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Critical study of the concept of scientific hybridization of islamic education and neuroscience

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ARTICLE INFO	ABSTRACT
<p>Article history Received: 10 January 2023 Revised: 26 July 2023 Accepted: 03 September 2023</p> <p>Keywords: Critical Study Hybridization Neuroscience of Islamic Education</p>	<p>Critical study of Islamic Education Neuroscience is still not sufficiently carried out in accounting for its knowledge, in order to confirm and fill in gaps in its scientific development. The purpose of this study is to examine the various scientific varieties of Islamic Education Neuroscience using the epistemology of Islamic Education, in order to find, fill, and develop their scientific potential, also from the perspective of developing hybridization of other Islamic Education scholarships. The method used in this study uses a qualitative type of literature according to Creswell: 2015, meaning that it is processed from various kinds of analytical theory from various sources of literature. The results of the study show that Islamic Education Neuroscience in epistemology also refers to Islamic law. Epistemologically, Irfani refers to the background of the scientific dichotomy between neuroscience, education, and Islam. Epistemologically, Burhani refers to empirical facts about the importance of collaboration between Islamic educators and neurologists in designing curricula and learning that optimizes students' brains in achieving Islamic education goals. Referring to the hybridization of other disciplines such as anthropology and psychology of Islamic education, this scientific development can further deepen the derivatives and clusters knowledge and more adapted to the needs of students.</p>

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INTRODUCTION

The background of this research is due to the lack of studies on knowledge that has been hybridized, between Neuroscience and Islamic Education, which has resulted in a new scientific variety, namely Islamic Education Neuroscience (Suyadi, 2019). It is like the hybridization of other sciences such as psychology and Islamic Education which produces varieties of psychology in Islamic Education, or the science of anthropology and Islamic Education which produces varieties of scientific anthropology of Islamic Education, where both scientific varieties have experienced development and their scholarship is more epistemologically accountable in Islamic Education (Hadi, 2017) (Nasution, 2017). The area that is still often wrong in the world of education is to assume that the purpose of education is to form critical thinking, such as the ability to memorize, re-elaborate, answer without the need to seek re-information, but in the perspective of Islamic Education more than that, which plays an active role in shaping the personality of the participants. students as provisions for life in this world and in the hereafter (Suyadi et al., 2022a) (Wahyudi et al., 2020). The implementation of the world of education itself mostly considers the realm between the brain or thinking with the body as well as the heart-feeling in the brain claimed to be dichotomous, so that the structure of the education system mostly emphasizes for students to use their thinking brains in forming personality only (Widodo, 2018) (Sutarman, 2020). Neurologists have formulated the scientific role of the brain to be integrated with various branches of science, one of which is Islamic Education, but the fact is that brain science is not fully maximized, with a passive response in the world of education (Suyadi, 2020). The science of the brain is in neuroscience (Ahrens, 2019), while the realm of holistic education is in the science of Islamic Education (Hamami & Nuryana, 2022), the hybridization of the two has resulted in Islamic Education Neuroscience which has found a correlation between the two such as the concept of *nasiyah* (crown) and *aql* (mind) in the Koran has a correlation with the brain and mind in neuroscience (Suyadi, 2019), however, the scientific varieties of Islamic Education Neuroscience have not been critically examined in order to assess their scientific credibility. Therefore, the narrow integration between Neuroscience and Islamic Education, causes Islamic Education to only focus its knowledge on character education and/or academics, where it increasingly seems that the learning it brings feels dogmatic, and is dichotomous with other scientific developments.

Studies on the Brain in Islamic religious literature are lacking, because Islam specifically in its teachings uses the term Intellect more (Ahrens, 2019). The meaning of the brain is the physical object of an organ of the human body, while reason is the ability of thought to process the information it receives in a complex manner (Nurjanah et al., 2018). The study of the brain in the world of education is actually not a special competence for educators, because brain science is the work of neurologists, but the fact is that educators are also responsible for changes in the development of students' brain potential (Sousa, 2012). So brain science is also a competency that educators should master. The existence of a new scientific hybridization between neuroscience and Islamic Education is a new concept that needs to be studied in depth, in order to assess the scientific credibility in it. Further examining the scientific varieties of Islamic Education Neuroscience, the researcher refers to several relevant previous studies to bridge the novelty of research. *First*, research that examines the concept of hybridization varieties Islamic Education Neuroscience can be aligned with other scientific hybridizations such as Islamic Education Philosophy, Islamic Educational Anthropology, Islamic Educational Psychology, as well as other Islamic Education scientific hybridizations (Suyadi, 2019). *Second*, research on the Neuroscience of Islamic Education which examines its references to religious texts (Suyadi et al., 2020). *Third*, research on the study of Islamic Education Neuroscience that is millinealized in higher education academic units (Suyadi & Widodo, 2019). Therefore, the direction of this research study is based on previous research in view that the variety of hybridization of the Islamic Neurosciences in Islamic Education has been internalized and studied on the basis of comparative hybridization of other sciences, so the research study can be further deepened by confirming the existing knowledge based on normative principles in Islamic education.

The purpose of this study is to examine in more depth related to the varieties of hybridization of Islamic Neuroscience in Islamic Education, whether the scientific knowledge can be verified in terms of normative principles in Islamic Education. Scientific standards that examine how a science is referred to are the realm of educational epistemology, which examines the importance of a science referring to statements, axioms, laws, principles and rules, the critical basis of knowledge and the relationship between these laws and educational praxis. Epistemology of Education also emphasizes how science

refers, includes certain types and methods of knowledge. So the epistemology of education is a form of critical analysis of the concepts, principles and laws of education (Avram, 2015). Furthermore, the study of epistemology in the perspective of Islamic Education means study in referring to revealed knowledge, so that the nature of the epistemology of Islamic Education is pragmatic because the combination of knowledge and revelation is not dichotomous (Hassan et al., 2010). At least the concept of epistemology in Islamic literature is divided into three, such as bayani epistemology which refers to its knowledge of Islamic references textually, next is irfani's epistemology which originates from the intuition of the deep inner experience of an individual, while the last is burhani epistemology, which relies on a principle normative law on empirical data, in the sense that it can be scientifically tested to date (Dimiyati et al., 2021). The epistemological conception of Islamic Education with its derivatives in the realm of bayani, irfani, and burhani epistemology is used as a framework for critically examining the varieties of scientific hybridization of Islamic Education based on the theories that have been born from them.

This research is important because with a critical study of the concept of hybridization between neuroscience and Islamic Education which produces a new scientific variety in the form of Islamic Education Neuroscience, it can be used as a reference and benchmark in standardizing his knowledge (Suyadi, 2018b). Examining more deeply the Islamic Education Neurosciences so that it can be accounted for based on normative standards of Islamic Education epistemology. Making a reference for each unit involved in Islamic Education to be able to understand the science of Islamic Education Neuroscience comprehensively (Suyadi, 2018a). Understanding a science thoroughly will result in advancing the level of education (Sutarman et al., 2022). At the same time reviewing the standardization hybridization of other Islamic Education scientific varieties, whether Islamic Education Neuroscience can be aligned with Islamic Education anthropology (Hidayat & Bustam, 2022), Islamic Education psychology (Sutarman, 2021), Islamic Education philosophy (Hambali, 2019), and various other Islamic Education scientific hybridizations.

METHODS

Research Design

The research used in this study used qualitative liberal research. Library research research according to Creswell: 2015 has an understanding in which researchers connect between theories from various academic literature in validating the data of their research findings (Creswell, 2015). So the researcher will narratively confirm related aspects that already exist in Islamic Education Neuroscience with a variety of theories in the epistemology of Islamic Education, in order to explore a variety of knowledge normatively. The review is carried out by contextually interpreting various theories about the Neuroscience of Islamic Education with the epistemology of Islamic Education, so that it can be examined how this variety of scientific hybridization of Islamic Education Neuroscience accounts for renewal, which collides positivist scholarship with pragmatic scholarship.

Data Source

The data source of this research is based on the collective primary and secondary data. Primary data is a source of a variety of relevant literature in research, such as books, journal articles, expert opinions, and so on, which are then processed using a particular methodology. while secondary data is data obtained not as processed main data, but still used to strengthen primary data (Sugiyono, 2020). For this reason, the primary data in this study were obtained from a framework reference in the epistemology of Islamic Education, consisting of bayani, irfani, and burhani. So the limitation of data in Islamic Education Neuroscience consists of how this science refers to legal sources in Islam, such as the Qur'an, Hadith, Ijma, and Qiyas based on bayani epistemology. Then, epistemologically, Irfani relies on individual experience or kebatinan in referring to knowledge personally, the implications are based on how the journey and scientific background of Islamic Education Neuroscience discovers its novelty, whether it is coherent and clustered from the basic scientific theories. Meanwhile, Burhani's epistemology reviews how this knowledge can be accounted for empirically and scientifically, in order to prove the scientific level of knowledge that is already pragmatic. The main guideline for digging up primary data to review the epistemology of bayani, irfani, and burhani comes from a book entitled "Islamic Education and Neuroscience, Tracing the Tracks of the Mind and Brain in the Qur'an to the Development of Neuroscience in Islamic Education" by Professor Suyadi in 2020 (Suyadi, 2020).

Secondary data was obtained based on relevant literature related to how neuroscience develops, reviewing dynamics knowledge based on the treasures of Islamic education. Therefore secondary data is obtained from various reference books, journals, expert opinions and so on related to the scientific dynamics theory of Islamic Education Neuroscience.

Research Procedure

The research procedure which is used as a coherent reference for scientific guidelines consists of several stages: (1) analyzing various relevant literature data related to existing theories on the epistemology of Islamic Education and scientific treasures in the scientific varieties of Islamic Education Neuroscience; (2) the data that has been collected is then sorted based on detailed themes in their respective classifications, around the epistemology of Islamic Education and its derivatives as a framework and data limitations from the theory to be studied in the Neuroscience of Islamic Education, consisting of the epistemologies of bayani, irfani, and burhani; (3) the set of data limitations that will be studied in the scientific varieties of Islamic Education Neuroscience and then analyzed how this scholarship refers to sources of Islamic law, subjective scientific experience based on a scientific background on its basic theories, and how this scholarship accounts for empiricism or the scientific realm; (4) carry out the analysis repeatedly until it is considered that the processed data is saturated with reference to the epistemological derivative framework of Islamic Education, then the final conclusion of the research is drawn.

RESULTS AND DISCUSSION

Fundamentally, Islamic scholarship has a big role in the world of education (Suyadi et al., 2022b). Islam has a meaning as a divine religion, revealed to the Prophet Muhammad, through the intermediary of the Angel Gabriel. Humans have a purpose in their creation as *khalifatullah fil ardh* (Saihu, 2022) (Watsiqotul et al., 2018). The development of the world of science itself has long existed in Islamic history, as did the rise of the world of Islamic science during the Daulah era The Abbasids, who took part in providing a model of civilizational order for Muslims in accordance with the rules of Shari'a, raised the awareness of the people, and helped create a civilized society (Tite et al., 2015) (Wibowo, 2021). Along with the development of the times from time to time, Islam is also increasingly experiencing developments in various scientific sectors (Kiliyamannil, 2023)

Science in Islamic Education is also experiencing rapid progress as a form of integration of various existing knowledge. The integration of Islamic Education into various scientific sectors is important in alleviating all problems and achieving the ideals of forming a civil society (Charis & Nuryansah, 2015). However, the problem of integrating Islamic Education with various scientific studies is not as easy as turning the palm of the hand (Mustaqimah & Suyadi, 2023). One of the problems of Islamic Education in integrating science is the view of positivism. The school of positivism philosophy assumes that science is absolute truth if it is empirical, so this concept separates itself from metaphysical science (Irawati et al., 2021). These obstacles can be seen from Islamic studies, some of which cannot be sensed by humans, such as heaven and hell. On the other hand, with positivism, some Islamic groups are still open-minded, prioritizing revelation without maximizing reason, so that it is static or frozen, in the sense that becoming old-fashioned exacerbates conditions (Nasir, 2018).

Science in history always finds its own way, when it proves the truth of science. Like the debate between Einstein and Bohr, a physicist who also doubles as a philosopher. Their view of positivism changed when they discovered the law of uncertainty in natural science, or quantum physics, where a particle is in an uncertain state until a measurement is made, in fact the wider the parameters the narrower the reality. The debate about unmeasurable natural conditions became metaphysical, so that Bohr and Einstein brought the name of God in their debate (Damanik, 2022) (Coko, 2015). Indications of the debate between Einstein and Bohr show that not everything can be measured by natural science or logic.

The gap between sciences poses a challenge for Islamic Education to be able to merge general knowledge and religion (Suyadi, 2019). Therefore, merging general science with Islamic religious knowledge must immediately find a meeting point. Fusion in the concept of integration means all forms of merging of several concepts into one with the division of each corridor (Awaliyah et al., 2021). Therefore, the concept of integration between general knowledge and the Islamic religion must be bridged from awareness of changing mindsets. Changes lead to awareness of the Islamic world which is

increasingly left behind and is looked down upon as the mecca of western scholarship. It is time for Islamic scholarship, including Islamic education, to study not only matters of worship, but also natural sciences such as science and the like. It also applies to science without revelation which means blind, where Islamic Education and general science must throw away the dichotomy between the two (Hamami & Nuryana, 2022), the point is don't get stuck in a secularistic view.

The development and dynamics of science in the study of neuroscience has actually penetrated into many fields, such as the field of working on law using forensics in neuropsychology, as a form of integration of neuroscience and psychology (Leonard, 2015). Integration of neuroscience with economics as well, such as how to respond to the economy from a neuroscience perspective (Bashir et al., 2023). Even up to the realm of integration of theological scholarship which engages in dialogue between religion and neuroscience in neurotheology (Klemm, 2022)

This section is the main part of the research result article in which the fix results are served. The data analysis processes, such as statistical computing and hypothesis testing, are not necessary to be served. The materials reported are the analysis results and hypothesis testing results. In addition, tables and graphics are also can be showed to enunciate the verbal narration. Tables and images must be given comment or discussion. The details of qualitative research written in some sub-topics which directly related to the focused category.

The discussion of article aims to: (1) answer the problems and research questions; (2) show the ways the findings obtained; (3) interpret the findings; (4) relate the finding results to the settled-knowledge structure; (5) bring up new theories or modify the exist theories. Research results must be clearly concluded in answering the research questions. Interpreting the findings should be done by using logics and present theories. The findings in form of facts found in the research fields are integrated to previous research or present theories. This must be supported by reliable references. In case the researchers bring a new theory, the old theories can be confirmed or rejected, or modify the old theories. In some cases, it is unavoidable to organize an article by making sub-headings. Thus, this is the format to write Biosferjpb manuscripts with sub-headings. In this section, there are specific rules which cannot be separated in an article. This research examines how the form of integration of Neuroscience or brain science with Islamic Education. The integration of the development of the two must pay attention to the rules of the nature of Islamic teachings. According to Anar Anshori contains the main Islamic teachings that are dynamic, called *mutaghayyirat* which means as a teaching that may be developed as long as it does not violate the rules of Shari'a (Anshori, 2019). Indicates that the science of Neuroscience, even though it is empirical science, still may not collide with the rules of Shari'a. The epistemological theory of Islamic Education states that at least in the scientific realm, in order to be accountable, it should go through three forms of verification, namely bayani , burhani and also irfani epistemology (Dimiyati et al., 2021).

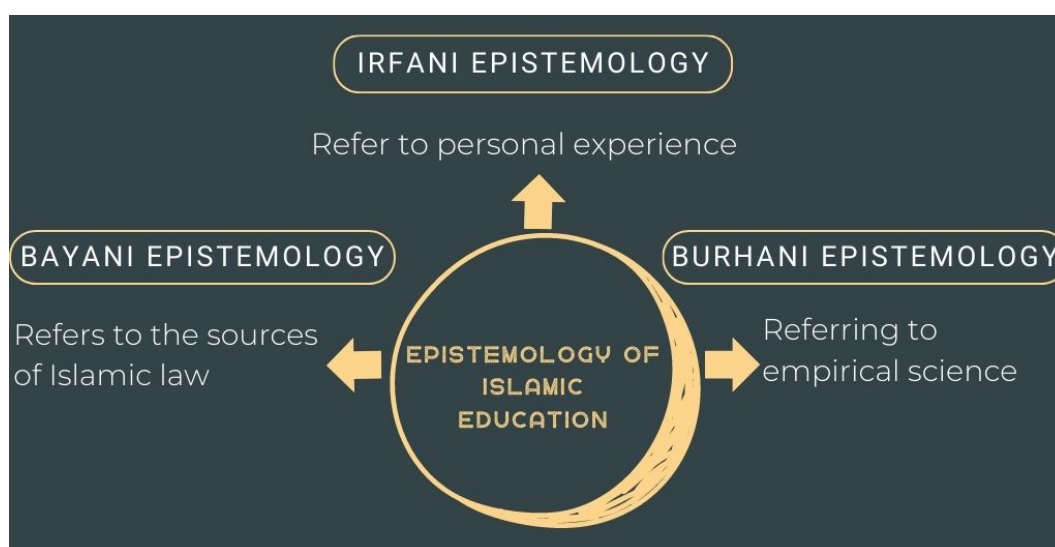


Figure 1. Epistemology of Islamic Education

Bayani's epistemology means seeing that scholarship must have references from legal sources that are clear and accountable, such as valid verses from the Qur'an and Hadith. Then, Irfani's epistemology views that scientific references also come from personal experience, so that knowledge is

inherent in subjective treatment and touch. The last is burhani epistemology which refers to science which must be proven empirically. So the nature of the epistemology of Islamic Education is pragmatic, because it combines religious scholarship with scientific science.

Referring to the epistemological framework of Islamic Education, the scientific treasures in the Neuroscience of Islamic Education have several details, which at least can be used as a benchmark for scientific standardization. The first aspect in Islamic Education Neuroscience is about how this science refers to legal sources from Islam, meaning the basis of revelation as a benchmark for the scientific development of Islamic Education Neuroscience.

Neuroscience was born after an urgency emerged that dichotomized the science of the brain and Islamic education (Indarwati et al., 2021). The existence of this knowledge provides a new discourse in the world of education, such as educators to be able to maximize students' brain function, but still based on normative Islamic teachings (Suyadi, 2019). After the emergence of this science, now a new question arises, has Islamic Education Neuroscience answered the problem of dichotomy in education? Can neuroscience be accountable for its knowledge, both in terms of Islamic teachings and empirical science? For this reason, it is necessary to review this scholarship based on how it refers to sources of Islamic law, personal experience, and empirical science.

Reviewing the Neuroscience of Islamic Education based on its reference to sources of law in Islam means studying the foundation of revelation contained in the science of Islamic Education Neuroscience. Based on the treasures in Islamic Education Neuroscience there are traces of brain science studies in surah Al- Alaq verses 15-16 (Suyadi, 2020).

كَلَّا لَئِن لَّمْ يَنْتَهَ لَنْسَفَعْنَا بِالنَّاصِيَةِ, نَاصِيَةٍ كَاذِبَةٍ خَاطِئَةٍ

"Know, indeed if he does not stop (doing so) surely We will pull the tops of his head, (ie) the tops of those who deny and are disobedient". (QS. al- Alaq: 15-16)

The use of the word "nasiyah" which means fontanel in this verse means brain, because the term "brain" did not appear in the VII century AD, so the mention of it in the language of kalam is fontanel (Suyadi, 2019). In human neurobiology, the part of the brain located at the top of the head is the prefrontal cortex (Herbet & Duffau, 2020). The function of the prefrontal cortex itself is for verbal expression, memory, analysis of abstract matters, and examining the spatial relationship between oneself and one's environment (Friedman & Robbins, 2022). So that the meaning of *nasiyah* which means the crown is another meaning of the brain, which in neurobiological studies is called the prefrontal cortex. This verse is one of the proofs of scientific reference in Islamic Educational Neuroscience which is based on Islamic law, as contained in the Al-Qur'an.

As a scientific group, Islamic Education Neuroscience has roots in the fields of work and basic theories that bridge the birth of this science. The basis for the coherent experience of the scientific varieties of Islamic Education Neuroscience is based on the basic aspects of neuroscience, education, and Islam (Suyadi, 2020). According to Suyadi, it started from the scarcity of integration studies between neuroscience and Islamic education resulting in a loss of references and information to educators on the performance mechanisms of students' brains, so it is tantamount to damaging students' brains (Suyadi, 2019). Therefore scientific integration is important in the hope that it can add references and scientific treasures, especially for educators on Islamic Education Neuroscience. The emergence of Islamic Education Neuroscience began with a scientific bridge between neuroscience and education in general, then a new docking was carried out with the variable Islamic Education, to become the Neuroscience of Islamic Education (Suyadi, 2020).

Then the realm of empiricism from Islamic Education Neuroscience is a manifestation of the Islamization of science, peng Islamic scientists, as well as integration-interconnection. If Al- Faruqi carried out the Islamization of science (Rahman, 2015), and Kuntowijoyo carried out the Islamization of education (Inayati & Pratama, 2022), and Taufiq Pasiak carried out the Islamization of neuroscience (Pakaya et al., 2017), then Suyadi initiating the overall integration-interconnection study in the scientific variety of Islamic Education Neuroscience (Suyadi, 2019). So that it becomes a science that can be accounted for scientifically because educators, Islamic scholars, and neurologists must collaborate with each other to create curriculum and learning designs that optimize the potential of students' brains, in order to form a generation of excellent human beings. As is the case on the one hand educators are in

classrooms to design Islamic learning, but also on the other hand educators are in neuroscience laboratories . Scientific hybridization produces learning practice designs that print Islamic learning content based on optimizing students' brains. An example of learning that can be applied in Islamic Education Neuroscience is optimizing the prefrontal cortex, which in neurophysiology functions as verbal expression, memory, analysis of abstract cases, and examining the spatial relationship between oneself and one's environment. So educators can stimulate students by providing stimulation to be able to ask as many questions and as comprehensively as possible about Islamic studies and science, thus optimizing students' prefrontal cortex.

Based on scientific verification of the theory of Islamic education epistemology, which includes bayani's epistemology on how to refer to sources of Islamic law, irfani's epistemology on how to refer to individual experiences of clusters of studies that are subjectively inherent, and burhani's epistemology on how knowledge can be proven scientifically, then Neuroscience Islamic education has met scientific standards in it. It is proven that Islamic Education Neuroscience has references in Islamic law as the concept of "*nasiyah*" or forelock which means brain in the Qur'an. It is proven that the background to the establishment of science is based on the urgency of the dichotomy between neuroscience education, and Islam, so that the birth of science makes new varieties of referrals and references to Islamic Education in overcoming the problem of the lack of optimization of students' brains. It is also proven that the study of the brain and Islamic Education is a scientific realm in supporting the growth and development of the brains of students in order to form good human beings, by elaborating the knowledge of both in designing curriculum and Islamic Education based on optimizing the students' brains.

Table 1.

Epistemology Study of Islamic Education in the Neuroscience of Islamic Education

	Islamic Education Neuroscience
Bayani Epistemology	Has references to sources of Islamic law as surah Al-Alaq verses 15-16. The word <i>nasiyah</i> which means forelock also has the meaning of the brain prefrontal cortex in neuroanatomy.
Irfani epistemology	Having a scientific background that is dichotomous between neuroscience, education, and Islam, thus giving birth to a variety of scientific hybridization in the form of Islamic Education Neuroscience
Burhani Epistemology	Educators are proven to need a learning design that aims to shape students as a generation of excellent human beings by collaborating on neuroscience and Islamic Education, in order to optimize students' brains in achieving the goals of Islamic Education

By verifying the epistemology of Islamic Education, Islamic Education's Neuroscience has been proven. In order to further develop the hybridization of neuroscience and Islamic Education which has become a new scientific variety in the form of Islamic Education Neuroscience, a review of other scientific hybridization varieties such as Islamic Educational Psychology and Islamic Educational Anthropology can be carried out. The review of the hybridization of Islamic Education scientific varieties is broadly intended to find a point of emptiness that still has the potential to be placed in the Islamic Education Neuroscience, as a development.

Reviewing Islamic Education Anthropology in meaning, means that anthropology is a scientific unit that examines the forms of culture contained in the order of human life, such as economics, religious beliefs, politics, the human body, science and technology, and so on which are fields of scientific work. anthropology. Islam in looking at anthropology has a goal in studying the form of religious implementation which is the order of human life in society. Conformity between human and religious cultural systems is a field of work on Islamic Educational Anthropology. The way that can be taken in the scientific anthropology of Islamic Education is by carrying out a scientific organizing mechanism (Parni, 2020).

Examining science specifically in Islamic Educational Anthropology, based on its scientific perspective it has compatibility in describing the Islamic religion and anthropology that have been recognized scientifically, one of which is the concept of human nature whose existence has been made a field of work on the study of Islamic Educational Anthropology. When this scientific variety is brought to the field of academic work, then cultural attitudes should be highlighted when implementing

education, such as educators, students, educational goals, learning media methods, and so on (Wicaksono, 2016) (Firmansyah et al., 2023).

Looking at various theories regarding Islamic Educational Anthropology, it is found that the field of work on Islamic Education Anthropology has been organized based on the clarity of its broad field of work and has been divided with a systematic focus on scientific details. An indication of his thorough scientific focus on broad aspects of life, both family, social and academic education. Especially in the focus of Islamic Educational Anthropology in the academic scope, it still pays attention to the rules of the existence of cultural and Islamic religious conformity that are appropriate and maintained in all aspects of teaching and learning (Wicaksono, 2016).

Further reviewing the Psychology of Islamic Education. By definition psychology is a science that discusses the study of human behavior, along with its relationship with each other. In the scientific variety of Islamic Educational Psychology there is also compatibility between psychology and Islamic scholarship, such as the concept of *bio- sociopsychic -spiritual* in psychology which means that humans as creatures are physiologically so limited, therefore humans live socially and acknowledge the potential of the role of the spiritual aspect of God's existence (Mansir, 2018) (Daulay, 2014).

Positioning Islamic Educational Psychology which also has broad coverage of scientific details, this has implications for the direction of scientific varieties of Islamic Educational Psychology which are thoroughly integrated in everyday human life, regarding awareness of behavior and relationships with other parties. Forming a mind-full human mindset, what he is doing, what he has done, and what he will do, all have an order in an Islamic perspective (Masduki et al., 2019).

The suitability of the fields of work from Psychology and Islamic Education provides an opportunity that his knowledge is also integrated with other scholarships, because it also discusses the *qalb* or heart, as well as consciousness or mind which is called *aql* in Islam and psychology. The theory of Islamic Education Psychology indicates that its scientific varieties have developed and been recognized epistemologically in Islamic Education because it has been proven in theory and also in practice. The development of this science provides a form that learning can be more emphasized on the full daily mobility of students. So that learning is more adaptive to the needs of students.

After seeing various perspectives of hybridization of other Islamic Education scientific varieties, each scientific development can be used as an appropriate approach to develop scientific hybridization varieties of Islamic Education Neuroscience. Contextualization of the development concept variety the hybridization of other Islamic Education scholarships into the Islamic Education Neurosciences is carried out by looking for everything that can and is suitable if placed in this science, in order to fill the gaps in the Islamic Education Neurosciences. As found in other scientific hybridization studies, Islamic Education Neuroscience can be more detailed in the derivatives of its scientific varieties and better adapt learning designs to suit the needs of students.

The Neuroscience of Islamic Education, even though scientific accountability can be proven epistemologically in Islamic Education, dichotomies still occur in science. The dichotomy in the science of Islamic Education Neuroscience occurs by the implementation of science in educational units that have not felt its scientific impact in alleviating educational problems. Thus, as with other varieties of hybridization of Islamic Education scholarship, studies are needed that lead to emphasizing the application of science that can be felt to be beneficial in overcoming unresolved problems in Islamic Education. Also one of them is by continuing to develop Islamic Education Neuroscience by proving the theory of scientific suitability contained in Islamic scientific studies.

The application of Islamic Education Neuroscience can be done by reviewing the institutional dimension in the Islamic Education unit to not only study the development of the theory of Islamic Education Neuroscience, but also its application which must be truly internalized to address educational problems. As with other varieties of hybridization of Islamic Education sciences, they already have a clearly defined field of scientific study both in the scope of academic (Ramadan et al., 2022), community, and family education which is also included in the field of working on education in the Three Education Centers, in order to maintain educational stability from all aspects. As an example of optimizing neuroscience into Islamic Religious Education using the brain-based learning or BBL method, regarding optimizing instructional approaches to learning neurolinguistic forms of right and left brain function (Handayani & Purwati, 2022), which if the method is applied in PAI learning will make it possible to increase student learning resistance. Another development that still has potential in Islamic Education Neuroscience is the need to carry out interconnection integration by directly referring to other Islamic

Education scientific hybridizations so that the scientifically referred to directly can be accounted for epistemologically in Islamic Education, like interconnection integration with Islamic Educational Psychology scholarship which also examines the role of *aql* and *qalb* in the study of human emotion, because also in the Neurosciences of Islamic Education also examines the same theory.

CONCLUSION

The scientific variety of Islamic Education Neuroscience is a study of brain or neuroscience that is studied in the field of working on Islamic Education, one of which aims to manage Islamic Education scientifically to optimize the potential of the human brain in the field of working on education. Scientifically, the epistemology of Islamic Education is between bayani, irfani, and burhani Islamic Education Neuroscience can already be accounted for because there is already scientific suitability in it. Bayani epistemological studies show that Islamic Educational Neuroscience is also based on the Qur'an, as the concept of *nasiyah* which means forelock also means the brain or prefrontal cortex in neurobiological studies. Irfani's epistemology states that this science is motivated by a dichotomy between neuroscience, education, and Islam. then epistemologically it is scientifically proven that this knowledge is important for collaborating Islamic educators with neurologists to design education that optimizes students' brains in achieving the goals of Islamic Education. The existence of Islamic Education Neuroscience as a new scientific variety has the potential to carry out scientific development which can still be adapted from other Islamic Education scientific hybridization locations, such as Islamic Educational Anthropology and Islamic Educational Psychology, to fill the void that still has potential for Educational Neuroscience scholarship Islam finds its scientific development. The development of other scientific hybridizations that can be adapted in Islamic Education Neuroscience refers to Islamic Educational Anthropology and Islamic Educational Psychology by further developing and detailing scientific derivatives from Islamic Education Neuroscience, as well as designing learning that is more adaptive to students, such as the personality of each student.

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