

THE HUMAN LEARNING PROCESS BASED ON THE QURANIC PERSPECTIVE AND NEUROSCIENCE AND ITS IMPLICATIONS FOR EDUCATION AND INSTRUCTION

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ABSTRACT

This article reveals the close relationship between the human learning process according to the Qur'anic explanation and the needs of human neural networks in learning as well as the implications that must be applied by teachers and lecturers in the process of education and learning. The purpose of this paper is to reveal the stages of human learning according to the Qur'ān and the stages of the human learning process according to the human brain and the importance of neuroscience applications in the education and learning process. The research method uses library research. Data collection examines thematic verses about learning in the science of *Tafsir Maudhu'i* and examines neuroscience books. The results showed that human learning according to the Qur'ān starts from the process of hearing, proofs, and conviction and human learning according to neuroscience starts from the five senses then sends signals to the temporal lobe, occipital lobe, and parietal lobe then the three lobes are processed in the thalamus and hippocampus and finally sent and processed reciprocally between the hippocampus with the neocortex and prefrontal in the frontal lobe area. The implication for the learning education process is that teachers and lecturers must explain factual teaching materials through visual and tactile media so that students and students can be creative, gain high understanding and strong memory.

Keywords: *Human learning; Neuroscience; Al-abṣār, visual; Tactile sensation.*

INTRODUCTION

Humans learn in their own way. To understand how humans learn, we must ask the creator of humans, namely Allah, the creator of humans from first to last (Surah Yasin/36:90). Allah, who is worshipped and believed to exist by believers, can only be found through the unseen world (Surah Hadid/57:3). Prophets generally used to meet with Allah through dreams (As-Surah Shaffat/37:102) or through voices (Surah Taha/20:11). Unfortunately, the prophet of the last days has passed away, so we cannot get information directly from our prophet. However, humans have faith to know how the human learning process is in the Qur'an. The Qur'an explains the human learning process from not knowing to knowing. Human learning has its own uniqueness and learns based on the needs of its brain. The human learning process has stages and types that are established and standardized both in the perspective of the Qur'an and neuroscience. In contrast, animals can only be educated and trained by humans, and animals do not learn. Western experts mistakenly examine the results of animal experiments in the laboratory on how scientists train animals, then the results of these experiments are taken as cognitive and behavioristic learning theories and then the learning theory is applied to humans.

METHOD

The research approach was qualitative research in the form of library research (Creswell, 2014). There were two sources of data used in this study, namely verses of the Qur'ān about *as-sama'*, *al-absār*, and *al-afidah*, educational books and journals in the field of neuroscience. There were two kinds of techniques used to collect data, are; (a) *Maudhu'iy* method was a way of analyzing the themes of the verses of the Qur'ān related to the human learning process (al-Farmawi, 1977); To obtain data on the human learning process in the Quran, researchers used the thematic method (*maudhu'i*) in tafsir science to track various verses related to the human learning process, then the verses were analyzed according to the context of the verses related to the human learning process. (b) Text analysis method on neuroscience in human learning process in the brain. For obtaining data on the human learning process according to neuroscience, researchers obtained it from reading books and critical reviews of the anatomy of the human brain, brain and human neural networks and then analyzed according to the context of how humans learn.

THE HUMAN PROCESS OF LEARNING ACCORDING TO THE QUR'ĀN

Many verses of the Qur'an explain the need for humans to learn and think about God's creations such as the heavens and the earth, plants, mountains and even humans themselves. However, the only Qur'anic verse that talks about the human learning process is found in Surah an-Nahl verse 78 as follows:

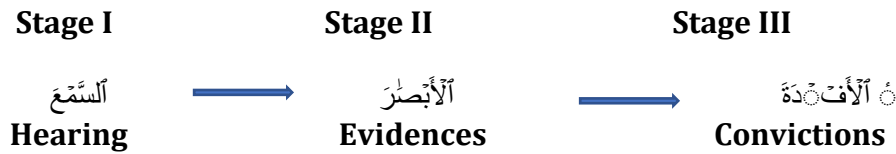
وَاللَّهُ أَخْرَجَكُمْ مِنْ بُطُونِ أُمَّهَاتِكُمْ لَا تَعْلَمُونَ شَيْئًا وَجَعَلَ لَكُمُ السَّمْعَ وَالْأَبْصَارَ وَالْأَفْئِدَةَ لَعَلَّكُمْ تَشْكُرُونَ .

Meaning: And Allah took you out of your mother's womb knowing nothing, and He gave you hearing, proofs and beliefs that you may be grateful (Surah an-Nahl/16:78).

The above verse shows that we humans are consciously born from our mother's womb and come to the earth in a state of ignorance (*lā ta'lamūn shai'an*). Then Allah created the functions of the body organs according to human needs, especially the functions of the organs in the human head. In general, Allah describes three main functions; First, the function of hearing. The mufasirs generally interpret the function of hearing to hear external sounds. Mustafa al-Maraghi calls *as-sama'* (hearing) the function of hearing voices and understanding the content of human conversation regarding matters that are being debated. (al-Maraghi, 1981:238).

Second, evidences function. Umumnya para mufasir mengartikan the word *al-abṣār* adalah melihat, tetapi the researcher means evidence, not only sight, but also mean smell, taste, and touch. This is reinforced by al-Ṭabāṭabā'ī that the function of evidence are sight, touch, taste, and smell (1991: 312 vol. 14). This means that the word *al-abṣār* can be interpreted as seeing, smelling, tasting, and touching.

Third, the function of convictions. The word *al-afidah* generally interprets the heart (Ibn Kathīr, 1991:579), but researchers interpreted evidences. The researcher's opinion was strengthened by al-Rāzī statement, he said hat *al-afidah* is the acquisition of true knowledge and convincing science (al-Qurtūbiy, 1990; al-Rāzī, 1990; al-Ṭabāṭabā'ī, 1991) . Thus the process of human learning in the perspective of the Qur'an human learning requires three stages, namely the stage of hearing, evidence, and convictions. The function of *as-sama'*, *al-abṣār*, and *al-afidah* becomes functions that are mutually integrated with each other to obtain a convincing human understanding. In this case it can be described as follows:



According to the stage scheme above, it shows that the process of human learning according to the Quran sura an-Nahl verse 78 that human learning begins with the process of hearing, then continues with the process of proof, and finally the process of obtaining beliefs.

THE HUMAN LEARNING PROCESS ACCORDING TO NEUROSCIENCE

The human learning process according to neuroscience involves many places (Omrod, 2016; Sherwood, 2010) and Gredler calls the human brain a very complex system involving various levels (2009: 72). Based on the results of reading and observing images of the neural network of the human brain written by Western experts in various books and journals do not have strong similarities on how the human learning process. They have different opinions from each other about the human learning process. First, Jeanne Ellis Omrod. She has a fairly complete book entitled Human Learning. However, she does not clearly say where the human learning process should start and end in the human brain. In her writing she says 'human learning comes from many places in the nerves and the frontal lobe is the most active nerve thinking processing information and events that come from the hippocampus or memory center' (2016; 47). Omrod's confusing writing is supported by 23 researchers from 1989 to 2013, such as Squire, Cacioppo, Byrnes, Shohamy, and so on. They concluded that the most important human learning process is the process of processing information and events in the frontal lobe which originates from the hippocampus.

Second, Margaret Gredler. She wrote the book Learning and Instruction, Theory and Practice. She also did not clearly describe the process of human learning but even she stated from the beginning that the human brain has a complex system. Research results show that human nerves begin to show the interrelated work of neural networks in the first three months in the womb. The development of the human brain is evolutionary from the womb, childhood to adulthood. He said learning starts from acquiring new information from the hippocampus and information from the hippocampus is processed in distant and near neural networks such as the neocortex. The neocortex consists of four lobes and each lobe is involved in processing various information in the brain's neural network. Information from visual results (vision from the eyes) in the thalamus sends signals from the occipital lobe. Auditory information processed in the thalamus comes from the temporal lobe. Information from touch and taste comes from the parietal lobe. All three information that enters the thalamus has a signal communication network with the prefrontal and other brain clumps (2009:79). Thus, the human process of learning to process information into knowledge comes from vision (visual) to the occipital lobe, from hearing (auditory) to the temporal lobe, and from sensation and touch (tactile sensations) to the parietal lobe. All of this information is processed in the frontal lobe and surrounding tissues and final processed in the prefrontal lobe. In summary, according to Gredler that the human learning process starts from the hippocampus but the information of the hippocampus comes from the earliest neural network is not explained.

Third, David A. Lieberman. He wrote the book 'Human Learning and Memory'. He understands the human learning process to be associated with memory. For him,

learning is always related to memory. Learning prioritizes the acquisition of information and memory prioritizes memory, but both will end up in a single system in ensuring the information it has (Liebermann, 2012: 4). This means that the human learning process according to Liebermann is determined by the information obtained and the memory record of an event.

Looking at the three opinions of Western experts shows that their understanding of the human learning process tends to start from the hippocampus or memory storage after which humans utilize the occipital lobe neural network that has sent visual information, then the temporal lobe neural network that sends auditory information, and the parietal lobe neural network from the delivery of tactile sensation information. The three information in the lobe are sent again to the hippocampus as the center of information storage or human memory then the information is processed and processed by the neocortex and finally decided by the prefrontal to determine the truth of science and make plans. Western experts consider the hippocampus and neocortex to have an important role in determining human learning and remembering information and past events into new knowledge and developing creative, innovative thinking and making further plans. To clarify the location of the four lobes in the human brain and the highly complex human neural network can be seen in Figures 1 and 2.

Figure 1

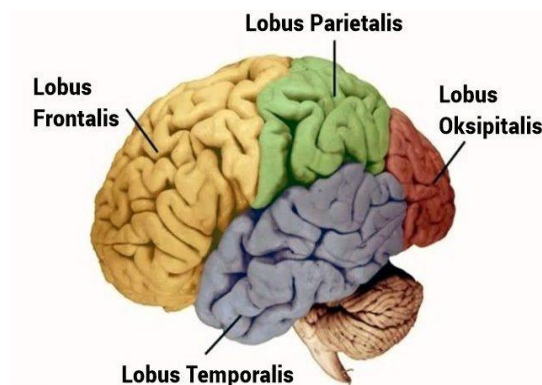
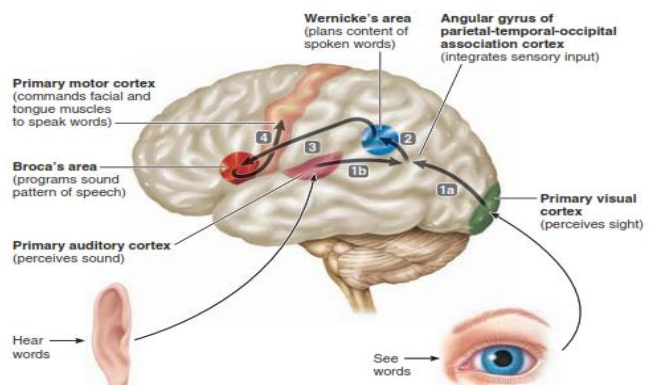


Figure 2



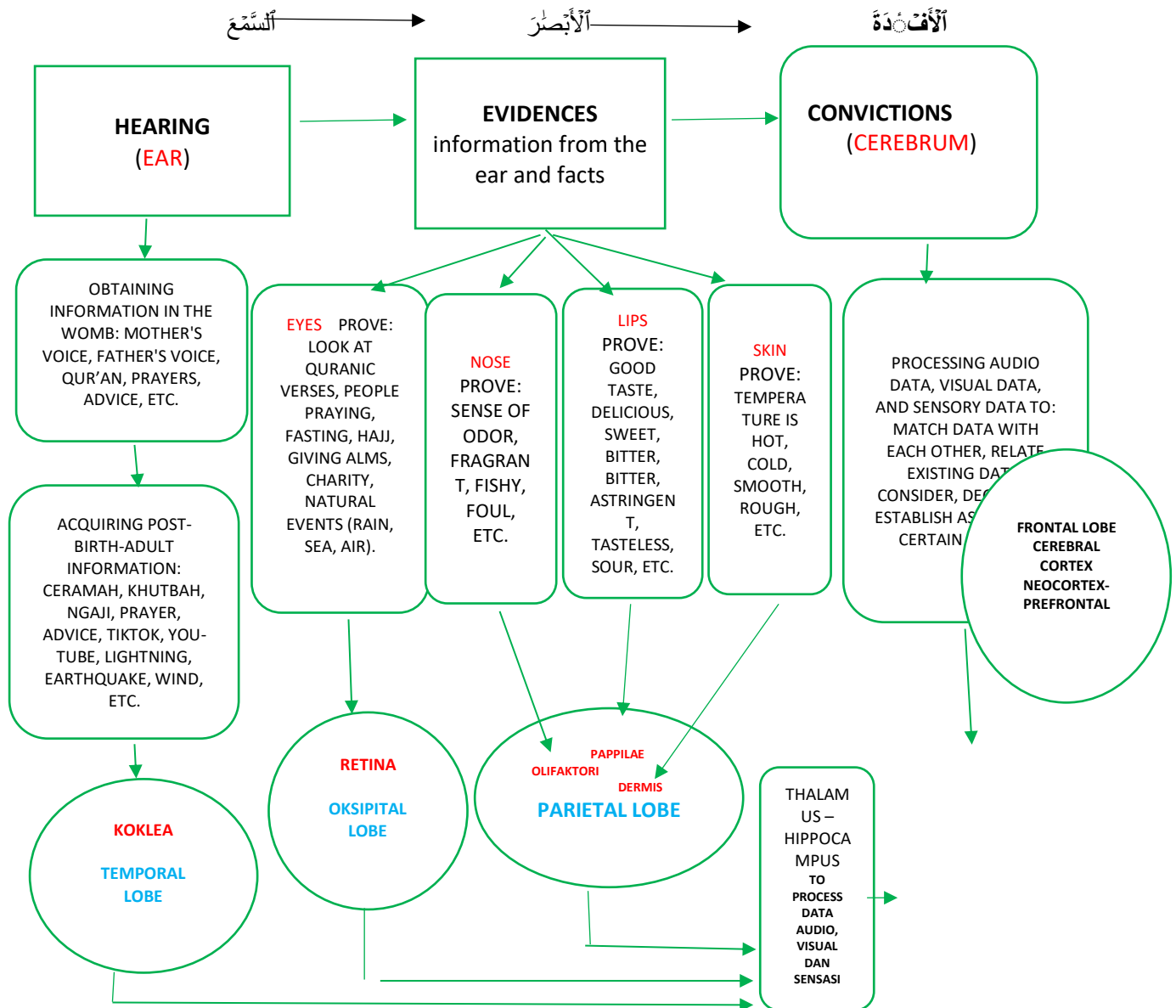
Based on the illustration of Figure 1, it explains that the human cerebrum consists of four parts, namely the temporal lobe, occipital lobe, parietal lobe and frontal lobe. Figure 2 shows the many parts of the human neural network involved in processing information from the five senses to the three neural networks namely the temporal lobe, occipital lobe, and parietal lobe then the information is stored in the hippocampus then the information is processed in the neocortex and finally in the prefrontal. In figure 2, according to Sherwood (2010) that the sound will be processed by the auditory sensory in the cochlea. After that, the input will be transferred to the primary auditory cortex, Wernicke's area, Broca's area, and finally this sound will be sent immediately to the primary motor cortex which activates the muscle of the face and tongue.

THE RELATIONSHIP BETWEEN THE HUMAN LEARNING PROCESS ACCORDING TO THE QUR'AN AND NEUROSCIENCE

Judging from the explanation of the Qur'an that the human learning process starts from the function of hearing (as-sama') through the ears since in the mother's womb, then out of the womb, humans function proofs (al-absār) in the form of chess senses, namely the eyes, nose, tongue and skin which are organs of proof of what has been heard and chess senses prove all facts and events in nature and humans themselves.

Based on the work of the five senses, they send information signals to various lobes or clumps in the neural network in the cerebrum. The ear or cochlear special organ is responsible for sending auditory results to the temporal lobe. The eye or special organ of the retina sends gaze information signals (isual) to the occipital lobe. The nose or olifactory organ, tongue or pappilae organ, and skin or dermis organ all send taste and touch information signals to the parietal lobe.

To clearly understand the relationship between the mutual understanding of the human learning process according to the Qur'an and neuroscience, please refer to the chart below.



Based on the scheme above, it shows that there are three stages of the human learning process according to the Qur'an, namely the stage of hearing, the stage of proofs, and the stage of beliefs. This means that the Qur'an clearly says that the human learning process begins with the function of hearing and then continues with the function of proof by the human chess senses so as to obtain a convincing understanding of the correct science. The three stages of the human learning process can be understood clearly and in detail through the science of human neural networks (neuroscience).

IMPLICATIONS OF HUMAN LEARNING ACCORDING TO THE QUR'AN FOR EDUCATION AND INSTRUCTION

There are two implications of the human learning process according to the Qur'an and neuroscience for the world of education and learning, namely: (a) Prospective teacher students are required to study and understand the knowledge of the human learning process according to the Qur'an and neuroscience. Implications for the world of education and learning. (b) Prospective teacher students need to be given elective courses starting from undergraduate to undergraduate with the following course names: Undergraduate program with the name 'The Concept of Human Learning According to the Qur'an and Neuroscience'. Master program with the name 'Epistemology of Human Learning According to al-Qur'an and Neuroscience'. Doctoral program with the name 'Ontology of Human Learning According to the Qur'an and Neuroscience'.

This practical action research uses a research model from Kemmis and Taggart. Participants in this study were 29 second-grade students, 11 male students and 18 female students. The subject of this research is social study. The study was conducted starting from the pre-cycle and the cycle, where the cycle will be stopped if the minimum student learning outcomes are achieved.

This study uses qualitative and quantitative data analysis (mix method). According to Creswell (2015) one of the most difficult challenges for classroom action research researchers is how to analyze data collected from qualitative and quantitative research. This is more than just connecting or cutting data and numbers, although this relationship does present several challenges. Qualitative data was collected from observations involving the observation protocol, where the observer recorded the performance of the teaching actions of the teacher of the STAD type cooperative learning model he adopted. While quantitative data were collected from tests on student social study learning outcomes.

RESULTS AND DISCUSSION

The Qur'anic information about the process of human learning is very clear but functional and general, starting from the process of utilizing hearing, then the process of utilizing proofs, and ending with the process of utilizing beliefs. The three functions are of course interpreted differently by all humans since the prophet Muhammad died until today. Generally, the mufasirs agree to interpret *as-sama'* as the function of hearing by the ear, but when the word *al-absar* and the word *al-afidah* or *fu'ad* continues to be a difference of opinion. For the word *as-sama'*, we agree that it means hearing and its organ is the ear, which functions to hear various kinds of information. In human neuroscience, the ear organ is the first to start the process of learning to capture sounds, even in modern scientific findings that the ears of babies in the womb already capture the voice of their mothers (Huttenlocher, 1994; Rose, 2005; Gredler, 2009). It must be recognized that the human learning process starts from hearing (cochlea) in the womb. The Quran has explained in general that the first stage of human learning begins through hearing or the ear organ through the special organ of the cochlea that sends information to the temporal lobe nerve network.

After a human being is born from the mother's womb, the chess senses have begun to function, namely the eyes, nose, tongue and skin, which are organs that prove various natural events and events on earth. According Gredler (2009:85) around the age of 8-10 years old, children's memory is active and works together with the prefrontal cortex. Furthermore, the four senses send the results of evidence to two lobes in the brain. The

eye organ in which the retina has a special task of sending learning results to the brain in the occipital lobe. As for the nose in it special olfactory organ, the tongue in it special organ papillae, and the skin in it special organ dermis all the results of the proof of taste and touch to the brain in the parietal lobe. The results of information received in the temporal lobe and the results of gaze received in the occipital lobe as well as the results of taste and touch received in the parietal lobe are all sent back to the thalamus and then processed in the hippocampus to be stored as long-term memory. In Omrod (2016) the hippocampus functions to process declarative memory, which is a type of memory derived from specific facts or events. All memory in the hippocampus comes from the parietal lobe, occipital lobe and temporal lobe. The maturity of human memory starts at the age of 20 (Gredler, 2009:77, 79). According Gredler that the human learning has a strong understanding of the obligation to touch by the dermis what is the object or objects as a source of strengthening knowledge which is then sent a signal to the parietal lobe (2009:79). Nevertheless, characteristics of adult learning include actively engaging to debate and challenge ideas using audience response system techniques (Prakash, et al., 2019). However, this way of learning lacks long-term memory or convincing knowledge. Therefore, to create comfortable learning conditions in which each student can feel his success and intellectual competence, which will allow him to simulate life and professional situations from pedagogical practice, to find a solution to the problem based on an analysis of the circumstances and the corresponding situation; to contribute to the formation of professional skills and abilities, to cultivate humanistic values in him, help to create an atmosphere of interaction and cooperation (Kariyev, et al., 2020).

Finally, thanks to the work of the cerebellum consisting of the temporal lobe, occipital lobe, and parietal lobe, information is sent to the hippocampus and then processed again in the frontal lobe neocortex and prefrontal to obtain decisions and confidence in the truth of science and planning ahead. In this case, the frontal lobe is the most active neural thinking processing information and events (Omrod, 2016), and the prefrontal cortex is the last brain area to mature and is involved in goal setting and planning (Gredler, 2016). Thus, learning, then, is not a single process but a family of different processes that occur in the sequence of experiences we have in the course of our daily living - it is about our being and becoming in a lifetime of learning (Jarvis, 2012:21). In relation to the human process of learning, the Qur'an has a consistent and very clear stage-by-stage information starting from the hearing stage (*as-sama'*) followed by the proof-proof stage (*al-absar*) and ending with the belief-belief stage (*al-afidah*).

CONCLUSION

Indeed, the human learning process comes from the five senses then sends to the brain. In the perspective of the Qur'an, there are three stages of the human learning process, namely the stage of hearing (*as-sama'*), proofs, and beliefs (*al-afidah*). These three are explained in detail in neuroscience. First, the hearing process. The organ that functions to hear is the ear and the cochlea is the organ that sends the results of auditory information to the brain in the temporal lobe. Second, the proofs. There are four organs that attest the information from hearing: eyes, nose, tongue and skin. These four organs send the evidential results to the two lobes in the brain. The eye organ in which the retina has a special task of sending the results of visual information (gaze) to the brain in the occipital lobe. The nose has a special olfactory organ in it, the tongue has a special papillae organ in it, and the skin has a special dermis organ in it, all of which

send the results of taste and touch to the brain in the parietal lobe. The results of hearing information received in the temporal lobe and the results of gaze received in the occipital lobe and the results of taste and touch received in the parietal lobe are all sent back to the thalamus and then processed in the hippocampus to be stored as long-term memory. Third, beliefs. The organ that functions to process all the information stored in the hippocampus is the large brain, namely the frontal lobe, which is preceded by the neocortex and cerebral cortex and ends at the prefrontal. The prefrontal is the neural network that concludes the process of the final results of human learning to be brought to the broca area and the tongue emits the sound of knowledge to other humans.

Indeed, information about the process of human learning in the Qur'an is explained in general and is textual informative functional. While neuroscience explains the process of human learning in detail and complex physical and functional integrative.

This conclusion recommends to the committee that given the importance of understanding and learning the science of the human learning process according to the Qur'an and neuroscience, this material should be included in the curriculum of the Faculty of Tarbiyah and Keguruan as an elective course for all prospective educators and learners so that they know the needs of students' brains when they learn.

AUTHOR CONTRIBUTIONS

Syukri reads books related to the human learning process in the Qur'an then writes an abstract and describes the human learning process in the Qur'an and makes a scheme of the relationship between human learning in the Qur'an and neuroscience.

Muhsinul Ihsan read books related to the human learning process according to neuroscience then wrote it.

Jamaluddin reads books related to the human learning process in the Qur'an then writes an addition to the human learning process according to the Qur'an and writes a conclusion.

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