

PHENOMENOLOGY STUDIES: COLLEGE STUDENT EXPERIENCE IN EARLY CHILDHOOD LEARNING BASED ON NEUROSCIENCE STUDIES

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Abstract: Neuroscience in learning is a study that studies the brain in terms of anatomy and physiology and its correlation with learning. This study analyzed the ability of research subjects to link learning in early childhood with neuroscience studies. This study uses a qualitative method with a phenomenological approach. The research subjects were PIAUD IAIN Ponorogo students taking Neuroscience courses in the 2022/2023 academic year. The learning methods for early childhood analyzed in this study included drum bands, drama, movements and songs, singing, modern and traditional dance, games, and stories or fairy tales presented in work performances. Data collection was carried out through documentation and interviews. The research data were analyzed using the Miles and Huberman Analysis model, which consisted of three steps: reduction, data presentation, and drawing conclusions. Results Analysis of the research data showed that the research subjects could link learning in early childhood with neuroscience studies and knew the importance of learning in early childhood based on neuroscience studies.

Keywords: Neuroscience; Early childhood learning; Brain Anatomy and Physiology;

Abstrak: Neurosains dalam pembelajaran merupakan suatu ilmu yang mempelajari otak ditinjau dari anatomi dan fisiologi serta korelasinya dengan pembelajaran. Penelitian ini menganalisis kemampuan subjek penelitian dalam menghubungkan pembelajaran pada anak usia dini dengan kajian neurosains. Penelitian ini menggunakan metode kualitatif dengan pendekatan fenomenologis. Subyek penelitian adalah mahasiswa PIAUD IAIN Ponorogo yang mengambil mata kuliah Neurosains tahun ajaran 2022/2023. Metode pembelajaran anak usia dini yang dianalisis dalam penelitian ini meliputi drum band, drama, gerak dan lagu, nyanyian, tari modern dan tradisional, permainan, serta cerita atau dongeng yang disajikan dalam pertunjukan karya. Pengumpulan data dilakukan melalui dokumentasi dan wawancara. Data penelitian dianalisis menggunakan model Analisis Miles dan Huberman yang terdiri dari tiga tahap yaitu reduksi, penyajian data, dan penarikan kesimpulan. Hasil Analisis data penelitian menunjukkan bahwa subjek penelitian dapat menghubungkan pembelajaran pada anak usia dini dengan kajian neurosains dan mengetahui pentingnya pembelajaran pada anak usia dini berdasarkan kajian neurosains.

Kata Kunci: Neurosains; Pembelajaran anak usia dini; Anatomi dan Fisiologi Otak;

INTRODUCTION

Neuroscience is a field of science that studies the anatomy and physiology of the brain, as well as brain function¹. Neuroscience also studies neurons or nerve cells². Anatomically, the main parts of the brain are the brainstem, thalamus, cerebellum, cerebrum, and limbic system³. The brain stem is responsible for automatic movement functions such as balance, heartbeat and breathing, and so on⁴. The cerebellum coordinates voluntary movement, balance, memory, emotion regulation and time regulation⁵. The cerebrum is the center of thought processes in humans and the center of conscious activities. The limbic system functions related to emotion, aggression, the urge to eat⁶.

Early childhood learning with neuroscience begins with the teacher understanding what will be done and knowing the performance of the human brain. The learning process with various methods will activate the brain. It is important for teachers to know this, so that all the potential of the brain in early childhood students can develop properly and in balance⁷.

Prospective PAUD teachers need to learn and be able to apply neuroscience in learning to help them later achieve learning goals for their students⁸. The application of neuroscience in learning is to pay attention to the development and function of the brain, so that learning can facilitate and provide stimulation for brain development. Neuroscience emphasizes the performance of the brain, namely how the process of thinking occurs that produces knowledge,

¹ Salamah Eka Susanti, "Pembelajaran Anak Usia Dini Dalam Kajian Neurosains" 2, no. April (2021): 53–60.

² Erica A. Wehrwein, Hakan S. Orer, and Susan M. Barman, "Overview of the Anatomy, Physiology, and Pharmacology of the Autonomic Nervous System," *Comprehensive Physiology* 6, no. 3 (2016): 1239–78, <https://doi.org/10.1002/CPHY.C150037>.

³ Wehrwein, Orer, and Barman.

⁴ Larry W Swanson, "What Is the Brain?," *Trends in Neurosciences* 23, no. 11 (2000): 519–27.

⁵ Rajani Singh, "Cerebellum: Its Anatomy, Functions and Diseases," in *Neurodegenerative Diseases-Molecular Mechanisms and Current Therapeutic Approaches* (IntechOpen, 2020).

⁶ Albert L Rhoton, "The Cerebrum. Anatomy," *Neurosurgery* 61, no. 1 Suppl (2007): 37–39, <https://doi.org/10.1227/01.neu.0000255490.88321.ce>.

⁷ Stephen Rushton, "Neuroscience, Early Childhood Education and Play: We Are Doing It Right!," *Early Childhood Education Journal* 39, no. 2 (2011): 89–94, <https://doi.org/10.1007/s10643-011-0447-z>.

⁸ Susanti, "Pembelajaran Anak Usia Dini Dalam Kajian Neurosains."

attitudes, behavior, and actions. Learning for early childhood based on neuroscience must also adjust to the stages of child brain development, where the brain naturally has the ability to learn⁹.

Newborn children to early childhood experience a golden window in their brains. Newborns have 100-200 billion neurons, and the various abilities of the brain are most developed in early childhood. Furthermore, brain development will continue until the age of 18 years, this development is not as fast as the development of children under 5 years of age. Changes that occur in the early years are vital because they will form the foundation for development in the following years. The process of development at a more advanced level will go well if the basic development of the brain in children is well developed. The brain also has the ability of neuroplasticity which can change and adapt according to the experience given to the individual. One of these neuroplasticities is that experience or memory will change the structure of the brain. Stimulation of the child's brain will affect the development of the child's brain¹⁰.

Methods in early childhood learning are very diverse, including playing music, drum bands, singing, role playing, dancing, movement and songs, and so on. One method that is important in stimulating brain development in children is music. Music can improve social skills, increase empathy, increase sensitivity to nature, and be able to provide memories of what they learn¹¹. Learning with role playing or drama methods will increase children's imagination. The child plays the character from the story, so that the child's imagination plays a role in playing another figure in that role¹². Dancing and music link different parts of the brain,

⁹ Amirul Wathon, "Neurosains Dalam Pendidikan," *LENTERA, Kajian Keagamaan, Keilmuan Dan Teknologi*, 2006, 136–45.

¹⁰ S Suyadi and Nita Nur, "Teori Pembelajaran Anak Usia Dini Dalam Kajian Neurosains," *PT. Remaja Rosda Karya*, 2017.

¹¹ Citra Trisna Dewi, Nur Wulandari Fitri, and Ovi Soviya, "Neurosains Dalam Pembelajaran Agama Islam," *Ta'allum: Jurnal Pendidikan Islam* 6, no. 2 (2018): 259–80, <https://doi.org/10.21274/taalum.2018.6.2.259-280>.

¹² Suyadi and Nur, "Teori Pembelajaran Anak Usia Dini Dalam Kajian Neurosains."

such as those involved in perception, action, and emotion¹³. Activities associated with the physical activate cognition and sensory¹⁴.

Learning with various neuroscience-based early childhood learning methods can provide a fun learning experience for students, just like using a project in the form of an appearance in a work performance. The performance of the work is project-based learning. where students develop neuroscience-based learning.

RESEARCH METHOD

This research is a qualitative research where qualitative research understands human behavior from the researcher's point of view.¹⁵. The research approach uses phenomenological research where the researcher tries to understand and describe the experiences experienced by the research subject.¹⁶. The subjects of this study were students of Early Childhood Islamic Education at IAIN Ponorogo who were taking Neuroscience courses in the 2022/2023 Academic Year. Data collection was carried out on the preparations, processes, and reports on the activities of performing works in the Neuroscience course. The purpose of this study was to analyze the ability of the research subjects to relate learning in early childhood to Neuroscience.

Data were analyzed using the Miles and Huberman analysis model which consisted of reduction steps, data presentation, and drawing conclusions. The researcher asked the research subject to reflect on his experience in performing the work. The researcher also asked the research subject to explain neuroscience studies that could be taken in early childhood learning that was exhibited in the performance of works.

¹³ Olivia Foster Vander Elst et al., "The Neuroscience of Dance: A Conceptual Framework and Systematic Review," *Neuroscience and Biobehavioral Reviews* 150, no. July 2022 (2023): 105197, <https://doi.org/10.1016/j.neubiorev.2023.105197>.

¹⁴ Sowmya Kshtriya et al., "Dance and Aging: A Critical Review of Findings in Neuroscience," *American Journal of Dance Therapy* 37, no. 2 (2015): 81–112, <https://doi.org/10.1007/s10465-015-9196-7>.

¹⁵ Betina Hollstein, "Qualitative Approaches," *The SAGE Handbook of Social Network Analysis*, 2011, 404–16.

¹⁶ Michelle M Byrne, "Understanding Life Experiences through a Phenomenological Approach to Research," *AORN Journal* 73, no. 4 (2001): 830.

RESULT AND DISCUSSION

The performances of works regarding early childhood learning methods that will be discussed in this study are drum bands, dramas, movements and songs, singing, modern and traditional dance, games, and telling stories presented in work performances. The performance of this work is project-based learning which is given to students. Student involvement and activeness in being creative during the learning process, producing creative work and exploring student abilities so that active and collaborative learning is formed. In this development, students need to have the character and skills to think, behave and act.

Students' ability to link learning for early childhood with neuroscience

The ability to link neuroscience with learning for early childhood is very important for students in increasing their understanding of learning. The implementation of a work performance project in a neuroscience course causes students to feel difficult and confused, because students have to look for connectivity of activities with neuroscience based on sources. Searching for reference sources requires more effort for students.

The performance of works is an activity in which students display their work based on neuroscience studies. Students are expected to be able to have provisions in understanding theory and practice. The ability of students' understanding in carrying out work performance activities by linking it with neuroscience will influence the activities of these activities. Students will find it difficult to explain the relationship between neuroscience and the learning activities displayed in the performance, so an in-depth study is needed to look for this correlation. The result of the work performance activity is that students can link in detail the practical activities of early childhood learning with neuroscience studies. This makes students more critical and think long-term about the effects of carrying out early childhood learning activities. Students' knowledge of neuroscience in learning for early childhood through work performance activities is considered quite effective. Students realize that knowledge of Neuroscience is

needed when delivering learning to early childhood.

Student knowledge regarding the relationship between early childhood learning methods and Neuroscience

a. Drumband

The results of observation and documentation of students who perform works based on neuroscience show that students are able to relate drumband to neuroscience well. Based on the studies conducted, students can relate that drumband is able to stimulate a child's brain to imagine, convey creative ideas, train self-confidence in children and be able to communicate and cooperate with others.

b. Fairy tales or stories

The results of observations and documentation of students who perform works based on neuroscience show that students are able to link fairy tales or stories with neuroscience well. Students conduct a study whose result is a method of telling stories for children that can develop language skills in children. Repeating stories heard by children using simplified language affects the richness of the basic vocabulary of children.

c. Traditional dance and modern dance

Students are able to link traditional dance and modern dance with neuroscience. Students stated that in the context of neuroscience traditional dance movements can be learned through the study of visual perception, pattern recognition, social interaction and integration of children's motor sensors. Dance stimulates areas related to movement, rhythm and expression. Complex dance movements require good coordination between sight, hearing and motor skills.

d. Traditional games

Students are able to link traditional games with neuroscience. Students presented traditional games of cublak cublak suweng, folding origami paper,

making paper airplanes and flying them, cranks, and dragon snakes. Students can examine that teachers can encourage children to be able to learn while playing, because playing is fun and is an activity that children like. Games can activate many areas of the brain's cortex.

e. Singing

Based on the results of observations and documentation, students are able to link singing activities with neuroscience. Singing by imitating the teacher with their friends makes children enthusiastic and likes learning activities at school. Singing for children is the language of emotion, the language of tone and movement.

f. Musical drama

Students are able to link neuroscience with musical drama activities. The link between learning musical drama and neuroscience is to stimulate the child's nervous system optimally. Playing drama can train children to recognize and manage emotions, train them to be responsible, develop children in self-motivation and recognize the emotions of others.

g. Song and motion

Students are able to relate neuroscience to learning songs and motion. Movement and song learning is singing and moving to the rhythm. Music can activate more complex parts of the brain. Song movements also develop basic motor skills, language, sensitivity to music rhythms, self-confidence and the courage to take risks.

Discussion

Factors Influencing Students in Relating Early Childhood Learning to Neuroscience

Based on the results of research data analysis, there are several factors that influence students' ability to link early childhood learning with neuroscience, both factors that come from within the student and factors from outside the student. Based on interviews with research subjects, in linking AUD learning with neuroscience there are factors of self-motivation, concentration, and

understanding of neuroscience material. Student understanding is a key factor that will make it easier for students to relate neuroscience to learning. Students need to know and understand the subject matter in neuroscience courses. Understanding of neuroscience material will make it easier for students to relate the learning that is displayed. Understanding includes students' ability to understand and capture neuroscience studies that have been obtained during lectures. Linking learning performance with neuroscience is strongly influenced by students' understanding.¹⁷ During lectures, the process of preparation, appearance, and reporting requires concentration in the process. Concentration during the activity will make it easier for students to grasp the material and relate the AUD learning presented to neuroscience.

Motivation and self-confidence are also important factors. Self-confidence will make students have good motivation in carrying out the learning methods displayed. Confidence will also make it easier for students to give opinions and convey the results of their thoughts. If students do not have self-confidence, they will find it difficult to relate neuroscience studies to appearance. Motivation is important for students to form perceptions about themselves¹⁸.

CONCLUSION

The experience of students in trying early childhood learning in neuroscience studies is generally going well. Students are able to link learning models with neuroscience studies. Internal factors that affect students' ability to link early childhood learning with neuroscience studies include motivation, concentration, understanding, and self-confidence.

REFERENCES

Byrne, Michelle M. "Understanding Life Experiences through a

¹⁷ Ibrahim El-Sayed Ebaid, "Sustainability and Accounting Education: Perspectives of Undergraduate Accounting Students in Saudi Arabia," *Journal of Applied Research in Higher Education* 14, no. 4 (2022): 1371–93.

¹⁸ Jodi Holschuh Hynd Sherrie Nist, Cynthia, "LEARNING COMPLEX SCIENTIFIC INFORMATION: MOTIVATION THEORY AND ITS RELATION TO STUDENT PERCEPTIONS," *Reading & Writing Quarterly* 16, no. 1 (January 1, 2000): 23–57, <https://doi.org/10.1080/105735600278051>.

- Phenomenological Approach to Research." *AORN Journal* 73, no. 4 (2001): 830.
- Dewi, Citra Trisna, Nur Wulandari Fitri, and Ovi Soviya. "Neurosains Dalam Pembelajaran Agama Islam." *Ta'allum: Jurnal Pendidikan Islam* 6, no. 2 (2018): 259–80. <https://doi.org/10.21274/taalum.2018.6.2.259-280>.
- Ebaid, Ibrahim El-Sayed. "Sustainability and Accounting Education: Perspectives of Undergraduate Accounting Students in Saudi Arabia." *Journal of Applied Research in Higher Education* 14, no. 4 (2022): 1371–93.
- Foster Vander Elst, Olivia, Nicholas H.D. Foster, Peter Vuust, Peter E. Keller, and Morten L. Kringelbach. "The Neuroscience of Dance: A Conceptual Framework and Systematic Review." *Neuroscience and Biobehavioral Reviews* 150, no. July 2022 (2023): 105197. <https://doi.org/10.1016/j.neubiorev.2023.105197>.
- Hollstein, Betina. "Qualitative Approaches." *The SAGE Handbook of Social Network Analysis*, 2011, 404–16.
- Hynd Sherrie Nist, Cynthia, Jodi Holschuh. "LEARNING COMPLEX SCIENTIFIC INFORMATION: MOTIVATION THEORY AND ITS RELATION TO STUDENT PERCEPTIONS." *Reading & Writing Quarterly* 16, no. 1 (January 1, 2000): 23–57. <https://doi.org/10.1080/105735600278051>.
- Kshtriya, Sowmya, Rebecca Barnstaple, Débora B Rabinovich, and Joseph F X DeSouza. "Dance and Aging: A Critical Review of Findings in Neuroscience." *American Journal of Dance Therapy* 37, no. 2 (2015): 81–112. <https://doi.org/10.1007/s10465-015-9196-7>.
- Rhoton, Albert L. "The Cerebrum. Anatomy." *Neurosurgery* 61, no. 1 Suppl (2007): 37–39. <https://doi.org/10.1227/01.neu.0000255490.88321.ce>.
- Rushton, Stephen. "Neuroscience, Early Childhood Education and Play: We Are Doing It Right!" *Early Childhood Education Journal* 39, no. 2 (2011): 89–94. <https://doi.org/10.1007/s10643-011-0447-z>.
- Singh, Rajani. "Cerebellum: Its Anatomy, Functions and Diseases." In

Ulinnuha Nur Faizah, dkk. *Phenomenology Studies: College Student Experience In Early Childhood Learning Based On Neuroscience Studies*

Neurodegenerative Diseases-Molecular Mechanisms and Current Therapeutic Approaches. IntechOpen, 2020.

Susanti, Salamah Eka. "Pembelajaran Anak Usia Dini Dalam Kajian Neurosains" 2, no. April (2021): 53–60.

Suyadi, S, and Nita Nur. "Teori Pembelajaran Anak Usia Dini Dalam Kajian Neurosains." *PT. Remaja Rosda Karya*, 2017.

Swanson, Larry W. "What Is the Brain?" *Trends in Neurosciences* 23, no. 11 (2000): 519–27.

Wathon, Amirul. "Neurosains Dalam Pendidikan." *LENTERA, Kajian Keagamaan, Keilmuwan Dan Teknologi*, 2006, 136–45.

Wehrwein, Erica A., Hakan S. Orer, and Susan M. Barman. "Overview of the Anatomy, Physiology, and Pharmacology of the Autonomic Nervous System." *Comprehensive Physiology* 6, no. 3 (2016): 1239–78.
<https://doi.org/10.1002/CPHY.C150037>.