Neuropedagogical Foundations for Moral Development in Early Childhood Education

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Abstract: Early childhood is a crucial period in the formation of moral identity, the regulation of emotions, and ethical decision-making. Moral education that is traditional and focuses on behavioral habituation is often not able to accommodate the needs of children's brain development optimally. Neuropedagogy as an interdisciplinary approach that combines neuroscience, psychology, and pedagogy, offers a more comprehensive way of supporting early childhood moral development. This article examines how the foundational principles of neuropedagogy such as emotional safety, multisensory engagement, social interaction, and reflective learning can be the foundation for instilling core moral values such as empathy, responsibility, and honesty. Based on the results of a review of the literature and international practice, these findings encourage a paradigm shift in education towards a learning environment that is in harmony with the development of the child's brain and emotional needs.

Keywords: neuropedagogy, moral development, early childhood, early childhood education

INTRODUCTION

Morality is the quality of human actions or behaviors that are related to wrong or right, good or bad, which he believes to be normative rules or rules and applies in a certain community of society that is carried out because of a necessity (Semiawan & Yufiarti, 2005).

The moral crisis experienced by Indonesia today is an effect of globalization, even so, we must not scapegoat globalization. The effects of globalization itself do not always have an impact, it all depends on ourselves how to respond and bring globalization to a positive thing. The influence of foreign cultures that enter through social media (internet) also plays a big role in the moral decline in Indonesia (Budiarto, 2020). Globalization requires a generation that can compete in the international world, while having a strong character (Ariani, 2019). The fact is that children are now familiar with changes in the digital era, especially with the use of the internet.

In the literature study, moral problems were found Some moral problems at the level of early childhood education, for example The moral behavior of Pertiwi Kindergarten in Sungai Pakning Village, Bengkalis Regency is such as: 1) children can't wait for their turn, 2) children speak rudely or speak disrespectfully, 3) children like to pick friends, 4) children mock their friends, 5) children fight with each other, 6) children like to damage plants and litter carelessly (Yunika et al., 2019). Early childhood is in the form of anti-social behavior, including threatening, whining, and temper tantrums (Rahayu, 2017). 300 mothers in Greece who have an early childhood say that their children have aggressive traits (Kakavoulis, 1998). The moral behavior of Semarang kindergarten children disturb learning like children often fight, disturb friends, disrespectful to teachers and difficult to advise (Bain, 2010)

School is not only a place to develop academically but to prepare children as moral agents (Walker et al., 2012). Moral development is supported by teachers and schools in preschool (Johansson et al., 2011). School assignments to improve students' social-emotional competence, character, health and civic engagement (Greenberg et al., 2003). Teachers have a role to provide moral control and involve children in moral education (Buzzelli, 2018). Moral behaviors of justice, cooperation, and care, are also influenced by children's relationships with peers and adults (Sedeño & Rovira, 2023). Personality formation takes place gradually and develops so that it is a process towards perfection (Ulya, 2020).

Based on the findings of the research to be followed up from previous research, it is stated that it is necessary to develop a learning model to frame fun moral learning practices (Narvaez, 2020). The importance of a moral learning process that emphasizes thinking so that it is formed *Human Action* and *Social Action* (Carniel et al., 2024). Teachers in schools need effective ways of teaching morals to develop morals in children (Midgette et al., 2018). Moral

learning with a multimedia system, namely robots, can be used for moral and intellectual education in early childhood (Yamamoto et al., 2006). For schools, it is necessary to develop learning that takes into account the characteristics and experiences of children (Chan, 2020). Primary schools need to develop learning to develop the potential of the brain in terms of knowledge, skills and attitudes (Nurasiah et al., 2022).

Moral development in early childhood is an important foundation for the formation of character, values, and ethical behavior throughout life. At an early age, children begin to understand social norms, empathy, justice, and responsibility (Lickona, 2019; Narvaez, 2020; Nucci, 2001). According to Piaget (1965) and Kohlberg (1981), the ability to reason morally develops through active interaction with the environment and through challenging cognitive processes. Therefore, children need a structured yet emotionally responsive environment in order to be able to

Moral education in early childhood is often approached in a simple and behaviorally oriented way, for example with an emphasis on rule compliance or punishment for offenses, without understanding the underlying cognitive and affective mechanisms (Berkowitz & Bier, 2004). This approach is instructional and repetitive, and does not encourage internal reflection. On the other hand, many early childhood educators have not received adequate training on how brain development affects moral behavior, so opportunities to foster empathy, self-regulation, and reflective decision-making are underutilized (Immordino-Yang & Damasio, 2007).

Neuropedagogy-based moral development is important because this approach combines an understanding of how the brain works with educational strategies that are able to shape children's behavior and ethical values more naturally and deeply. Early childhood is a critical period in brain development, especially in the part of the prefrontal cortex that plays a role in self-regulation, empathy, and moral decision-making. At the same time, children begin to build a foundation of social values and behaviors through repetitive emotional interactions and experiences. The neuropedagogical approach is able to bridge this biological development with appropriate educational interventions, such as the use of emotion-based learning, warm relationships with teachers, and the habituation of social reflection to build a complete moral understanding.

Some practices of using neuropedagogy In Hungary in kindergarten education, teachers there have the awareness to carry out learning with a neuropedagogical approach,

namely learning by considering brain and emotional development in maximizing child development. They build experiences through activities with the support of an environment full of love, care, emotional support, and empathy during the learning process Neuropedagogy (Szécsi et al., 2018). Neuropedagogical and psychological approaches can develop creative abilities in drawing classes to improve the personality of preschoolers in Ukraine. The neuropedagogical competence of an art teacher has built the correlation ability of the creative cognition nerve in adjusting creative tasks according to the age, ability and psychology of the students. A child's positive mood is achieved by stimulating the child's emotions (Shulha et al., 2021).

This article aims to explain the implications of neuropedagogy in moral learning in early childhood.

METHOD

This research method uses a library research approach, by tracing various relevant scientific sources. The search process was carried out through the use of keywords such as "neuropedagogy", "moral", and "early childhood" in national and international scientific journal databases, as well as references from credible academic books. The data collection technique is carried out through the documentation method, namely by collecting, recording, and reviewing written documents such as journal articles, books, and previous research results that are in accordance with the study topic.

Furthermore, the data that has been collected is analyzed using critical analysis techniques, which aim to examine in depth the relevance, accuracy, and contribution of each source to the development of the main ideas in the research. This analysis allowed researchers to build a strong theoretical synthesis and generate profound conceptual findings regarding the role of neuropedagogy in fostering morality in early childhood.

RESULT AND DICSUSSION

Neuropedagogy

Neuropedagogy considers brain activity. Therefore, from the design of formal and non-formal learning activities, cognitive activities must be stimulated. Brain stimulation must be appropriate in learning. When the human brain needs to solve, neuropedagogy forms educational tasks to solve problems. One of the important principles of neuropedagogy for educational activities is the production of dopamine. Dopamine is a

substance in the brain that causes satisfaction with the results of human activities. This approach combines emotional satisfaction and intellectual problem-solving(Kaplınskıy et al., 2022)

The meaning of nauropedagogy based on his findings, *first* according to Jiménez (2010) reveals that for neuropedagogy, the object of study is human life, and in particular the brain, which is understood not as a computer, but as a social organ that requires hugs, recreation, and play for its development. *Second* according to Castillo (2015) neuropedagogy emerged from a combination of pedagogy, psychology, and neuroscience; In an effort to study the brain and its functions, approach the human being integrally from the social dimension, recognize its needs and characteristics to empower it and develop various aspects, including learning. Neuropedagogy, refers to how the brain works, and how understanding the brain can be used to explain whether or not a child's learning practices are preferred. *Last*, according to Torres Ríos, Alvarado Zermeño, and Bernal Trigueros (2018) argue that neuropedagogy allows teachers to improve the learning of their students. In this case, teachers need to have knowledge of this discipline to design didactic strategies that allow students to form competencies contained in the career curriculum (Fernández, 2022).

Neuropedagogists aim to create improved learning through educators' initiatives to use discoveries about learning, memory, language, and other areas in students' cognitive structures, so that educators can create the best strategies for teaching and learning. The tasks of neuropedagogy include: collecting information about the neurobiological reality of education; analysis of reality, relationships and interdependencies in it; disseminate the knowledge gained for the purpose of transforming such reality(Thomas et al., 2019). The neuropedagogical approach helps to modernize the education system to improve the teaching and education process and address school failures(Piddubna et al., 2023).

According to standards and research findings on the brain, learning needs to pay attention to brain-based strategies to optimize learning for all children:

1) Safe Environment

Safety and well-being are priorities in organizing brain-based learning. Children will have learning difficulties if the child experiences fear, restrictions,

hunger, aggressive peer behavior. Therefore, teachers ensure that the classroom is free of scary things, start activities with safety rituals, and assure children that they are safe with teachers and classmates. Consider the learning environment.

Farmer-Dougan and Alferink in their research mentioned that the quality of parenting has an impact on the development of the brain, structures and neural networks. Therefore, it is important to create a supportive environment during the eight years of children's development. If the environment is limited then the activities and experiences produced are limited then the neural network will inhibit exploration and learning (Valeri Farmer-Dougan & Larry A. Alferink, 2013)

2) Emotion

Emotions are an effective tool for influencing memory and brain function. When a person feels satisfied, the brain will release endorphins that are able to improve memory skills (Jensen, 2008). Therefore, it is necessary to start the class with *first* With humorous and funny stories because laughter makes children feel safe and satisfied. *Second* Sing songs together or move and songs, even draw freely while singing fun music. *Third* pay attention to the order and speed of daily activities. Children will feel overwhelmed if they receive too much new information, so the teacher invites the child to reflect on what they have learned. *Fourth* Help the child to control what he learns. The researchers agree that making learning short and topical is more in line with the brain's processing abilities.

Fifth Be proactive, using logical strategies to respond to situations in the classroom because threats and punishments can cause negative emotions and hinder learning. *Sixth*, maintain social and emotional intelligence. Children must learn to follow the teacher's direction, work together, do assignments, complete assignments, and take the initiative to master new information, control verbal impulses, behavior, solve problems, and take responsibility for their actions. This is the right time to create a cooperative, collaborative, and teamwork learning situation.

3) Multisensory Practice

The more senses involved during learning, the more the brain will receive information. By using various senses to learn, children will find it easier to do,

matching new information with the knowledge they have. The first activity that can be done , the original material is the use of familiar and real objects that show concepts that can make ideas concrete. *Second,* using songs or rhymes, rhythmic patterns are inherent in children. *Third,* make things always fun. Sing, dance, play games and laugh. It is an activity that uses many senses and at the same time improves memory. *Fourth,* provide a natural environment. Bring children's activities into the real environment.

4) Supporting difference-based learning practices

Teachers facilitate the differences between children in the classroom because children develop according to their schedules and vary. Differences make children unique, those differences come from culture, family, temperament, multiple intelligence profiles, personality styles, special needs or developmental delays. Ways teachers can do *first* conditioning the focus of attention on the child. For example, start by playing a song, photo, or game. *Second* Divide learning into specific parts. Children are easy to focus when they receive little information. *Third,* hands-on practice. According to Sousa, direct manipulation can increase 75% of new information. Direct investigation improves sensory, helping learners focus. This allows experimentation by letting children experience trial and error, increasing the likelihood that learners will understand and build relevance to what they are learning(Sousa, 2012). *Fourth* using an integrated approach.

5) Classes accommodate children with special needs/inclusion

Children with special needs (visual impairment, hearing, cognitive impairment, motor delay, speech/language, emotional problems learn in the same environment as their peers. This will be a positive experience for all children. *First* presents a simple concept. *Second* modify tools and materials. Provide learning tools according to children's needs. *Third* recognize signs of developmental delays. Recognize delayed child development and provide additional opportunities to practice using new information and provide several methods to introduce learning concepts. *Fourth,* set goals according to the child's age and developmental stage.

6) Meaningful Learning

Sense and meaning are essential for the brain to process new information in a way that makes sense and meaning. (Sousa, 2012). *First*, leveraging prior knowledge. Connect previous knowledge with knowledge to be imparted. *Second* Use the settings. Help children to see the relationship of various information using pictures, maps, and more. *Third* hands-on practice. Learn through hands-on practice. *Fourth* Reflection. Invite children to reflect on what they learn. The method is done by asking questions to children.

Neuropedagogy as a Foundation for Moral Development in Early Childhood

An emotionally safe learning environment refers to a situation in which the child feels accepted, valued, and free from psychological and social threats. In the early age phase, the learning experience is not only influenced by the material taught, but also by the emotional nuances that accompany the process. When children feel emotionally comfortable, they will be more open to exploring, asking questions, and actively engaging in learning activities (Zins et al., 2004). Emotional safety is an important foundation that supports the formation of positive attachment between children and their learning environment, including teachers and peers.

An emotionally safe environment has a direct impact on the formation of moral values in children. In an atmosphere full of acceptance and trust, children will more easily absorb and imitate the moral behavior of the adults around them, especially teachers and parents. Children also tend to be better able to develop empathy and understand other people's perspectives when they are not burdened by fear or anxiety (Narvaez, 2014). In this context, teachers are not only facilitators of learning, but also moral models that children trust and emulate.

From a neuroscientific perspective, emotional security is closely related to decreased activity of the amygdala—the part of the brain that plays a role in processing fear and anxiety. When emotional threats or stress are reduced, the function of the prefrontal cortex—which is responsible for decision-making, self-control, and moral reflection—can work optimally (Immordino-Yang, 2016; Siegel, 2012). This internal process allows the child to think more clearly, evaluate behavior, and consider actions that are ethically appropriate. Therefore, the regulation of emotions is very important in the moral development of early childhood.

Based on these findings, it is important for educators to create a classroom environment that supports a sense of emotional security. Strategies such as building interpersonal closeness, providing positive reinforcement, and avoiding intimidating approaches need to be applied consistently (Cozolino, 2013). Such an environment not only strengthens academic learning, but also shapes children's character morally. Thus, neuropedagogy-based moral development requires the integration of a scientific understanding of the brain and pedagogical practices that are empathetic and oriented towards the development of children's emotions.

Positive emotions play an important role in the early childhood learning process. When children experience feelings of joy, pride, satisfaction, or overwhelm while learning, it not only increases motivation, but also strengthens their active involvement in learning (Pekrun & Linnenbrink-Garcia, 2012). High emotional involvement makes children feel that the learning process is something fun, not a burden, thus increasing attention, interest, and persistence towards the tasks given.

In the context of moral development, the positive emotions that children experience when doing good behavior will strengthen their tendency to repeat the behavior. For example, when a child feels proud after helping a friend or being praised for telling the truth, this emotional experience builds a strong association between moral actions and a sense of comfort or happiness (Lapsley & Narvaez, 2006). Thus, emotions are not just passive reactions to situations, but internal mechanisms that actively shape moral habits from an early age.

Neurologically, positive emotions trigger the release of neurotransmitters such as dopamine, which play a role in strengthening neural pathways related to motivation and memory formation (Immordino-Yang & Damasio, 2007). Dopamine increases synaptic plasticity—the brain's ability to form new connections between neurons—which is critical in storing learning experiences, including moral experiences. When good experiences are associated with pleasure, the brain is more likely to remember and repeat the action, reinforcing moral learning naturally.

Therefore, educators need to consciously design learning experiences that elicit positive emotions. Teachers can use methods such as role-playing, heartfelt praise, emotional reflection, and fun collaborative activities to create an exhilarating emotional environment. When positive emotions dominate the classroom atmosphere, children not

only learn cognitively, but also build a moral foundation through meaningful emotional experiences that are rooted in their long-term memory (Barrett et al., 2007).

Multisensory learning refers to an approach that involves multiple senses simultaneously—seeing, hearing, touching, moving, and even speaking—in the learning process. This approach leverages the brain's capacity to integrate information from various sensory channels, ultimately improving student attention, retention, and engagement (Shams & Seitz, 2008). In the context of early childhood, a concrete and multisensory learning process is very important because children are not yet able to think completely abstractly. Therefore, strategies that stimulate the senses in an integrated manner are very effective in instilling understanding, including moral values.

Moral experiences that involve multisensory aspects provide a greater opportunity to form deep and lasting meaning. For example, when children listen to a morally charged story, then describe the scene, and act it out in a play, they not only understand the message cognitively, but also feel emotionally and live the value physically (Immordino-Yang & Damasio, 2007). This process creates an emotional and kinesthetic attachment to moral messages, which is much more powerful than just hearing or reading.

From a neuroscience perspective, multisensory learning activates more areas of the brain than learning that relies on only one modality. The simultaneous activation of different brain areas, such as the temporal lobe (hearing), occipital lobe (vision), and motor cortex (movement), reinforces the formation of synaptic connections related to memory and emotions (Mayer, 2009). This increases the chances of information—including moral value—to be stored in long-term memory. In other words, the more brain pathways involved, the deeper the information is embedded.

For early childhood educators, it is important to design moral learning activities that involve the child's various sensory channels. Activities such as interactive storytelling, drawing value in stories, role-playing, and singing ethically charged songs not only strengthen the learning experience, but also form an internalized moral understanding through concrete experiences. With this approach, neuropedagogy provides a scientific framework to bridge the gap between the brain, body, and noble values in children's moral education from an early age.

Neuropedagogy recognizes that each child is a unique individual, with different structures, functions, and rhythms of brain development. This approach underlies the

importance of differentiation in learning, which is to provide responses that are in accordance with each child's learning style, interests, and abilities (Tomlinson, 2014). This uniqueness is not only seen in the cognitive aspect, but also in how the child responds to social situations and understands moral values. Therefore, educational strategies that respect neurodiversity are essential to create inclusive and meaningful learning experiences.

In moral formation, an approach that respects individual differences allows children to build a personal and contextual understanding of values. Each child brings a different family background, culture, and emotional experience, which will affect the way they understand and express morality. Teachers who are sensitive to this will be better able to facilitate moral development with an empathetic, non-imposing approach, and provide space for children to develop moral values based on their own rhythm and capacity (Narvaez & Lapsley, 2008).

Neuroscience research shows that the human brain develops in a unique pattern; no two brains are identical, even in identical twins (Thomas et al., 2009). Neurodiversity is a biological fact that has a direct impact on the learning process and personality formation, including morality. Differences in the structure of the prefrontal cortex, for example, can affect a child's ability to make moral decisions, show empathy, and control impulses (Decety & Cowell, 2014). Therefore, respecting the uniqueness of children's brains is an important step in building their morals authentically.

In the practice of early childhood moral education, teachers need to avoid a uniform approach and start implementing flexible, responsive, and adaptive strategies. Moral activities such as value discussions, role play, or reflection need to be adjusted to the child's developmental stages and character. For example, a reflective child may be invited to a discussion, while a kinesthetic child may be more absorbed in moral messages through drama. By respecting these differences, teachers not only support moral learning, but also foster confidence and self-worth in children.

In the neuropedagogical approach, social interaction is seen as one of the main drivers of children's brain development. Children learn through warm, responsive, and meaningful relationships with others, especially in educational settings. These interactions not only form social skills, but also affect neural pathways related to emotional regulation, communication, and prosocial behavior (Cozolino, 2013). The

learning process does not occur in isolation, but is enriched through cooperation and social dialogue.

Collaborative activities such as role-playing, group discussions, resolving conflicts together, and talking about emotions become natural arenas for moral learning. In this situation, children learn about empathy, justice, mutual respect, and the consequences of actions towards others. An environment that encourages cooperation and open communication will shape children into morally and socially sensitive individuals (Killen & Smetana, 2015).

Neuroscience, social interaction stimulates the mirror neuron system a collection of neurons that are active when a person performs an action or when observing the actions of others. This system plays an important role in understanding the feelings and intentions of others, as well as being the neurobiological basis of empathy (Rizzolatti & Sinigaglia, 2016). When a child sees his friend sad or happy, neurons in his brain respond as if he or she feels it himself, thus strengthening the ability to feel and respond morally to others.

Early childhood teachers can facilitate positive social interaction by creating inclusive group activities, getting children used to discussing feelings and social problems in a simple way, and being a model in resolving conflicts in a fair way. As children become accustomed to interacting with empathy and mutual respect, they not only form social skills, but also deepen the moral foundations that come from authentic experiences and neurological influences.

Meaningful learning occurs when children can relate learning material or experiences to their daily lives. In the neuropedagogical approach, this process is important because the child's brain more easily absorbs emotionally and socially relevant information. When learning is associated with a child's real experience—such as playing, sharing, or seeing injustice—there will be a strengthening of neuronal connections through the personal meaning formed by the experience (Caine & Caine, 1994). This fosters an emotional attachment to the values learned.

The process of internalizing moral values cannot be achieved only by conveying information. Children need to experience for themselves, reflect, and talk about situations that involve values—such as sharing toys, apologizing, or understanding their friends' feelings. Moral learning becomes stronger when teachers invite children to reflect on their actions and the consequences for others. This reflection process helps

children understand the meaning of an action and the moral reasons behind it (Narvaez, 2006).

Neuroscience research shows that reflective activity involves areas of the brain such as **the medial prefrontal cortex (mPFC),** which are the parts of the brain involved in value-based decision-making, social evaluation, and self-meaning processing (Decety & Cowell, 2014). When children engage in reflection activities on moral experiences, mPFC helps assess their actions in a social context, strengthening moral understanding biologically and psychologically. Therefore, reflective learning is not only a pedagogical practice, but also a process that directly activates moral brain networks.

Early childhood teachers can develop reflective learning activities by engaging children in light discussions after play, journaling simple pictures, or recounting their social experiences. Activities such as "story of the day" or "how do you feel when your friend cries?" encourage children to relate experiences to certain moral values. This kind of activity makes learning not only fun, but also strengthens moral foundations through cognitive, emotional, and social integration.

CONCLUSION

Moral development in early childhood is inseparable from the neurobiological, emotional, and social context in which they are experienced. This study shows that neuropedagogy is a strong foundation in shaping children's moral understanding by aligning educational practices with the natural way the brain works in processing ethical learning. Emotional safety, positive reinforcement, multisensory learning, social collaboration, and personalized learning are important pillars that support children's ability to internalize values and reflect on moral decisions.

The principles of neuropedagogy emphasize that moral education is not just about teaching right and wrong, but rather building brain structures and emotional systems that support empathy, perspective taking, and responsible behavior. The integration of this approach into the PAUD curriculum makes the learning environment a space for character growth, through real experiences and meaningful cognitive reflection. Future curriculum research and development need to be directed at the application and evaluation of these principles in various contexts of early childhood education, so that the moral growth of each child is supported by the knowledge of how they learn optimally.

ACKNOWLEDGMENT

Thank you to the graduate school of the Universitas Negeri Jakarta for supporting to conduct research in innovating moral learning for the future of Indonesian children.

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