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Hybridization of Islamic Education and Neurosciences: A Study of Suyadi's Thought

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Abstrak

Penelitian ini bertujuan untuk menganalisis tentang bagaimana disiplin ilmu pedidikan Islam dapat dihibridisasikan dengan disiplin ilmu neurosains. Desain penelitian ini menggunakan desain penelitian kualitatif berdasarkan penelitian literatur. Berbagai bahan bacaan, majalah, dan referensi lain digunakan sebagai sumber data dan selanjutnya data tersebut di analisis dengan analisis isi. Hasil penelitian menunjukkan bahwa pemikiran Suyadi mengenai pendidikan Islam dan neurosains dapat dikawinsilangkan (hibridisasi). Hibdridisasi tersebut kemudian menghasilkan varietas cabang ilmu baru yang disebut Neurosains Pendidikan Islam (NPI) diharapkan dapat menjawab tantangan serta kebutuhan untuk mendalami dimensi manusia lebih mendetail lagi sampai pada seluler molekuler hingga regulasi perilaku dan sosiosains. Proses hibridisasi dalam pendidikan membutuhkan kolaborasi antara guru dan neurolog untuk membuat temuan baru guna mengoptimalkan sistem kerja otak dengan menstimulus dan mengeksplorasikan neuroanatomi dan neurofisiologi. Hibridisasi dalam kurikulum merdeka dapat dilakukan dengan mengintegrasikan serta optimalisasi kerja otak melalui pembelajaran berbasis projek. Dimensi otak ada tiga yaitu otak normal, otak sehat, otak cerdas, dan otak karakter. Neurosains pendidikan Islam mengkaji tentang optimalisasi potensi otak untuk pencerdasan peserta didik.

***Kata Kunci**: Hibridisasi, Pendidikan Islam, Neurosains*

Abstract

This study analyzes how Islamic education disciplines can be hybridized with neuroscience disciplines. This study employs a qualitative research methodology based on literature review. Data were gathered from a variety of books, periodicals, and other sources, and were then subjected to concept analysis. The results show that Suyadi thoughts on Islamic education and neuroscience can be hybridized. The hybridization then resulted in various new branches of science called *Neurosains Pendidikan Islam* (NPI). It is can answer the challenges and

needs of exploring the human dimension in more detail, from molecular cellular to behavioral regulation and social science. In its implementation, educators and neurologists must make new findings to optimize the brain's working system by stimulating and exploring neuroanatomy and neurophysiology. Hybridization in the independent curriculum can be done by integrating and optimizing the brain's work Hybridization in the independent curriculum can be done by integrating and optimizing the brain's work. There are three dimensions of the brain, namely normal brain, healthy brain, intelligent brain, and character brain. Islamic education neuroscience examines the optimization of the brain's potential for students' intelligence.

***Keywords**: Hybridization, Islamic Education, Neuroscience*

Introduction

In recent years, the development of science has been incredibly rapid and vast. Many study subjects have begun to cross over into other studies or transdisciplinary sciences, expanding the breadth of education beyond its traditional boundaries. Education is beginning to investigate other fields with a different perspective than education, but these differences can broaden the intellectual property repertoire to allow for dynamic growth. Education is described as fostering an individual's ability or potential to acquire knowledge, emphasizing the transfer of knowledge and skills. According to Sweller (2020), basic education focuses on developing a person's talents, while secondary education develops their knowledge and ability to recall information in order to react to their surroundings. This calls for the cooperation of two complementary scientific disciplines, or even the complementarity of the two complementary disciplines, in order to produce a new variety of knowledge.

The contrast between religion and science renders both sciences dry and monotonous. A great deal of science also appears rigid and eerie due to its inflexible presentation (Pramono & Ansori, 2016). The division between science and religion frequently causes the two sciences to be combined ineffectively (Ja'far as-Shodiq, 2020). Islamization of science is a strategy used to combat this dichotomy problem that involves integrating religion and general sciences (Nuryani, 2022). As a type of creativity, science must be able to open up land for the overall development of this knowledge in anticipation of new phenomena (Vázquez-Guardado et al., 2020). In science education, some values lead to goodness for the universe, and people who use that knowledge, which is based on universal Islamic values, to provide advantages for all living things on the planet.

As a result of advancements in science and technology, intellectuals continue to mature; hence, scientific innovation or novelty is required. Peters indicates in Pramono (2016) evokes the phenomena of literary hybridization in conjunction with the globalization

of human modernity. The maximalist approach is also viewed as the initial foundation for creating novel ideas in idealist circles. (Pramono & Ansori, 2016). Scientists and authors no longer consider the current state of knowledge but rather how research evolves and can be merged with other science disciplines. The merger of religion and science is still taboo, as integrating specialized with others is viewed as exploitative and difficult to comprehend. Collaboration between the sciences is evident in the use of two or even more than two theories and methodologies, which is viewed adversely in the form of work, whether scientific or otherwise (Junaedi, 2018; Sweller, 2020). The existence of hybridized scientific disciplines or the integration of knowledge currently refutes this opinion. Educational psychology, neuroeducation, and neurospiritual studies, among others, are among the numerous recent discoveries in interdisciplinary science and established interdisciplinary science.

Hybridization is the blending or union of two different scientific disciplines. The effects of hybridization are more commonly employed in natural science areas like agriculture, animal husbandry, algorithms, and other natural sciences, while they have not yet been clearly shown in the realm of education (Suyadi, 2020). For example, in Wayan's article titled “Study of Quantitative Properties of F2 Strains of Maize Crops in Dry Land," According to the findings of the study, the leaf tips and F1 yield of all existing hybridizations were identical to those of each parent. However, three hybridizations exhibited larger negative leaf tip heterosis values (Sudika et al., 2021). Another study by Irawan examined the possibility of hybridization between African catfish Clarias gariepinus and Sembilang plotosus canius (Irawan, 2019). According to these investigations, hybridization in the scientific sector has been demonstrated to yield only new types.

Education is the purposeful development of one's potential to acquire knowledge. The broad meaning of developing this potential is transferring knowledge and skills. Education is the purposeful development of one's potential to acquire knowledge. The broad meaning of developing this potential is transferring knowledge and skills. Learning is a process to reach goals; hence, learning is not a goal but a process. Accordingly, learning is a process that can be pursued via the education process. According to Sagala, cited by Yuliana, education is a concerted effort made by families, communities, and the government through teaching, advising, and training activities conducted in and out of school (Yuliana Alfiyatin, Heriyanto, 2020). Education plays a crucial role in establishing the order of human existence, as it affects how advanced or not the order of human life is (Hamzah, 2019). In the

educational process, numerous aspects of educational teaching must be modified. Therefore, the necessity for scientific advancements from the perspective of education, which will eventually be advantageous to society.

Islamic education emphasizes the building of communities through institutional networks. In its implementation, Islamic education, for instance, employs a modern style consistent with the growth of contemporary and future societies (Rusdianto, 2015). Islamic education has always been a way to accomplish the proper objectives based on the Qur'an and Sunnah in an effort to combat aberrant behaviors in people's lives by relying on no one school of thought in particular (Arif Setiawan, 2019). In the perspective of educating society, education actually has a crucial place. In order to protect and encourage Islamic and human values at all societal levels, the concept of Islamic education must prioritize intellectual growth, educational attainment, and social class.

Consequently, the modern advancement of science and technology provides numerous new advances in Islamic education. The latest breakthrough in Islamic education and neuroscience is related to Islamic education and neuroscience. Neuroscience is the investigation of the brain (Hidayat & Syahidin, 2019). Neuroscience studies brain perception, awareness, and sensitivity, as well as memory and learning-related processes. According to the neuroscience hypothesis, the nervous system and the brain constitute the physical substrate for the human learning process. Neuroscience is the scientific study of how the nervous system, especially the brain, functions (Wathon, 2016). It posits a theoretical contradiction between Islamic education and neuroscience, which departs from several existing views. According to Sylwester, whom Suyadi cited, educators have not used brain science or neuroscience knowledge to develop the brain's potential for centuries. (Suyadi, 2020). Until now, Islamic education has only discussed the mind (neurophysiology); it has not led to a discussion of the brain (neuroanatomy).

On the basis of what we know about human cognition, Sweller claims that the cognitive load theory offers recommendations for instruction (Sweller, 2020). Evolutionary psychology makes the assumption that knowledge must be separated between primary biological information, which we have expressly evolved to learn, and secondary biological information, which we have not specifically evolved to acquire. This theory makes advantage of this cognitive architecture to create learning processes that are largely applicable to complicated material that has a low working memory load need. The usage of educational technology may make a number of these teaching techniques the most simple.

According to Sweller (2020), the cognitive load theory makes suggestions for training based on our understanding of human cognition. According to evolutionary psychology, knowledge must be split into primary biological information which we have specially developed to get and secondary biological information which we have not specifically developed to obtain (M Abdul Fattah Santoso, 2018). This theory makes advantage of this cognitive architecture to create learning processes that are mostly applicable to complicated material that has a low working memory load need. With the use of educational technology, several of these instructional techniques may be applied most readily. The Law of Attraction is a highly potent force that exists in the reality of the mind as the center of human beings (Ibad, 2023). According to scientific research on the Law of Attraction Asti et all (2018), people are the architects of their own futures. Humans can control their thinking and emotion patterns through it, which will decide how they will behave in the future. According to the Qur'an, the heart is the place where the Law of Attraction's power originates, yet according to neuroscience, the brain is where it does.

Based on the preceding description, it is essential to investigate Suyadi's opinions or perspectives regarding Islamic education, which can be crossed or hybridized with other fields. The amalgamation of Islamic education and studying the brain and nervous system (neuroscience). Therefore, there is a need for thorough research to integrate other similar sciences. To answer the challenges of Islamic education by linking other disciplines.

Research Methods

This study employs a descriptive-qualitative methodology and a sort of library research or literature study to investigate the fusion of Islamic education and neuroscience. This kind of study aims to methodically and rationally explain a notion so that others may comprehend it and yet share that conception's viewpoint (Santosa, 2015). The literature on Islamic education and neuroscience is gathered from books, journals, and other publications. In order to obtain data for this study, books and publications devoted to research were employed as documentation. In order to reduce mistakes and prevent spreading false information, content analysis uses reading books frequently and cross-referencing various libraries while evaluating data (Lubis, 2018). The findings of this study are then presented using straightforward ideas that will help people comprehend Islamic education and neuroscience.

Research Finding

1. Tracing the Traces of Reason and Brain in Islamic Education and Neuroscience

Amid numerous crises, Islamic education is intended to serve as a model for alternative education that aims to describe life's difficulties and lead to a progressive and civilized society. This aspiration becomes a requirement, given that Islamic education has historically strived to demonstrate beneficial effects at the height of Islam. It is anticipated that Islamic education will integrate the Muslim population into the religion (Sudrajat & dkk, 2016). The Muslim community thinks that because the notion of Islamic education is founded on the Qur'an and hadith, it is superior to other educational concepts based on human cognition, whose truth is relative.

Before this point, the three key areas that target learners and are required are ideal goals rather than realizable realities. On the other hand, there are educational institutions that emphasize cognitive aspects. There are several reasons for this predicament, but the most significant is the teacher's ignorance and lack of knowledge of how the three domains are interconnected. The human brain is fundamental to this relationship. Due to a need for more knowledge regarding the mechanics of brain activity, these three domains are distinct components that must be examined independently. (Kasno, 2019). Counting courses, for instance, are commonly viewed as subjects that can only expand the cognitive areas of students.

On the other hand, character, moral, and religious education resources are lessons that can only benefit their motor and emotional development. If the approach is reversed, the human thought process may be comprehended. Numeracy lessons, previously used to build students' cognitive intelligence, can also improve and develop their emotional intelligence. Numeracy lessons can help students develop their emotional intelligence (EQ) and spiritual intelligence (SQ) to use words often employed in educational institutions today.

The human brain is the source of all of our skills. Neuroscience studies the brain and nervous system (Pasiak, 2016). Neuroscience has deep historical origins, particularly in Islamic educational philosophy. The evolution of neuroscience can be connected to the classical and contemporary resources of Islamic educational thinking (Suyadi & Widodo, 2019). The study of Islamic educational philosophy, Sufism, and ushul fiqh will reveal these vestiges. These new results to trace the path of neuroscience depend on the concept of thought, which serves as a keyword in these studies. In the study of Islamic philosophy,

Sufism, and ushul fiqh, there are no restrictions on the inclusion of the concept of reason in other scientific domains, even if they utilize distinct terminology. Discourse on philosophical disciplines associated with the notion of reason, specifically insan Kamil, such as (mind, soul, heart, and spirit). As for the rational discourse of ushul fiqh studies, specifically maqosid shari'ah, and hifdzul aql. If the traces of neuroscience in Islamic thinking are read from the perspective of Sas-Hank Varma's training in neuroscience, then the position is in the metaphysical realm of God. The traces of neuroscience in Islamic educational thinking include traces of neuroscience in Islamic philosophy (emansi), traces of neuroscience in the study of taswauf (insan Kamil), and traces of neuroscience in ushul fiqh (Jailani et al., 2021).

According to Al Ghazali, (insan kamil) beings are based on the verses of the Qur'an in QS. Ash Shams verses 7 and 8, QS. Al Isra verse 85, and QS. Al Mulk verse 10, which read:

وَنَفۡسٖ وَمَا سَوَّىٰهَا ٧ فَأَلۡهَمَهَا فُجُورَهَا وَتَقۡوَىٰهَا ٨

"And [by] the soul and He who proportioned it 8. And inspired it [with discernment of] its wickedness and its righteousness," (QS. Ash Syams [91]:7-8).

وَيَسۡـَٔلُونَكَ عَنِ ٱلرُّوحِۖ قُلِ ٱلرُّوحُ مِنۡ أَمۡرِ رَبِّي وَمَآ أُوتِيتُم مِّنَ ٱلۡعِلۡمِ إِلَّا قَلِيلٗا ٨٥

"*And they ask you, [O Muhammad], about the soul. Say, "The soul is of the affair of my Lord. And mankind have not been given of knowledge except a little."* (QS. Al Isra' [17]:85).

وَقَالُواْ لَوۡ كُنَّا نَسۡمَعُ أَوۡ نَعۡقِلُ مَا كُنَّا فِيٓ أَصۡحَٰبِ ٱلسَّعِيرِ ١٠

"And they will say, "If only we had been listening or reasoning, we would not be among the companions of the Blaze." (QS. Al Mulk [67]:10)

From the verses above related to fitrah, spirit, qolb, nafs, and aql are metaphysical terms in Islam that have dual biological and metaphysical meanings (Al-Ghazali, 2003). Biologically, the concept of the nafs is analogous to the factors that motivate human anger and negative characteristics. Similarly, all other metaphysical concepts are understood to have two dimensions. Al-Ghazali presents different strategies for maintaining fitrah, keeping the spirit and qolb in control of the nafs, and employing 'aql in the context of education (Al-Ghazali, 2003). Ibn Sina, another Muslim scientist, had a multidimensional conception of reason. Ibn Sina's concept of stratified reason consists of four elements: prospective, active, real, and empirical, as cited by Suyadi (Suyadi, 2020). According to Ibn Sina, Taufik Pasiak constructs the layered level of reason as an active, real, potential, and empirical brain.

(Pasiak, 2012). Al-Farabi had similar ideas to those of al-Ghazali and Ibn Sina regarding the metaphysical concepts of fitrah, spirit, qolb, nafs, and aql. Al-Farabi divides reason into three categories: God as reason, reason in the philosophy of emanation one through ten, and human reason (Afria Nursa & Suyadi, 2020).

The Qur'an says that the term "aql" is referenced forty-nine times in the form of anything previously used, composed of the words ta'qilun twenty-four times, ya'qiluha once, and na'qilu once. Times, the term ya'qilun twenty-two times, the word aqalah once, and as a verb forty-eight times. (Nurjannah, 2022). According to the Qur'an and hadith, all manifestations of words in the Qur'an exhort humanity always to apply reason when thinking. The purpose of the mind or reason is to evaluate the actual world, to know, to think, and to be able to differentiate between evil and good, wrong and right, haram and haram so that humanity might live according to their religion. (Arif Setiawan, 2019).

The basis of neurobiology in the study of Islamic education can be found in QS. Al-Alaq verses 15 and 16, which read:

كَلَّا لَئِن لَّمۡ يَنتَهِ لَنَسۡفَعَۢا بِٱلنَّاصِيَةِ ١٥ نَاصِيَةٖ كَٰذِبَةٍ خَاطِئَةٖ ١٦

"No! If he does not desist, We will surely drag him by the forelock - 16. A lying, sinning forelock". (QS. Al Alaq [96]:15-16).

Based on the verse above, the term "nasiyah" is the crown and refers to the brain. In Nasiyah (fontanel), it is based on character because it is the owner of the fontanel who is the cause of an action. Nasiyah itself does not only mean the crown but also covers the entire human body. Then the relationship between character formation and the human brain is one that lies in the frontal and parietal lobes (Arista et al., 2022; Rofdli & Suyadi, 2020). Based on the results of the views of mufassir and scientific scientists on the meaning of nashiyah in the Qur'an, it is believed that when the fontanel is damaged, this will have an impact on changes in human behavior and mindset. When humans are physically tortured in the afterlife, the crown is the first and most important organ to feel the pain. Because this crown will give good and bad colors to human actions.

While the qalb is viewed from a neuroscientific point of view, the mind and the qalb functionally have something in common (Nasruddin & Muiz, 2020; Nurjannah, 2022). Qalb, as derived from Hadith, is the king of the human body. The Messenger of Allah said: "Know that every king has a fence (rule)." Know that Allah's fences are His prohibitions. Understand that there is a lump of flesh in the human body. If he is good, then his whole body will be

good, and if he is bad, then his whole body will be bad too. "Know that this lump of flesh is the heart." (Hadith History of Bukhari and Muslims).

The word "mudhgah" in the hadith has a vital role in maintaining the good and bad of the body and is also the key to the life lived by humans. just like the human brain, which is the key to life and coordinates and controls all things in various bodies. The brain is the center of good and bad physical conditions. Then the terms "change your brain, change your body" and "change your brain, change your life" were coined (Ahmat Miftakul Huda & Suyadi, 2020; Noor, 2019). Based on this explanation, it can be concluded that functionally, the qalb is very closely related to the function of the mind. Therefore, it is difficult to separate the work of the heart from the work of the mind because these functions are integrated with each other. And if it is directed towards the concept of religion, then the role of the qalb is in the spiritual mind or in the spirituality of the mind, which has responsibility for the diversity and spirituality of every human being.

In addition to the imparting of values and knowledge, the purpose of Islamic education is to maximize human potential. The majority of human talents are dependent on their brains. Neuroscience is the study of the human brain. Therefore, Islamic education and neuroscience can be hybridized or interbred (Suyadi, 2019). The hybridization of Islamic education with neuroscience can generate numerous fields known as Islamic education, neuroscience, or Islamic pedagogical neuroscience. These new forms of knowledge have the potential to develop into additional scientific disciplines, such as Islamic educational psychology, sociology of Islamic education anthropology, Islamic economics, Islamic politics, and Islamic educational philosophy. (Suyadi, 2020). Tarun Ikrar had the same sentiment when asked, "What disciplines are similar to the neuroscience disciplines?" He answered, "various" (Ikrar, 2016b). This indicates that accurate investigations and social studies, in addition to mental health, are conducted in neuroscience. Neuroscience in Islamic education can also be used as a development for scientific integration research, such as Abdullah's hypothesis, but is restricted to only two scientific fields: Islamic education and neuroscience.

2. Relationship Between Islamic Education and Neuroscience

According to Suyadi, the difference between Islamic education and neuroscience can be bridged by an education-and-science bridge. (Suyadi, 2020). Kurt W. Fisher remarked that the link between neuroscience and education should take place in the classroom, not the neuroscience laboratory. (Fischer, 2009). Jodi Tommerdahl, however, productively countered Fischer's theories. He stated that it was impossible to immediately apply

neuroscience laboratory findings to classroom instruction (Tommerdahl, 2010). From a neuroscience laboratory to teaching and learning techniques in the classroom, Jodi creates a powerful intermediary or path in the shape of a thinking bridge to connect the mind, the brain, and education. Jodi outlines five stages or approaches for incorporating neuroscience laboratory research findings into teaching and learning activities. The five steps include neuroscience and the brain (neuroscience), cognitive neuroscience, psychological mechanisms, educational philosophy, and classroom instruction. (Tommerdahl, 2010). As should be mentioned, Fischer and Jodi Tommerdahl are neurologists, not educators. Therefore, they cannot incorporate neuroscience in the classroom because they are not educators.

Teachers who have yet to communicate with the neuroscience laboratory are in a different scenario. In other words, if the educator agrees with the neurologist's judgment alone, the practice of education in the classroom will remain relatively the same as it has been in the past. Individuals may continue to need clarification or errors in application and simplification. Although they assert that classroom teaching serves as the foundation for educational and neurological research, they are not active classroom teachers. Neurologists are always searching for ways to implement laboratory discoveries into classroom instruction. Thus, educational practice has always been an "object" of scientific study. They enthusiastically attempt to implement the experimental outcomes of neuroscience in the classroom. As a result, all of these efforts always result in understanding, proper application, and oversimplification (Alferink & Farmer-Dougan, 2010).

Suyadi believes that the linking bridge provided by Jodi Tommerdahl is merely a technique or instrument for implementing new results in the field of neuroscience into the classroom without causing disruption. Hybridization necessitates neurologists and educators working together to determine how kids' brains can optimally grow through their educational experiences.

3. Hybridization Model of Islamic Education and Neuroscience

The fusion of neuroscience and Islamic education aims to create an "integrated classroom," or a classroom containing both neuroscience laboratory equipment and Islamic educational materials. The importance of a classroom or neurology laboratory to neurologists is negligible, although instructors and neurologists conduct research together. Neuroscience education that is inexpensive, simple, and applicable utilizes Neurogaming EEG to discover essential topics in neuroscience or Neuroscience (Suyadi, 2020). Integrated

classroom laboratories or integrated learning laboratories can be observed in the hybridization of Islamic education and neuroscience in the research of Norcia Fuzan, who measured brain waves using an electroencephalogram (qEEG) in individuals reading the Quran as a treatment. (Fauzan & Shahidan, 2015).

The hybridization of Islamic education with neuroscience can also boost the consortium- and the neurology-based idea of neuroeducation developed by Johns Hopkins University (Mercier et al., 2012). Islamic Education (PI) and Neuroscience (N) were joined or crossed to produce Islamic education neuroscience, a new field of study based on the hybridization of Islamic education and neuroscience (NPI). Suppose the hybridization model of Islamic education and neuroscience is described with integrated chapters in the form of a science that covers brain enhancement in learning. In that case, the model will be considered a science. This phrase is consistent with the objective of national education in Indonesia, which is to impart the nation's history and culture.

Given that the brain is the seat of intelligence and education is how the brain can be enhanced, enhancing the brain's potential is a combination of the two. This word aligns with Taruna Pledge's diverse perspective that neuroscience is an interdisciplinary field that examines the brain. (Ikrar, 2016a). Suyadi believes that a teacher or educator must be able to place the right foot in the classroom and the left foot in the neuroscience laboratory, given the mix of Islamic education and neuroscience. (Suyadi, 2020). On the other hand, the left foot must remain in the classroom, and the right foot must remain in the neurology laboratory. Thus, the competency of educators and neurologists is a product of Islamic education and neuroscience.

Islamic education and neuroscience, according to Suyadi, can at least cover the fundamentals of neurophysiology and neuroanatomy. (Suyadi, 2020). With these two fundamentals, learning theory is simple to comprehend and knows how to excite students' brains properly. Neuroanatomy is separated into two portions: the right and left hemispheres. However, the function (neurophysiology) is more extensive than the cerebral hemispheres. Only by crossing over are the connections between the two regions of the brain that control movement and body feelings equally dispersed. The implications of implementing education are derived from pupils' cognitive function and living skills. Islamic education must teach pupils the skills necessary for success in life; students' success is not limited to academic success. However, abilities are required to adapt to the world's quick evolution. These talents include general skills and specific skills (*Special Skill*s). Understanding students' three pillars

of success, namely cognitive, emotional, and psychomotor, is crucial for attaining these skills. These three characteristics, referred to as "Ulul Albab" in the Qur'an, constitute a better personality. It is a reality that the human brain plays a crucial role in this, which surprises the education community.

The hybridization of Islamic education and neuroscience represents the continuance and specialization of experimental sciences, Islamic grants, integration, and interdependence. If Al-Faruqi Islamized science, Kuntowijoyo studied Islam, and Amin Abdullah combined the two, then Al-Faruqi Islamized science, Kuntowijoyo studied Islam and Amin. Suyadi then crosses or hybridizes Islamic Education and Neuroscience in his research, forming new scientific disciplines or variants of new scientific branches (Suyadi, 2020). Neuroscience in Islamic education is described as the study of maximizing the brain's potential in Islamic religious education. Teachers and neurologists are necessary to collaborate in the design of Islamic religious learning strategies in order for them to serve as a tool for maximizing the cognitive potential of children. This collaboration is analogous to the teacher's right foot requirement to stand in the Islamic religion. His left leg is positioned in the neuroscience laboratory and the study room. On the one hand, religious learning practices must be incorporated into schooling. On the other side, he must design an Islamic religious education curriculum based on how the brain acquires knowledge of neuroscience. Combining the two will produce hybrid skills for delivering interventions and enhancing students' cognitive capacity.

The hybridization of Islamic education and neuroscience that has been described above is in line with the results of the interviews that have been conducted by researchers. One of them is that the independent curriculum contains learning that is fun and relevant to students. In addition, the most important aspect is ethics, which includes a person's morals. Because in the independent curriculum the teacher does not only transfer knowledge but the teacher must also be able to become a facilitator for his students to explore the potential that exists by inserting moral elements in students. One way to explore this potential can be done by means of teachers and students actively communicating and discussing together to determine what material they will learn.

4. Scope and Expansion of Islamic Education Neuroscience Study Area

According to Moh Hasan Machfoed quoted by Ikrar (Ikrar, 2016b), Neuroscience is a discipline that aims to solve the brain's puzzle or mystery. The brain is one of the most significant human organs since it is the "primary and initial" factor in determining the quality

of life and human life; therefore, other scientific disciplines must be utilized to convey this. The brain acts as a unit, necessitating a complete scientific approach to studying everything related to the brain, such as health, economy, society, culture, politics, psychology, and technology.

According to Ikrar (Ikrar, 2016b), neuroscience studies the neural systems of organisms. They focus on the intricacy of the human brain, the duality between every human's body and soul, and consciousness as the primary factor in defining human identity. Dendrites, axons, and a nucleus form the primary structure of a nerve cell, which is the basis of the human nervous system. The nervous system is shielded by a layer of nerve cells known as neuroglia. Neurons are the primary components of a neurological system. There are around 100 billion neurons in each nerve cell, with more than a trillion billion connections that function systematically. The nervous system comprises the organs responsible for the senses of smell, sight, hearing, and movement. There are numerous types of neuron patterns from an anatomical standpoint.

Etymologically, neuroscience is a neural science that investigates neurology, particularly the multidisciplinary study of neurons or nerve cells. (Pasiak, 2016). Neuroscience is the branch of science that focuses primarily on studying the nervous system. On the basis of this description, neuroscience can alternatively be described as the study of the human brain and all spinal cord functions. (Wathon, 2016). The objective of neuroscience is to explore the biological foundation of every behavior, according to Suyadi's citation of Pasiak (Suyadi, 2020). It is asserted that the primary objective of neuroscience is to provide explanations from multiple perspectives for human brain-based behavioral processes. Recent neuroscience research has shown evidence of an inextricable link between individual human behavior and the brain. According to the Positron Emission Tomography (PET) device, six brain systems are responsible for regulating all human behavioral processes. The six brain systems are the basal ganglia, limbic system, cingulate gyros, temporal lobes, prefrontal cortex, and cerebellum. Each of the six brain systems plays a critical role in regulating affective, cognitive, and psychomotor functions, including IQ (Intelligence Quotient), EQ (Emotional Quotient), and SQ (Spiritual Quotient) (Suyadi, 2012).

The role of IQ (Intelligence Quotient), EQ (Emotional Quotient), and SQ (Spiritual Quotient) in education is very important. This was also expressed by one of the teachers who stated that the spiritual quotient is a complement to the achievement of the intelligence

quotient and emotional quotient, so that from the three a balanced personality is formed. Within the scope of Islamic education, students are given a space for religious learning in understanding the existence of Allah SWT and the existence of humans who are His creatures who have the duty to worship. Teachers and parents are required to instill religious values. It is these religious values that then expand the potential of spiritual intelligence possessed by students. If the spiritual intelligence of students is good, it will strengthen the potential for intellectual and emotional intelligence, so that intelligent and dignified students will grow. This is in line with what was expressed by Suyadi in the description above.

Neuroscience is concerned with individuals. Because neuroscience seeks to investigate the smallest aspects of humans in greater detail, from molecular and cellular processes to behavioral and socioscientific activities, it is interdisciplinary. Studies of the molecular and cellular level teach about the various types of neurons and how they operate differently to produce extremely complex behaviors such as emotions, actions, and cognition. Nervous system studies examine neurons with the same function in a whole system such as vision problems studied using the visual system. Neuroscience investigates how the behavior of the nervous system interacts to produce certain behaviors, such as how the auditory, visual, and motor nerves process information stimuli to produce specific behavioral actions. Social or neurosocial neuroscience investigates the role of the human social brain in facilitating interpersonal relationships.

5. Neuroscience, Character Education and Self-Control System

The study of the human nervous system and brain is undergoing rapid development. In education, where the unique development of brain capacity is intimately tied to the attainment of teaching and learning outcomes in academic units, experts are continually studying their interaction with human existence. However, people occasionally consider techniques in which the brain serves merely as a repository. The brain can learn how to integrate emotions, memories, and intents, subsequently shaping a person's mental existence. (Susanti, 2021). In carrying out the learning process, the brain inserts this information into a container that previously contained relevant information so that it can be reorganized, reassembled, and reevaluated.

According to Suyadi, the development of the human brain is most rapid at the age of zero to six years (Susanti, 2021). Brain optimization begins with early childhood education since, at that age, it is the most effective means of preparing the next generation to have normal, healthy, and bright brains. A normal brain is one that, according to its anatomical

structure, has a highly developed biological structure. (Suyadi, 2020). A healthy Brain is an intellectual ability. However, thinking skills encompass the development of rationality and emotional and spiritual intelligence (Suyadi, 2020). A smart Brain is a brain associated with the overall outcomes of thought and problem-solving strategies. This three-dimensional brain is depicted in the image below.:

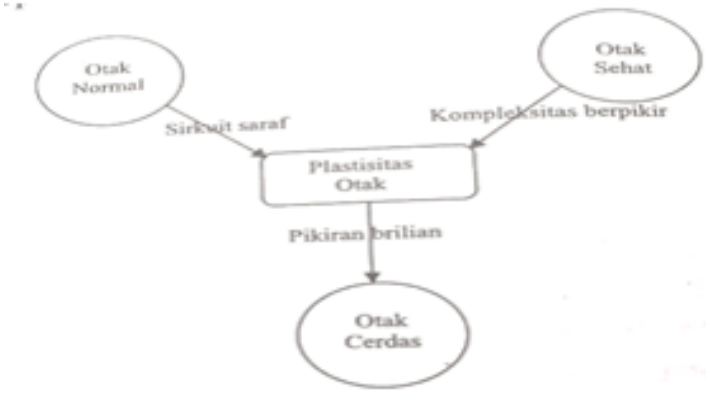

Figure 1. Three Dimensional Brain: Normal Brain, Healthy Brain, and Smart Brain

According to Suyadi, the intelligent brain is not merely a subset of the brain but a complex amalgamation of several bits of intelligence (Suyadi, 2020). These formulas then mold students' personalities. It is the consequence of linking a network of neural circuits in order to develop problem-solving thought. Suppose a normal brain is related to developing a complete neurobiological structure. In that case, a healthy brain is associated with cognitive abilities, and an intelligent brain is associated with problem-solving or bright ideas. The character brain is associated with these three brains.

In the context of Islamic education in elementary schools, the whole series of learning is carried out in an integrative thematic manner which is reflected in the current independent curriculum. This is in accordance with the interviews that the researchers conducted in one of the first-grade elementary schools. In the Islamic education subject matter for first grade elementary school semester one there is material about getting to know the Qur'an. In this matter, the teacher gives an example of a picture in the room where someone is reading the Qur'an, but students imitate the picture more thoroughly, namely by adding ornaments such as a picture of a wall clock, ornate calligraphy, and coloring it with different colors. colorful according to the wishes of students. This shows that the stimulus given by the teacher in the subject matter with the theme of knowing the Qur'an by students is responded to by the experiences they go through every day. This whole thinking forms intelligent minds with the products they develop through healthy brains.

According to pasiak in Suyadi, the brain contains six networks of the nervous system that cooperate to control human behavior (Suyadi, 2020). The six brain systems are the prefrontal cortex, limbic system, cingulate gyros, basal ganglia, temporal lobes, and cerebellum. The brain's nervous system governs human conduct. Therefore, the behavior that humans exhibit results from the brain's ability to give incentives in response to inputs. All things that have the potential to enhance cognitive function should be regarded as the most crucial. It is possible to increase the quality of the human brain via an educational process that leads to human behavior through personal education. In reality, the purpose of personal education is to educate the process of good behavior (ethics, karma); in Islam, it is popularly known as al akhlaqul karimah. Islam teaches good behavior to all humanity by referring to and based on the Qur'an and Sunnah. The essence of Islamic education is character education that is able to teach moral behavior.

Self-control between the Qur'an and neuroscience in learning finds several activities, namely emotional riyadhah, prayer and religious learning, patience, and empathic learning (Suyadi, 2020). In Ridah, emotions in the Qur'an are found in Surah Ali Imran verses 133–134. The command to pray before and after religious learning is found in the Quran, Surah Thaha, verse 114. Patience is based on Surah al-Anfal, verse 66. Emphatic learning can be found in Surah Al Baqarah verse 216.

Self-control in the Qur'an focuses on the soul through various expressions, including nafs al lawwamah, anger, and muthmainnah. In neuroscience, the limbic system, which regulates anger, grief, fear, pleasure, love, discomfort, and surprise, is central to self-control. In the Qur'an, self-control can be achieved through lying down, conducting ablution, sitting, praying, being patient, training oneself, purifying one's soul, and fasting. Meditation, yoga, and relaxation can help with self-control in the field of neuroscience.

Suyadi's thinking can in fact be crossed or hybridized between Islamic education and neuroscience, as evidenced by some of the descriptions of Islamic education and neuroscience provided above, which include tracing the traces of reason and brain in Islamic education and neuroscience to the self-control system. Islamic education, on the other hand, emphasizes fostering institutional networks for communal development. For instance, Islamic education adopts a contemporary approach that is compatible with both the present and the future growth of society. In contrast, neuroscience is concerned with the neurology of the human brain. As stated by Sweller (2020), education comes in the form of primary education, which focuses on developing one's talents, while secondary education develops

knowledge and the ability to remember information to react to their environment. This is related to the ability of the brain to respond to a stimulus according to its capacity.

Judging from Islamic and Neuroscience education, that is very far-reaching. However, Suyadi's thoughts do not use a bridge of thought to connect the mind, brain, and education, from a neuroscience laboratory to practicing teaching and learning in the classroom. However, Suyadi proposes a connection between Islamic Education and Neuroscience by identifying ways to maximize pupils' brain development potential through their learning. This can be accomplished through the collaboration of educators and neurologists. Similarly, a teacher or educator must be able to place the right foot in the classroom and the left foot in the neuroscience laboratory. On the other hand, the left foot must remain in the classroom, and the right must remain in the neurology laboratory. Thus, the competency of educators and neurologists is a product of Islamic education and neuroscience.

Suyadi's ideas regarding Islamic education and neuroscience led to the formation of a new branch of science known as Islamic Education Neuroscience. (NPI). In addition to other scientific disciplines, including the psychology of Islamic education, the philosophy of Islamic education, the sociology of Islamic education, Islamic politics, and Islamic economics. This BOP can address the issues and needs that can investigate the smallest human behavioral elements. Connecting cerebral circuits to generate problem-solving thought allows for the study of human behavior in the brain's dimension. This human behavior demonstrates a correlation between the dimensions of a normal brain, a healthy brain, an intellectual brain, and a brain with character.

Islamic education and neuroscience apart from producing a variety of new branches of knowledge turn out to be able to answer challenges in the world of education today. One of them in the independent curriculum indirectly links neuroscience. Learning is fun and emphasizes moral attitudes and combines intellectual, emotional, and spiritual intelligence so that it can produce excellent and dignified students. In addition, in the independent curriculum, the subject matter is integrated with one another using projects to strengthen the Pancasila student profile. This is a form of combining cognitive, affective, and psychomotor aspects simultaneously. So that the potential of students can increase and have character.

Conclusion

Islamic education and neuroscience fusion represent a continuation and specialization of experimental science, Islamic grants, integration, and linkage. Then, a new model or variant of Islamic education, called the NPI, emerged (Islamic Education Neuroscience). Education in Islamic Neuroscience is equipped to meet the current challenges and requirements. One of them is in the independent curriculum which links the science of neuroeducation. Neuroscience As with other scientific disciplines, the future of Islamic education is fraught with difficulty. These sciences include Islamic educational psychology, Islamic educational philosophy, and Islamic educational neuroscience. Neuroscience and Islamic education can at least include the fundamentals of neurophysiology and neuroanatomy. These two fundamentals facilitate the comprehension of learning theory and know how to properly excite the brains of students. Neuroscience in Islamic education is the study of maximizing the brain's capacity for Islamic religious education. Teachers and neurologists are necessary to collaborate in the design of Islamic religious learning strategies in order for them to serve as a tool for maximizing the cognitive potential of children. The study of the human nervous system and brain is undergoing a period of rapid development. Experts continually study their interaction with human existence in the realm of education, where the unique development of brain capacity is intimately tied to the attainment of teaching and learning outcomes in academic units. Neuroscience is concerned with humanity. Because neuroscience strives to investigate the smallest dimensions of humans in greater detail, from cellular to molecular to behavioral and socioscientific activities, it is a multidisciplinary field. The normal brain is associated with developing a complete neurobiological structure, the healthy brain is associated with thinking skills, and the intelligent brain is associated with problem-solving or brilliant ideas. The character brain is the result of the combination or interrelationship of the three brains, namely the brain. The brain is both healthy and intelligent.

The brain's nervous system governs human conduct. Therefore, humans exhibit behavior from the brain's ability to give incentives in response to inputs. Self-control in the Qur'an focuses on the soul through a variety of expressions, including nafs al lawwamah, anger, and muthmainnah. In neuroscience, the limbic system, which regulates anger, grief, fear, pleasure, love, discomfort, and surprise, is central to self-control. In the Qur'an, self-control can be achieved through lying down, conducting ablution, sitting, praying, being patient, training oneself, purifying one's soul, and fasting. Meditation, yoga, and relaxation

can be used to control self-control in neuroscience. Therefore, this knowledge is necessary to study in various sectors, including education, medicine, and other disciplines, particularly Islamic education.

Bibliography

Afria Nursa, R., & Suyadi, S. (2020). Konsep Akal Bertingkat Al-Farabi Dalam Teori Neurosains Dan Relevansinya Dengan Pendidikan Islam. *Tawazun: Jurnal Pendidikan Islam*, *13*(1), 1–17. https://doi.org/10.32832/tawazun.v13i1.2757

Ahmat Miftakul Huda, & Suyadi. (2020). Otak dan Akal dalam Kajian Al-Quran dan Neurosains. *Jurnal Pendidikan Islam Indonesia*, *5*(1), 67–79. https://doi.org/10.35316/jpii.v5i1.242

Al-Ghazali, I. (2003). *Menuju Labuhan Akhirat*. Pustaka Progresif.

Alferink, L. A., & Farmer-Dougan, V. (2010). Brain-(not) Based Education: Dangers of Misunderstanding and Misapplication of Neuroscience Research. *Exceptionality*, *18*(1), 42–52. https://doi.org/10.1080/09362830903462573

Arif Setiawan, M. Z. A. (2019). Urgensi Akal Menurut Al Qur'an Dan Implikasinya Dalam Mencapai Tujuan Pendidikan Islam. *Jurnal Intelektual: Jurnal Pendidikan Dan Studi Keislaman*, *9*(01), 35–52. https://doi.org/10.33367/ji.v9i01.965

Arista, V. A., Rahmah, D. F., Surahman, Harmita, Azizah, N. N., & Aziza, M. (2022). Tafsir Ayat-ayat Neurosains (Nasiyah dalam Qs. AL-ALaq Ayat 15-16). *Jurnal Pendidikan Agama Dan Dakwah*, *2*(4), 309.

Asti Faticha Nurjanah, Hernantito Sulkhan Hakim, M. T. A. (2018). Konsep 'Aql Dalam Al-Qur'an Dan Neurosains. *Nazhruna: Jurnal Pendidikan Islam*, *1*(2), 276–293. https://doi.org/10.31538/nzh.v1i2.83

Fauzan, N., & Shahidan, S. N. (2015). Al-Quran untuk terapi minda dan penyembuhan: Kajian menggunakan quantitative electroencephalograph (qEEG). *Global Journal Al-Thaqafah*, *5*(2), 99–109. https://doi.org/10.7187/gjat942015.05.02

Fischer, K. W. (2009). Mind, brain, and education: Building a scientific groundwork for learning and teaching. *International Journal Mind, Brain, and Education*, *3*(1), 3–16. https://doi.org/10.1111/j.1751-228X.2008.01048.x

Hamzah, M. A. W. A. (2019). Typology of Participants in Perspective Islamic Education Philosophy. *Jurnal Pedagogik*, *06*(01), 1–30.

Hidayat, T., & Syahidin, S. (2019). Inovasi Pembelajaran Pendidikan Agama Islam Melalui

Model Contextual Teaching and Learning Dalam Meningkatkan Taraf Berfikir Peserta Didik. *Jurnal Pendidikan Agama Islam*, *16*(2), 115–136. https://doi.org/10.14421/jpai.2019.162-01

Ibad, K. (2023). Sumber Law Of Attraction (Analisis Al-Qur`an dan Neurosains). *LECTURES : Journal of Islamic and Education Studies*, *2*(1), 22–31.

Ikrar, T. (2016a). *Ilmu Neurosains Modern*. Pustaka Pelajar.

Ikrar, T. (2016b). *Neurosains, Menelusuri Misteri Otak Manusia*. Surya University. http://www.surya.ac.id/viewarticle/3/1/375/Neurosains,_Menelusuri_Misteri_Otak_Manusia

Irawan. (2019). Potensi hibridisasi antara ikan lele dumbo Clarias gariepinus dan ikan sembilang Plotosus canius. *Intek Akualkultur*, *3*(1), 139–148.

Ja'far as-Shodiq, M. (2020). Manajemen Strategis Perguruan Tinggi Islam Dalam Mengintegrasikan Sains Dan Agama (Studi Kasus di UIN Maulana Malik Ibrahim Malang). *Al-Hikmah: Jurnal Kependidikan Dan Syariah*, *8*(1), 133–149.

Jailani, M., Suyadi, & Djabedi, D. (2021). Menelusuri Jejak Otak dan 'Aql Dalam Al-Qur'an Perspektif Neurosains dan Pendidikan Islam di Era Pandemi COVID-19. *Tadris: Jurnal Pendidikan Islam*, *16*(1), 1–19. https://doi.org/10.19105/tjpi.v16i1.4347

Junaedi, M. (2018). Mengkritisi Tipologi Hubungan Sains Dan Agama Ian G. Barbour. *Manarul Qur'an: Jurnal Ilmiah Studi Islam*, *18*(2), 36–63. https://doi.org/10.32699/mq.v18i2.939

Kasno. (2019). Aql dan Otak dalam Kajian Neurosains dan Implikasinya Pendekatan Saintifik dalam Pendidikan Islam. *MUADDIB: Studi Kependidikan Dan Keislaman*, *09*(02), 154–177.

Lubis, M. S. (2018). *Metodologi Penelitian*. Deepublish.

M Abdul Fattah Santoso, A. K. (2018). Tipologi Filsafat Pendidikan Islam: Kajian Konsep Manusia dan Tujuan Pendidikan Berbasis Filsafat Islam Klasik. *Afkaruna*, *14*(1). https://doi.org/10.18196/aiijis.2018.0081.75-100

Mercier, J., Léger, P.-M., Girard, C., & Dion, J.-S. (2012). Bridging the gap between cognitive neuroscience and education: Psychophysiological and behavioral data collection in authentic contexts. *Neuroeducation*, *1*(1), 5–28. https://doi.org/10.24046/neuroed.20120101.5

Narulita, S., Kurniati, D., & Hadiyanto, A. (2021). Efektivitas Pembelajaran Tasawuf Dalam Mencapai Kecerdasan Emosional Dan Spiritual Di Pondok Pesantren Fajar Dunia BOGOR. *Mozaic: Islam Nusantara*, *7*(1), 61-78.

Nasruddin, M., & Muiz, A. (2020). Tinjauan Kritis Neurosains Terhadap Konsep Qalb

Menurut Al-Ghazali. *Syifa Al-Qulub*, *4*(2), 70–87. https://doi.org/10.15575/saq.v4i2.7736

Noor, F. A. (2019). Otak dan Akal dalam Ayat-Ayat Neurosains. *MAGHZA: Jurnal Ilmu Al-Qur'an Dan Tafsir*, *4*(1), 32–52. https://doi.org/10.24090/maghza.v4i1.2329

Nurjannah, S. (2022). Akal dan Qalb Dalam Perspektif Al Qur'an dan Neurosains. *Manazhim: Jurnal Manajemen Dan Ilmu Pendidikan*, *4*(1), 53–65.

Nuryani, D. N. E. S. (2022). Dikotomi Ilmu, Islamisasi Sains Dan Spiritualisasi Human Being Dalam Pendidikan Islam. *CONTEMPLATE: Jurnal Ilmiah Studi Keislaman*, *3*(2), 1–15.

Pasiak, T. (2012). *Antara Tuhan Empirik dan Kesehatan Spiritual*. Centre for Neuroscience, Health and Spirituality (C-NET).

Pasiak, T. (2016). *Tuhan Dalam Otak Manusia: Mewujudkan Kesehatan Spiritual Berdasarkan Neurosains*. Mizan.

Pramono, B., & Ansori, R. W. (2016). Fenomena Hibridasi Sains Dalam Karya Sastra. *Paramasastra: Jurnal Ilmiah Bahasa Sastra Dan Pembelajaran*, *3*(2), 257–274. https://doi.org/10.26740/parama.v3i2.1531

Rofdli, M. F., & Suyadi, S. (2020). Tafsir Ayat-Ayat Neurosains ('Aql Dalam Al-Qur'an dan Relevansinya Terhadap Pengembangan Berpikir Kritis dalam Pendidikan Islam). *JURNAL At-Tibyan Jurnal Ilmu Alquran Dan Tafsir*, *5*(1), 137–151. https://doi.org/10.32505/tibyan.v5i1.1399

Rusdianto. (2015). Interaksi Neurosains Holistik Dalam Perspektif Pendidikan Dan Masyarakat Islam. *Hunafa: Jurnal Studia Islamika*, *12*(1), 71–94.

Santosa, P. (2015). *Metodologi Penelitian Sastra :Paradigma, Proposal, Pelaporan, dan Penerapan*. Azzagrafika.

Sudika, I. W., Sutresna, I. W., Anugrahwati, D. R., & Ujianto, L. (2021). Kajian Sifat Kuantitatif Galur F2 Tanaman Jagung di Lahan Kering. *Jurnal Sains Teknologi & Lingkungan*, *7*(2), 118–134. https://doi.org/10.29303/jstl.v7i2.278

Sudrajat, A., & dkk. (2016). Dinul Islam Pendidikan Agama Islam di Perguruan Tinggi Umum. In *Dinul Islam*. UNY Press.

Susanti, S. E. (2021). Pembelajaran Anak Usia Dini dalam Kajian Neurosains. *TRILOGI: Jurnal Ilmu Teknologi, Kesehatan, Dan Humaniora*, *2*(1), 53–60. https://doi.org/10.33650/trilogi.v2i1.2785

Suyadi. (2012). Model Pendidikan Karakter dalam Konteks Neurosains. *Proceedings Seminar Nasional*.

Suyadi. (2019). Integration of Anti-Corruption Education (PAK) In Islamic Religious Education (PAI) With Neuroscience Approach (Multi-Case Study in Brain Friendly PAUD: I Sleman Kindergarten Yogyakarta). *INFERENSI: Jurnal Penelitian Sosial Keagamaan*, *12*(2), 307–330. https://doi.org/10.18326/infsl3.v12i2.307-330

Suyadi. (2020). *Pendidikan Islam dan Neurosains*. Kencana.

Suyadi, S., & Widodo, H. (2019). Millennialization of Islamic Education Based on Neuroscience in the Third Generation University in Yogyakarta Indonesia. *QIJIS (Qudus International Journal of Islamic Studies)*, *7*(1), 173. https://doi.org/10.21043/qijis.v7i1.4922

Sweller, J. (2020). Cognitive load theory and educational technology. *Educational Technology Research and Development*, *68*(1), 1–16. https://doi.org/10.1007/s11423-019-09701-3

Tommerdahl, J. (2010). A model for bridging the gap between neuroscience and education. *Oxford Review of Education*, *36*(1), 97–109. https://doi.org/10.1080/03054980903518936

Vázquez-Guardado, A., Yang, Y., Bandodkar, A. J., & Rogers, J. A. (2020). Recent advances in neurotechnologies with broad potential for neuroscience research. *Nature Neuroscience*, *23*(12), 1522–1536. https://doi.org/10.1038/s41593-020-00739-8

Wathon, A. (2016). Neurosains dalam pendidikan. *JURNAL LENTERA: Kajian Keagamaan, Keilmuan Dan Teknologi*, *14*(1), 284–294. https://www.neliti.com/publications/177272/neurosains-dalam-pendidikan

Yuliana Alfiyatin, Heriyanto, N. (2020). Efektivitas Pembelajaran Daring Dalam Pandangan Siswa MI Al-Falah Dakiring-Bangkalan. *Al-Ibrah*, *5*(2), 1–22.