

The Use of Neuroscience in the Design of Development of Arabic Learning Materials for *Santri*: A Case Study in *Pesantren* during the COVID-19 Period

Mohammad Jailani¹, Suyadi²

^{1,2}Departement Islamic of Education, Faculty of Islamic Studies, Ahmad Dahlan University, Indonesia.

Corresponding author

mohammad2007052014@webmail.uad.ac.id¹, suyadi@fai.uad.ac.id²

Abstract: This study aims to analyze neuroscience-based Arabic learning materials at the Babul Ulum pesantren. Researchers offer as an alternative to facilitate *santri* in learning Arabic, speed up memorization (*mufrodat*), and practice (*muhadasah*). So far, *santri* are still passive in learning Arabic, competently to direct *santri* to be able to master (*muhadasah*) and actively speak in the scope of memorization (*mufrodat*). The research approach used in this study is qualitative. The research subjects were ustadz and *santri*. Determination of research subjects is done by the purposive sampling technique. Data collection techniques were carried out using interview, observation, and documentation methods. The validity of this research data using triangulation. The results of the study found that neuroscience greatly contributed to the design of the development of Arabic learning materials, especially in the material (*mufrodat*), (*quwaidul lugeh al-arobiyyah*), and (*muhadasah*) on *santri* learning, especially during the COVID-19 pandemic. Neuroscience facilitates the development of Arabic material with highly strategic and practical reconstruction improvements. Neuroscience utilizes the functions of the right brain and left brain to grow intellectually, as well as optimize the cognitive, affective, and psychometric values of *santri*. In line with the evidence of the research findings, that *santri* in the online learning period find it difficult to master Arabic material. Thus, this research can integrate Arabic knowledge and has implications for the implementation of developing Arabic language material with understanding and happiness.

Keywords: Arabic, COVID-19, learning materials, neuroscience, *santri*.

Introduction

Arabic language teaching, in general, is very much needed both in formal and non-formal institutions, even in remote villages. The teaching of Arabic and its curriculum in the city is different from the development and implementation in the village. This happened because the development of Arabic language teaching in the city was more complete (Booth, 2021). Information and the development of science and information technology affect the rapid response to information received by teachers (Alfaizi, 2021). Including teaching Arabic in non-formal institutions or Islamic boarding schools (Rahman, 2021).

Speaking of teaching Arabic in Islamic boarding schools, the education and teaching system is still

in the conventional model or better known as (*Salafi*). This is because ustadz and kiyai are more interested in traditional or hereditary teaching carried out by the people, and the figures, closest people in the pesantren. talk about it, especially what is happening in an area of East Java, to be precise in the Pamekasan area of Madura. Cities and areas that are still known as Islamic boarding schools. a city that is still attached and thick with the culture of its Islamic boarding school.

In particular, the Babul Ulum Islamic Boarding School in Pasean Pamekasan still uses the direct pesantren learning method (*mubasaroh*). The ustadz put forward book learning techniques compared to modern-based learning methods and models. Although the local government of the Ministry of Religion in Pamekasan already has information

and applicable regulations. Ustadz continues to direct *santri* with pesantren-based teaching. for another reason, because the majority of *santri* who stay at the Babul Ulum Pamekasan Islamic boarding school come from the village. If it is seen from the structure of the *mading* curriculum of the pesantren curriculum at the Babul Ulum pesantren, and the archive of documents from the education management of the pesantren in which the knowledge management is not running well. Based on the researcher's preliminary study, some evidence of interview information was obtained, including, "So far, many *santri* have not been able to practice speaking Arabic, while some *santri* are already proficient in speaking Arabic fluently". Of the *santri* who can and who cannot read and practice, 70% are more *santri* who cannot read and practice Arabic.

The main problem in this study is the problems that have occurred explicitly so far, many *santri* have not responded well to learning Arabic. Just an example at the Babul Ulum Islamic Boarding School in Pamekasan. learning is still conventional or *salafiyah*, tactical systems, and *halaqah* systems, and memorization systems of interpreters and *shorof*.

So far, many studies on Arabic language learning from academics to Islamic boarding school practitioners have researched and analyzed the state of learning in Islamic boarding schools. both from research practitioners from campus, as well as practitioners from Islamic boarding schools or school dormitories. from the pesantren educator group, the activities carried out are comparative studies or further studies to get additional learning improvements in the boarding school itself (Huneety et al., 2020). Khuzanah 2021, describes in the results of her research that the problem factor that often occurs in Islamic boarding schools is how to teach and learn (Khuzanah and Septi, 2021). These two problems are focused on *ustadz* and *santri*. Teaching him is how the *ustadz* teaches in Islamic boarding schools. From learning how the *santri* study in Islamic boarding schools, it is clear that learning has not been adequate in teaching in Islamic boarding schools. Therefore, the researcher continues the novelty of Khuzanah's research which focuses on discussing the teaching of brain-

based Islamic boarding schools to *santri* (Khuzanah and Septi, 2021).

This study aims to analyze neuroscience-based Arabic learning materials at the Babul Ulum Islamic Boarding School. Researchers offer as an alternative to make it easier for *santri* to learn Arabic, speed up memorization (*mufrodah*), and practice (*muhadasah*). So far, *santris* are still passive in learning Arabic, competently to direct *santri* to be able to master (*muhadasah*) and actively speak in the scope of memorization (*mufrodah*) (Akmaliyah et al., 2021).

MATERIALS AND METHODS

Study area

At this time the data processing used to obtain data, namely, observing the field (Babul Ulum Islamic Boarding School Pasean Pamekasan), namely by carrying out direct observations to the Babul Ulum Islamic Boarding School Pasean Pamekasan. To find out firsthand what happened.

This type of research uses a qualitative approach. Qualitative research methods. The qualitative research method is a research method used to examine the condition of a natural object, (as opposed to an experiment) where the researcher is the key instrument. This study uses a naturalistic concept, namely, what is analyzed and the interpretation of the data used in this study is following the concepts of Miles and Huberman of data reduction, data presentation, and data interpretation (Sugiyono, 2017).



Figure 1. Descriptive Qualitative Method

This research was conducted at the Babul Ulum Islamic Boarding School, Pasean Pamekasan. The

subjects of this study consisted of *ustadz* and *santri*. Determination of the subject is done by using a purposive sampling technique. The goal is to get accurate and very valid information. Data collection techniques in this study are interviews, observation, and documentation. The discussion in this study has two aspects, namely curriculum, and learning methods. The steps in analyzing the data are, main, analyzing each Arabic language learning, learning method, and developing Arabic learning materials.

Result and Discussion

Based on the description that has been presented above, following the main discussion of research on the use of neuroscience in the development of neuroscience-based Arabic teaching materials, several research results can be found below:

Result

Geographical Location of Babul Ulum Islamic Boarding School

The location of the Babul Ulum Islamic Boarding School is located in the Box Pamekasan area of Madura, East Java Province. General description of Islamic boarding schools in Pamekasan city. Precisely in the village of Tlontoraja, Pasean sub-district, a Pantura village located along the north coast of Pamekasan. However, this village is also close to the mountains and has an abundance of tobacco and corn plants. One of the main livelihoods of the Pamekasan people is growing tobacco. The location is very strategic and the plants are also very fertile so this city is known as the city of tobacco. But on the other hand, the city of Pamekasan, Madura, is also known as a city of education which is more closely related to its pesantren culture.

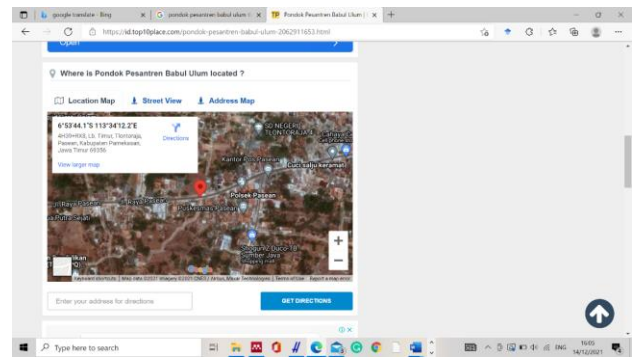


Figure 2. Geographical Location of Babul Ulum Islamic Boarding School

Figure 2. Above is the geographical and strategic location of the Babul Ulum Islamic boarding school. It is known that the majority of *santri* who study also live from the Pamekasan area, Madura. Although Pamekasan is known as the city of education, the community still considers boarding schools as the first consideration for education, before the younger generation and *santri* receive formal education at the high school level to college.

Implementation of Neuroscience-Based Arabic Learning

The form of curriculum and development of brain-based Arabic language material applied at the Babul Ulum Islamic Boarding School has a good quality overall from systematic delivery and presentation. Development of neuroscience-based Arabic language materials that are easy to use by *ustadz* to achieve Arabic learning goals, both *mufrodat* and *muhadasah* aspects, adjusting the way *santri* learn. As for the supporters of the *santri* in honing their language skills, the *santri* also practice and practice with their friends. Learning Arabic related to grammar (*nahwu-shorof*) can be combined with neurolinguistic concepts. The following are the results of neuroscience-based Arabic learning:

Table 1. Neuroscience-based learning outcomes

Indicator	Implication
Curriculum Aspect	In the aspect of the pesantren curriculum, Islamic boarding school-based Arabic learning with neuroscience-based post-graduate learning. Found some information data in this study, from the results of interviews and <i>santri</i> questionnaires. Santri more expects neuroscience-based learning, with a percentage compared to 80%. 20% of pesantren-based learning and 80% of neuroscience-based learning. The method used was before the neuroscience approach with the direct-based method of <i>santri</i> (<i>mubasaroh</i>). The difference is inactive <i>santri</i> in asking questions and practicing <i>muhadasah</i> .
Content Aspect	The development of neuroscience-based content makes it easier for <i>santri</i> to understand and analyze the questions given by the <i>ustadz</i> . On the one hand, the <i>santri</i> improvement process increased significantly, the reasons and assumptions that support the research are because the Pamekasan community, especially the <i>santri</i> , are more interested in interesting material and interesting media.
Learning outcomes	Experiments or experiments are known from research data, especially learning outcomes obtained by researchers. 15 <i>santri</i> can analyze <i>mufrodat</i> and <i>muhadasah</i> learning materials. As for the grammatical-based learning of the Arabic language in the <i>jurumiah santri</i> book, it is known to have significantly increased compared to the usual learning outcomes.

Discussion

Implications of Developing Neuroscience-Based Arabic Learning Materials

Al-Attas has a desire that Arabic language education can produce plenary *santri* (*insan kamil*) in Arabic (Vogel et al., 2015). Having sufficient insight and knowledge of the Arabic language among others (Hesty Maulida Eka Putry and Muassomah, 2020). Arabic language education implies that *santri* really can absorb and apply Arabic knowledge in their movements and steps of life (Abu-Remaileh, 2021). Especially in the daily life of *santri* can be realized by speaking Arabic. Al-Attas is of the view that Arabic is closely related to the language of the Qur'an, therefore Arabic is juxtaposed in terms of its teaching with the Qur'an. In the science of the Qur'an to gain fluency in pronouncing the verbal *makhirujul khuruf* must be softened by reciting the letters of the Qur'an repeatedly.

The role of the brain and speech here is indispensable in balancing the *lafadz* conveyed by word of mouth. The upper oral cavity and lower oral cavity interlock and touch to get the perfect letters (Noureen et al., 2017). The brain here is the center and direction of *santri* in conveying the sound of letters in Arabic. the sentence in I'rob or the form of the word *tasrif* must be following the sentence structure in Arabic. As for here, the role of

the brain remains as an influence and stimulus to the *santri* (Nashoih and Darmawan, 2019). The following is a description of the brain from a neuroscience perspective:

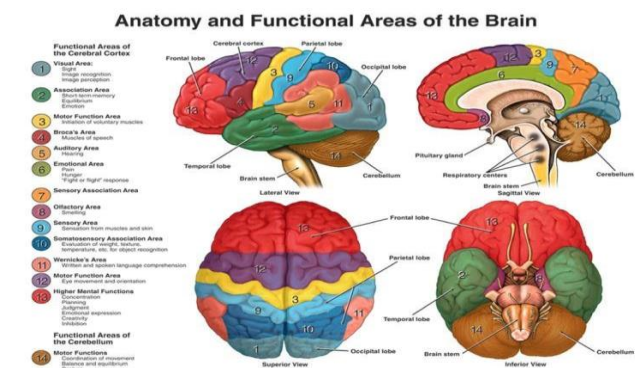


Figure 3. Neuroscience

Neuroscience education in learning is learning that is oriented and optimizes the potential of the *santri* brains (Nunung Nursyamsiah, Hikmah Maulani, 2021). Education based on neuroscience can be interpreted as education that does not have the potential to damage the *santris'* brains, they feel bored in participating in learning and memorizing *mufrodat* (Bonomo Ed. D, 2017).

Following Suyadi in Arabic language education for early childhood in the perspective of neuroscience. Arabic language education for early childhood is divided into three parts, namely

robotic, academic, and scientific (Suyadi, 2019). In the results, the three types of early childhood Arabic education are at risk of damaging the brain (Suyadi et al., 2020). In language education, *santri* can be interpreted as robots who are ordered or ordered (Pereira Soares et al., 2021). This robotic teacher more often orders the *santri* and manages the *santri*. Ustadz like this can be seen from the perspective of neuroscience, the *santri* brains become tense and do not develop.

The *santri* in robotic early childhood education are more silent and the *santri* will move if ordered by the *ustadz* (Hustad et al., 2021). The material given is more realistic, even utopian. Santri are forced to study material that is not needed by *santri* (Gangi et al., 2019). The Arabic language learning strategy in this education is very monotonous and the *santri* are theologically doctrinal, the *santri* are shown that this is a sin, it is a reward, it is not right, this is wrong, it means a chair, it means a cupboard, *hakadza abun, hakaza ummun, tilka ssabburuh, dzalika tobibah*, and *tilka ummi*. With this, the *santri* are not creative. As for the evaluation of Arabic learning given is labeling or labeling.

Meanwhile, mufrodat learning is developed, not guided and controlled. However, in neuroscience-based learning, the mufrodat material is directed at developing *santri* (Amrulloh et al., 2021). By way of the *santri* conveyed first five mufrodat, read over and over again and finally, the mufrodat was practiced with other friends (Rubbo et al., 2021). The essence of this learning is that *santri* are directed to practice both at school and home, by providing additional memorization at each material hour meeting (Alhojailan, 2021).

Arabic Grammatical Learning with Neurolinguistic Concepts

Every *santri* learns about anything that exists in this world, certainly cannot be separated from the use of the brain given by Allah SWT. Likewise, the language process experienced by every human being is a gift that is exaggerated by Him to glorify humans. Nothing is useless in this universe but themselves (Hilmi, 2017).

Nahwu-sorof learning requires the efforts of *santri* to function their brains to think and understand and reflect on His creation. The

language messages contained in the Qur'an allow humans to think and interpret the content according to their level of ability (Ferretti et al., 2020). This will make the situation different between people who interpret. Neurolinguistic rules say that the optimization of human language level is influenced by how strong the quality and quantity of human nerves are in transferring and processing the information obtained. If the information is considered to have no meaning in the life of the *santri*, then the information will not last long in the nerves (Hilmi, 2020).

The human brain consists of two halves of the brain, namely the right brain and left brain, even modern knowledge places the midbrain as the mediator and controller of the other two halves. The left brain is known as the language and mathematical brain, while the right brain is known as the art and color brain. These two hemispheres of the brain have different tendencies, therefore learning must pay attention to this (Di Luca et al., 2006).

In *nahwu-sorof* learning, the dominance of the use of the left hemisphere is good where most of the learning is by paying attention to the roles of language, namely reading and memorizing (Pesenti et al., 2021). However, the problem becomes different when what they have memorized from the interpretation has not been able to make learning able to master word changes in a text as well as when they want to write an article so that the dictionary becomes the main choice in producing a word.

Neurolinguistics is the study of the brain concerning language. In learning, it is inevitable to involve the brain in speech acts, because the tongue as a speech tool is a speech organ capable of producing language through brain optimization (Mohamed, 2008).

Conclusions

Based on the results of the discussion, this study found that neuroscience greatly contributed to the design of the development of Arabic learning materials, especially in the material (*mufrodat*), (*quwaidul lugeh al-arobiyyah*), and (*muhadasah*)

towards *santri* learning, especially during the COVID-19 pandemic. Neuroscience facilitates the development of Arabic language materials with highly strategic and practical reconstruction improvements. Neuroscience utilizes the functions of the right brain and left brain to grow intellectually, as well as optimize the cognitive, affective, and psychometric values of *santri*. In line with the research findings, that *santri* in the online learning period find it difficult to master Arabic material. Thus, this research can integrate Arabic knowledge and has implications for the implementation of developing Arabic language material with understanding and happiness. As for learning related to Arabic grammar (*nahwu-sorof*), it can be taken with the concept of neurolinguistics. with the criteria of *santri* learning outcomes, and the ability to read books (*nahwu-sorof*) increased significantly. The implications of neuroscience in the development of Arabic language material can help and facilitate *santri* in honing their mufrodat and muhadrasah skills. as well as this learning bonus, *santri* can improve our reading skills *nahwu-sorof*. recommendations of this research to *ustadz*, teachers, and academics to improve and continue this research in the aspect of teaching Arabic in Islamic boarding schools. As for very relevant lessons, they can be taken with brain-based learning and quantum learning.

Acknowledgements: We thank those who helped in this research. We express our gratitude to the big family of the leader of the Babul Ulum Islamic Boarding School Pasean Pamekasan, to the late K.H. Rahmatullah and their family. And those who represent *ya'ni kiyai* Abdul Muhni. We also thank the ICRE committee. The team of editors, reviewers, and editor-in-chief, especially the big family of the Tarbiyah faculty and the Rector of UIN Sunan Kalijaga Yogyakarta.

Conflict of Interest: This research has implications for learning Arabic in the present and the future. This research contribution offers an alternative brain-based Arabic learning, to make it easier for *santri* to learn Arabic material. and *santri* can hone their Arabic language skills.

References

- Abu-Remaileh, R. (2021). Country of words: Palestinian literature in the digital age of the refugee. *Journal of Arabic Literature*, 52(1-2), 68-96. <https://doi.org/10.1163/1570064x-12341420>.
- Akmaliyah, Hudzaifah, Y., Ulfah, N., & Pamungkas, M. I. (2021). Child-friendly teaching approach for arabic language in nn indonesian islamic boarding school. *International Journal of Language Education*, 5(1), 501-514. <https://doi.org/10.26858/IJOLE.V5I1.15297>.
- Alfaizi, A. K. (2021). Peluang dan Tantangan bagi Mahasiswa Bahasa dan Sastra Arab Menghadapi Dunia Kerja Efektivitas Metode Syawir dalam Upaya Peningkatan Skill Berbahasa Arab Menggunakan Media Kutub At-turast di Pondok Pesantren Masjid Agung Jami' Malang. *Seminar Nasional Bahasa Arab Mahasiswa V Tahun 2021 HMJ Sastra Arab Fakultas Sastra Universitas Negeri Malang*, 1, 1-23.
- Alhojailan, A. I. (2021). Developing an Understanding of The Sources of Some Graduate Students' Perceptions of Academic Writing. *Indonesian Journal of Applied Linguistics*, 11(2), 281-291. <https://doi.org/10.17509/ijal.v11i2.34265>.
- Amrulloh, M. A., Ikhwan, M., Islam, U., Raden, N., Lampung, I., Lampung, K. B., Islam, U., Sunan, N., & Yogyakarta, K. (2021). Stylistic of The Qur'an: Reading The Story of Sulaiman. *Arabiyat: Jurnal Pendidikan Bahasa Arab Dan Kebahasaaraban*, 8(1), 17-31.
- Bonomo Ed. D., V. (2017). Brain-Based Learning Theory. *Journal of Education and Human Development*, 6(2), 27-43. <https://doi.org/10.15640/jehd.v6n1a3>
- Booth, M. (2021). Zaynab fawwāz's feminist locutions. *Journal of Arabic Literature*, 52(1-2), 37-67. <https://doi.org/10.1163/1570064x-12341419>.
- Di Luca, S., Granà, A., Semenza, C., Seron, X., & Pesenti, M. (2006). Finger-digit compatibility in Arabic numeral processing. *Quarterly Journal of Experimental Psychology*, 59(9), 1648-1663. <https://doi.org/10.1080/17470210500256839>.
- Ferretti, T. R., Katz, A. N., Schwint, C. A., Patterson, C., & Pradzynski, D. (2020). How discourse constraints influence neurolinguistic mechanisms during the comprehension of proverbs. *Cognitive, Affective and Behavioral Neuroscience*, 20(3), 604-623. <https://doi.org/10.3758/s13415-020-00790-9>
- Gangi, F., Mustilli, M., & Varrone, N. (2019). The impact of corporate social responsibility (CSR) knowledge on corporate financial performance: evidence from the European banking industry. *Journal of Knowledge Management*, 23(1), 110-134. <https://doi.org/10.1108/JKM-04-2018-0267>.
- Hesty Maulida Eka Putry, & Muassomah. (2020). Tiktok Application as a Project-Based Arabic Learning Media.

- Angewandte Chemie International Edition*, 6(11), 951–952., 7(2), 139–154.
- Hilmi, D. (2017). Sistem Pembelajaran Al-Qawa'id Al-Sharfiyah di Indonesia Dalam Perspektif Neurolinguistik. *Tarbiyatuna*, 2(1), 140–168.
- Hilmi, D. (2020). Impact of Arabic Online Learning in The Perspective of How The Brain Learns. *Ijaz Arabi Journal of Arabic Learning*, 4(1), 59–73. <https://doi.org/10.18860/ijazarabi.v4i1.10442>.
- Huneety, A., Mashaqba, B., Al-Quran, M., & Hishma, J. (2020). Stress production by Cebuano learners of Arabic: A metrical analysis. *Indonesian Journal of Applied Linguistics*, 9(3), 517–525. <https://doi.org/10.17509/ijal.v9i3.23201>
- Hustad, K. C., Mahr, T. J., Natzke, P., & Rathouz, P. J. (2021). Speech development between 30 and 119 months in typical children i: Intelligibility growth curves for single-word and multiword productions. *Journal of Speech, Language, and Hearing Research*, 64(10), 3707–3719. https://doi.org/10.1044/2021_JSLHR-21-00142
- Khuzanah, & Septi, D. (2021). Comparison of Arabic Learning At Al-Mizan Muhammadiyah Islamic Boarding School With Sunan Drajat Nahdzotul Ulama 'Islamic Boarding School in Lamongan. *Web of Scientist: International Scientific Research Journal*, 4(1), 6.
- Mohamed, W. M. Y. (2008). Arab and Muslim contributions to modern neuroscience. *IBRO History of Neuroscience*, 169(3), 255.
- Nashoih, A. K., & Darmawan, M. F. (2019). Pengembangan Bahan Ajar Nahwu Berbasis Kontrastif Untuk Mengatasi Interferensi Bahasa Indonesia Terhadap Bahasa Arab. *Arabiyatuna: Jurnal Bahasa Arab*, 3(2), 335. <https://doi.org/10.29240/jba.v3i2.1008>.
- Noureen, G., Awan, R. N., & Fatima, H. (2017). Effect of Brain-Based learning on achievement of VII graders in Mathematics. *Journal of Elementary Education*, 27(2), 85–97.
- Nunung Nursyamsiah, Hikmah Maulani, and S. M. K. (2021). Stylistics of Nida Ilahi and Its Implications in Character Learning. *Jurnal Al Bayan: Jurnal Jurusan Pendidikan Bahasa Arab*, 13(2), 353–368. <https://doi.org/10.24042/albayan.v>.
- Pereira Soares, S. M., Kubota, M., Rossi, E., & Rothman, J. (2021). Determinants of bilingualism predict dynamic changes in resting state EEG oscillations. *Brain and Language*, 223(October), 105030. <https://doi.org/10.1016/j.bandl.2021.105030>.
- Pesenti, M., Thioux, M., Seron, X., & Volder, A. De. (2021). Neuroanatomical substrates of Arabic number processing, numerical comparison and simple addition: A PET study. *Journal of Cognitive Neuroscience*, 12(4), 461–479. [https://doi.org/10.1016/s1053-8119\(18\)31064-4](https://doi.org/10.1016/s1053-8119(18)31064-4)
- Rahman, A. (2021). Peran Lingkungan Bahasa Arab Dalam Meningkatkan Penguasaan Bahasa Arab Pada Pesantren Izzur Risalah Panyabungan. *Prosiding Konferensi Nasional I Hasil Pengabdian Masyarakat*, 1(1), 83–92.
- Rubbo, P., Picinin, C. T., & Pilatti, L. A. (2021). Innovation and economic complexity in BRICS. *International Journal of Knowledge Management Studies*, 12(1), 66–79. <https://doi.org/10.1504/IJKMS.2021.112222>
- Sugiyono. (2017). *Metode Penelitian Kuantitatif Kualitatif dan R&D* (1st ed.). Alfabeta.
- Suyadi. (2019). Hybridization of Islamic Education and Neuroscience: Transdisciplinary Studies of 'Aql in the Quran and the Brain in Neuroscience. *Dinamika Ilmu*, 19(2), 237–249. <https://doi.org/10.21093/di.v19i2.1601>
- Suyadi, Nuryana, Z., & Fauzi, N. A. F. (2020). The fiqh of disaster: The mitigation of Covid-19 in the perspective of Islamic education-neuroscience. *International Journal of Disaster Risk Reduction*, 51(2), 1–15. <https://doi.org/doi.org/10/1016/J.ijdr.2020.101848>.
- Vogel, S. E., Goffin, C., & Ansari, D. (2015). Developmental specialization of the left parietal cortex for the semantic representation of Arabic numerals: An fMR-adaptation study. *Developmental Cognitive Neuroscience*, 12(1), 61–73. <https://doi.org/10.1016/j.dcn.2014.12.001>.