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Neuroscience-Based Learning Innovation *Emosiku dan Otakku* in Enhancing Early Childhood Children's Ability to Recognize and Manage Emotions at TK Al-Muhajirin Pandeglang

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ABSTRACT

The application of neuroscience in early childhood education can help teachers understand how children's brains work and adapt their teaching methods accordingly. A neuroscience-based learning innovation called "Emosiku dan Otakku" helps young children understand and manage their emotions. This innovation was created in response to the need for learning that not only focuses on academics but also emphasizes the balance between children's affective, cognitive, and socio-emotional development. The "Emosiku dan Otakku" program is designed to include activities that promote play, reflection, and self-expression, such as

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storytelling about children's feelings, emotional mirror games, and breathing exercises. A descriptive qualitative method was used in this study. Data were collected through observation and documentation at TK Al-Muhajirin Pandeglang.The results showed that this neuroscience-based learning innovation helped children identify and communicate various types of emotions, as well as manage negative feelings in a healthy way. The children became more relaxed, patient, and better able to understand how their friends were feeling. Teachers also gained a clearer understanding of the importance of emotional intelligence in the learning process. The findings indicate that the "Emosiku dan Otakku" neuroscience-based learning program can strengthen the connection between the right and left hemispheres of the brain and serve as an effective method for teaching young children about emotional intelligence. terjemaahkan ke bahasa Indonesia.

Introduction

Early childhood education is crucial as a foundation for children's growth and development in the future. During this period, a child's brain and nervous system develop rapidly, forming the basis for thinking, speaking, and managing emotions (Pohan et al., 2024). Early childhood is often referred to as the golden age because approximately 80% of brain development occurs at this stage. Therefore, learning approaches must not only focus on cognitive aspects but also pay close

attention to children's emotional and social development.

Learning innovation refers to new ideas or strategies in the learning process. It is not merely ordinary teaching; rather, it involves differences in methods, media, approaches, or models used by teachers to help children learn more effectively and enjoyably. The phrase "My Emotions and My Brain" is likely the name of a model, program, or learning media developed by the researcher. Its meaning is as follows: "My Emotions" focuses on the development of children's emotional aspects—how they learn to recognize, express, and regulate their feelings, such as anger, happiness, fear, sadness, pride, and others. Meanwhile, "My Brain" relates to cognitive aspects, namely thinking skills, understanding, and problem-solving abilities. Thus, "My Emotions and My Brain" reflects the integration of children's emotional intelligence and intellectual intelligence.

One relevant approach to address these issues is the neuroscience approach in learning. Neuroscience is the science of the brain and nervous system that provides insights into how children's brains learn and respond to various stimuli (Dwiyani, 2023). The application of neuroscience in early childhood education helps teachers understand how children's brains function and adjust teaching methods accordingly. Through this approach, teachers can create enjoyable, meaningful learning experiences that stimulate both hemispheres of the brain—the left and the right—more evenly. Neuroscience examines the

nervous system, including the brain, as well as how its structure, function, and development influence human behavior and learning abilities. In early childhood, from ages 0 to 6, the brain is in a stage of rapid growth and high plasticity. Therefore, early experiences and the surrounding environment greatly influence children's brain development (Sholichah, 2020; Susanti, 2021). For example, an article on neuroscience in early childhood education states that early age is critical because "rapid brain growth and early environmental stimulation strongly influence learning abilities, social skills, and emotional well-being."

A neuroscience-based learning innovation called "My Emotions and My Brain" is specifically designed to help young children recognize and manage their feelings. This program combines activities such as play, emotional reflection, movement, and self-expression. Through these activities, children gradually learn to identify their own feelings and regulate their emotions. In "My Emotions and My Brain," children are encouraged to express emotions through activities like emotion-mirror games, storytelling based on emotional experiences, and breathing exercises to calm their emotions. These activities align with neuroscience principles that emphasize the roles of the limbic system and the prefrontal cortex in emotional regulation.

Based on these foundations, the "My Emotions and My Brain" learning innovation focuses on introducing basic emotions—such as

happiness, sadness, anger, fear, and disappointment—and helping children manage them through play and reflection. Young children need direct experiences to understand emotions, not just lectures or instructions. With this approach, children naturally learn the connection between their feelings and behaviors through daily experiences. The neuroscience-based approach also highlights the importance of balancing cognitive and affective aspects. Azizah (2023) explains that activities involving positive emotions can increase dopamine production, which supports long-term memory development. Therefore, enjoyable and emotionally rich learning experiences not only strengthen children's social interactions but also support brain functions that facilitate learning.

The ability to recognize and regulate emotions is part of emotional intelligence, which plays an essential role in shaping children's character. Children who are able to understand and manage their emotions tend to interact more easily with others, develop empathy, and handle challenges more effectively. However, field observations show that emotional management is still often overlooked in early childhood education practice (Selian, 2024). Teachers tend to focus more on academic skills such as reading, writing, and counting, while emotional education is not yet well integrated into daily learning activities.

Methods

The researcher employed a descriptive qualitative research method. Qualitative research is a type of study aimed at understanding phenomena experienced by research subjects—such as behaviors, perceptions, motivations, and actions—in a comprehensive and descriptive manner, using naturalistic references within a specific natural context. This method aims to observe and describe in detail the *Neuroscience-Based Learning Innovation "My Emotions and My Brain" in Enhancing Early Childhood Children's Ability to Recognize and Regulate Emotions at Al-Muhajirin Kindergarten, Pandeglang*. The results of this study are presented in written form and explained using descriptive language (Fitriani, 2024). In descriptive qualitative research, the situation and conditions of the study are used to illustrate, describe, and present events occurring within the research subjects (Septiani & Wardana, 2022). This research aims to collect information regarding the current state of a phenomenon (Rehalat & Ainy, 2023). Thus, descriptive qualitative research can be concluded as a type of study that provides explanations or descriptions of what is currently happening within the field (Dewi, 2025). Through this method, the researchers intend to describe the "My Emotions and My Brain" learning innovation in developing early childhood children's ability to recognize and regulate emotions at Al-Muhajirin Kindergarten. The research was conducted on October 29, 2025. The location was selected based on the researchers' considerations to carry out learning activities and observe early

childhood students.

The data collection techniques used in this study were observation and documentation. Observation is the process of collecting data directly from the field by observing and examining the conditions or subjects being studied. Observation involves examining phenomena to obtain information about the time, process, and contextual circumstances that occur. Researchers using observation techniques must pay attention to eight key aspects: setting or place, individuals involved, activities, objects or tools, time, events, goals, and feelings. Meanwhile, documentation is a technique for collecting data using written or visual materials such as documents, archives, photographs, videos, journals, books, magazines, meeting records, school documents, and activity reports (Loas, 2020). Its purpose is to obtain secondary data or supporting data that can explain the situation, processes, conditions, or research results, serving as additional or confirmatory evidence for the primary data. For example, studies that use documentation rely on tools such as cameras and video recorders. Data analysis is presented descriptively through written descriptions. Examples of written documents include diaries, life histories, biographies, rules, and policies. Additionally, visual documents such as photographs, motion pictures, and sketches are also used. These documents can provide information for exploring events occurring in the field (Adriant, 2024). Documentation also plays a role in understanding and interpreting

phenomena, developing theories, and validating data.

Results and Discussions

The Neuroscience-Based Learning Innovation *"My Emotions and My Brain"* is a new instructional approach that integrates children's emotional development and thinking skills into engaging and meaningful learning activities. In other words, this approach emphasizes not only academic and cognitive aspects but also social-emotional development. The father of the program's founder is a professor of Philosophy at the University of Al-Jazair, known for his strong intellectual and emotional capabilities. The "My Emotions and My Brain" program is designed as an innovative learning model that stimulates children's emotional development through enjoyable activities such as role-playing, recognizing facial expressions, mirroring, and storytelling about feelings. The purpose of these activities is to help children label their emotions and develop emotional resilience—specifically, the ability to remain calm, patient, and positive when facing challenging situations. Thus, the *My Emotions and My Brain* learning approach is expected to serve as an effective strategy for shaping emotionally, socially, and mentally intelligent young children, in line with character education goals in early childhood education.

Neuroscience is the study of the structure, function, and development of the human brain, as well as its relationship with behavior and learning processes. In the context of early childhood

education, neuroscience plays an important role in helping teachers understand how children's brains develop and respond to experiences. The brains of young children are in the fastest stage of growth, particularly in the limbic system (which regulates emotions) and the prefrontal cortex (which governs self-control). When children are provided with enjoyable and emotionally engaging learning experiences, the brain produces neurotransmitters such as dopamine and oxytocin, which strengthen neural connections. In other words, learning that evokes positive emotions enhances memory, concentration, and emotional regulation skills. This concept forms the foundation of the *My Emotions and My Brain* program, which is intentionally designed to stimulate both hemispheres of the brain—the right hemisphere (associated with emotional expression, imagination, and empathy) and the left hemisphere (involved in language skills and logic). By integrating both hemispheres, children not only learn to recognize emotions but also learn to manage them more rationally and effectively.

We conducted field research at Al-Muhajirin Kindergarten, an early childhood education institution located in Pandeglang. The purpose of this study was to improve young children's ability to recognize and manage emotions through a learning innovation called *"My Emotions and My Brain."* The research took place on Wednesday, October 29, at Al-Muhajirin Kindergarten and involved 15 children, consisting of 7

girls and 8 boys. The neuroscience-based learning innovation *"My Emotions and My Brain"* was designed to help early childhood learners recognize and regulate their emotions through enjoyable, reflective, and integrated activities that connect emotional aspects (*My Emotions*) with cognitive aspects (*My Brain*), in accordance with Utami (2022). These activities were carried out gradually during the core learning sessions in the classroom.

Figure 1. Facial Expression Illustration

At the initial stage, the teacher presented picture cards showing various facial expressions such as happiness, anger, sadness, and fear. The teacher then invited the children to engage in dialogue using questions such as, "When do you feel happy?" or "What makes you feel angry?" This activity aimed to help children recognize and label the emotions they were experiencing while also learning to understand the feelings of others (Sari, 2022). The purpose of implementing this innovation was to enable children to identify and name different emotions and to develop their social-emotional skills as well as their

language abilities. The neuroscience-based learning activities focused on helping children understand their feelings through four main activities: expression picture cards, expression mirrors, glitter bottles, and calming music. Before beginning, the instructor provided a simple explanation that every child experiences various feelings—such as happiness, sadness, anger, fear, and calmness and briefly described how the brain works when these emotions arise. The explanation was delivered in language that was easy for children to understand so they could relate these emotions to their everyday experiences. The children were then given the opportunity to engage in a light discussion about their experiences when feeling angry or sad, as well as how their bodies reacted. Some children explained that when they were angry, they felt like crying, shouting, or staying silent. Through this discussion, the teacher helped the children express their feelings and recognize the signs that appeared within themselves. This method aimed to train self-awareness and served as an initial step in helping children learn to manage emotions in a healthier way. The subsequent discussion was based on the direct observations conducted in the field.

Activity Photo	**Activity Description**
	During this session, the children engaged in an activity using expression mirrors. They were asked to look at their faces in the mirror and imitate several expressions such as happiness, sadness,

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	anger, fear, and surprise. The teacher guided the children in understanding the changes in their eyebrows, eyes, and mouth when displaying each expression. Afterward, the children were asked to describe situations that made them feel those emotions. This activity helped them recognize their own feelings while also fostering empathy, as they learned that their peers could experience similar emotions. The learning atmosphere was warm and interactive. The children appeared enthusiastic as they played with different expressions in the mirror. The teacher provided praise and encouragement to help them feel confident when sharing their feelings. During the reflection session, the teacher and program facilitators emphasized that recognizing and managing emotions is an essential skill that must be developed from an early age so that children can grow into calmer individuals who are better at solving problems. Additionally, this activity strengthened the connection between the school and parents, as parents were given examples of how to use glitter bottles and mirrors at home as simple strategies to support children when they are experiencing strong emotions.
Before **After**   	In the second session, the teacher introduced the glitter bottle as a tool to help children calm themselves. The children were invited to create simple glitter bottles by filling them with water and colorful glitter. The teacher demonstrated that when the glitter inside the bottle is shaken, it moves around like disorganized thoughts when a child feels angry or sad. The children were then asked to shake their own bottles and observe how the glitter slowly settles. This process was explained as a symbol that thoughts and feelings can become

	calm when the child pauses and takes a deep breath. This activity helped the children understand how to soothe themselves in an enjoyable and engaging way.
	In the final activity, the children sat in a circle while listening to soft music. The researchers used two songs: *"Baby Relaxation"* and *"Stars in the Sky."* The teacher asked the children to close their eyes and focus on the calming feelings that emerged as the music played. They were also encouraged to immerse themselves in each melody they heard. Listening to music in this way can help soothe the child's nervous system and strengthen the connection between the left and right hemispheres of the brain. A child who initially feels stressed from school activities becomes calmer when guided to listen to relaxing music. Through this series of activities, the children not only learned to recognize various types of emotions but were also trained to use simple strategies to regulate and calm themselves. Thus, the *My Emotions and My Brain* learning innovation successfully integrates and develops children's emotional and cognitive intelligence in a balanced manner, in accordance with early childhood developmental characteristics.

Through the activities described above, including imitating facial expressions from picture cards using a personal mirror, children were unknowingly able to observe changes in their own facial expressions and understand the relationship between feelings and physical

expressions. This stage strengthened their self-awareness (Sitorus, 2023). The mirror neuron system allows a person to replicate the actions and emotions of others as though they were experiencing them themselves (Nurrohman & Dahlan, n.d.). Thus, when children look at their faces in the mirror and imitate the expressions they see, they are theoretically engaging in mechanisms of imitation and self-recognition. Emotional expression refers to a person's ability to respond to an event and convey feelings through changes in facial expressions, hand movements, and other gestures (Fahrozy, 2022). Therefore, imitating expressions in front of a mirror can be considered a way to recognize one's own facial expressions, connect them with emotions, and reproduce them as a form of "self-communication" or internal reflection.

Next, in the activity introducing the "Emotion Bottle," which contains water and glitter, the teacher explained that when someone feels angry or upset, their thoughts resemble the swirling glitter in the bottle. The children were invited to shake the bottle and observe how the glitter slowly settled, which represents calmness, focus, and controlled breathing as strategies for self-regulation (Drupadi, 2023). When a child shakes the bottle, the swirling glitter stimulates the visual cortex and the limbic system—the emotional center of the brain. As the child waits for the glitter to settle, their nervous system also calms down (reducing amygdala activity, which drives fear or anger responses). This serves as a simple practice for managing emotions through visual cues

and breathing techniques. When children watch the glitter swirl, their brains learn to focus and soothe their nervous system. As they wait for the glitter to settle, they practice emotional control and patience, which contributes to the development of emotional regulation. The purpose of this application is for children to learn to control their breathing, regulate their emotions, and wait patiently—key components of emotional resilience.

To conclude the activity, the children sat together in a group while listening to soft music. The researchers used two songs: *"Baby Relaxation"* and *"Stars in the Sky."* This activity aimed to help children develop relaxation skills, self-control, and positive emotional awareness. Its purpose was to stimulate the connection between the right and left hemispheres of the brain, help children calm their nervous systems, and improve their focus and self-regulation. Listening to calm music encourages interhemispheric communication, soothes the child's nervous system, and enhances their capacity for concentration and self-control. Through this series of activities, the children not only learned to recognize various types of emotions but also practiced simple strategies to regulate and calm themselves. Thus, the *My Emotions and My Brain* learning innovation successfully integrates the development of children's emotional and cognitive intelligence in a balanced manner, aligned with early childhood developmental characteristics.

The implementation of the neuroscience-based *My Emotions and My*

Brain learning innovation demonstrated an improvement in young children's ability to recognize and manage emotions. The children became more capable of identifying various emotional expressions such as happiness, sadness, anger, and fear, and were able to express their feelings more appropriately. In addition, they showed progress in self-control when facing situations that triggered negative emotions, such as waiting for their turn or dealing with minor conflicts with peers. This improvement aligns with the principles of the neuroscience approach in early childhood education, which emphasizes the importance of holistic brain stimulation in both cognitive and emotional aspects. Neuroscience-based learning helps teachers understand how children's brains work, allowing them to design learning activities suited to the developmental stages of children's neural systems. Activities that encourage positive emotional engagement and self-reflection help strengthen neural connections involved in emotional regulation.

Moreover, this learning approach also strengthens the connection between the right and left hemispheres of the brain. The right hemisphere helps children recognize feelings and develop empathy, whereas the left hemisphere plays a role in verbal expression and managing emotions using language. Activities such as "sharing today's feelings" in the *My Emotions and My Brain* program help children express their emotions through spoken language. Thus, the left and right hemispheres work together optimally. These findings support the

notion that effective social-emotional learning involves both verbal and nonverbal expression. From a practical perspective, teachers at Al-Muhajirin Kindergarten in Pandeglang also experienced changes in how they interacted with children. Teachers became more sensitive to children's emotions and implemented learning strategies with greater empathy. It is important for teachers to strengthen their ability to understand children's emotional intelligence to create a positive learning environment (Tadjuddin, 2021). Overall, neuroscience-based learning has proven effective in helping young children recognize and manage emotions. The *My Emotions and My Brain* program is an innovation that aligns with the demands of 21st-century education, as it stimulates not only intellectual development but also builds emotional intelligence as the foundation for lifelong learning.

The research findings show that the neuroscience-based *My Emotions and My Brain* learning innovation can enhance early childhood children's ability to identify and regulate emotions. The children demonstrated positive behavioral changes, such as expressing their feelings more easily, understanding their peers' emotions, and managing themselves when encountering situations that trigger negative feelings. This indicates that learning approaches that consider how the brain and emotions function can effectively strengthen children's overall social-emotional development.

Conclusion

The neuroscience-based learning innovation *My Emotions and My Brain* has proven to be an effective method for helping preschool children recognize and regulate their emotions in a positive way. Through activities such as identifying different facial expressions, imitating expressions in a mirror, practicing calming techniques using an emotion bottle, and listening to soothing music, children are guided to understand the connection between feelings, thoughts, and actions. This method not only enhances children's self-awareness but also supports them in developing empathy and emotional regulation skills, which are essential for their social-emotional growth.

Overall, the *My Emotions and My Brain* learning approach successfully integrates the cognitive and emotional development of children in a balanced manner. This method aligns with character education principles and the needs of the 21st century, in which emotional intelligence serves as a key asset for navigating various life challenges. Therefore, this innovation is worthy of being considered a relevant and inspiring learning model for implementation in other early childhood education settings.

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