identifying learning problems or cognitive impairments in students.

With knowledge of neuroscience, teachers can more easily identify and provide support to students who have learning difficulties. They can look for more appropriate solutions for each student based on an understanding of the differences in their learning process. Thus, neuroscience can help improve the quality of PAI learning by optimizing student learning and presenting more interesting and effective learning.

D. Conclusion

Based on the description described above, it can be concluded that neuroscience has a close relationship with PAI learning, this can happen because the brain has an important role in humans which is used as a control centre for actions to be carried out by humans, including to control emotions and manage thinking power. While the science that discusses related to the brain is neuroscience. So that in the implementation of learning, neuroscience is needed so that learning can run smoothly and effectively.

There are several reasons why neuroscience is considered relevant and important in PAI learning. Among them Neuroscience can help PAI teachers understand better how students' brains process information and learn, With an understanding of brain function, teachers can develop more effective teaching strategies, With knowledge of neuroscience, teachers can more easily identify and provide support to students who have learning difficulties, Neuroscience can also build a creative mindset in students while building their mentality, With an understanding of how the brain processes information, PAI curriculum development can be tailored to be more relevant and appropriate for the cognitive development of students at various age levels.

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