



Neuroeducation as a Supportive Approach in Enhancing Social-Emotional Development in Early Childhood

Prengki Ade Candra

Institut Agama Islam Yasni Bungo, Jambi, Indonesia

*Corresponding Author: prengkiadecandra@iaiyasnibungo.ac.id

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Abstract:

This study aims to explore how neuroeducation plays a role in supporting early childhood social-emotional development as stress management, as well as increasing children's self-awareness in learning, and social communication skills with friends in the school environment. The study is based on the importance of social-emotional skills in early childhood, which can affect their ability to interact with peers and manage emotions. The research method used is a qualitative approach with a case study design, involving interview data collection techniques, observation, and documentation with a research analysis approach according to Miles and Huberman. The findings of the study indicate that the neuroeducation program successfully helps children manage stress, increase their self-awareness, and improve social communication skills. Children involved in the program showed improvements in managing emotions, speaking confidently, and interacting more positively with peers. This study is to provide empirical evidence regarding the effectiveness of neuroeducation in developing social-emotional skills in early childhood, as well as offering a practical approach that can be applied in early childhood education institutions to support children's holistic development.

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INTRODUCTION

Early childhood education (PAUD) plays a very important role in forming the foundations of children's social-emotional development (Damayanti & Syafril, 2024). The education system for early childhood in Indonesia still faces a number of challenges related to the quality of education, the approaches used, and the provision of children's social and emotional skills (Thümmeler et al., 2022). Although many early childhood schools have implemented various programs to support cognitive development, there are still limitations in the understanding and application of approaches that focus on children's social-emotional development (Rafiyya et al., 2024; Tabroni et al., 2022). Children who have good social and emotional skills tend to have better academic abilities and interpersonal relationships (Siregar & Sit, 2024). Therefore, it is important to develop approaches that can improve the social-emotional aspects of early childhood, so that they are ready to face social and emotional challenges in the future.

A phenomenon that is often found is the presence of children who have difficulty in managing their emotions, such as anger, anxiety, or frustration. This often has an impact on their relationships with peers and their ability to participate in group activities effectively. Some children have difficulty interacting with their friends, even tending to

withdraw or become aggressive. Observations show that children who are better able to manage their feelings, such as speaking calmly or finding solutions to conflicts, have better relationships and are able to follow class activities more smoothly. Therefore, an approach is needed that can support the development of children's social and emotional skills, so that they can interact more positively with their friends and manage their feelings more effectively.

Research on neuroeducation that focuses on social-emotional development in early childhood is gaining more attention. Tabroni et al. (2022) in his research showed that education that integrates knowledge about the brain can improve emotional management and social skills in children. Social-emotional programs that teach emotional regulation skills have a positive effect on children's social relationships (Damayanti & Syafril, 2024). Research by Siregar and Sit (2024) showed that mindfulness techniques in early childhood education can increase self-awareness, which in turn helps children manage their emotions and interact more positively. An approach based on neuroscience can help children develop emotional intelligence, which is very important in managing social relationships (Harris et al., 2022; Zall & Kangavari, 2022). Thümmeler et al. (2022) emphasized the importance of developing emotional intelligence in early childhood education, with the aim of improving children's social and academic success. Educational programs that emphasize the development of social-emotional skills can improve children's overall well-being. Rafiyya et al. (2024) found that neuroscience-based exercises that focus on mindfulness and self-awareness can help children manage stress and interact more effectively. Neuroscience-based education can have a significant impact on the social-emotional development of early childhood.

There is a gap in understanding how to apply neuroscience-based methods in early childhood education settings in Indonesia, especially in more practical and applicable contexts. Most existing studies focus more on interventions at the elementary school level or in older age groups. Therefore, this study will fill this gap by applying a neuroeducation approach and assessing its impact on early childhood social-emotional skills. The novelty of this study lies in the practical application of neuroscience concepts in early childhood education, with a focus on interventions that can be applied in daily routines in kindergarten settings.

The main objective of this study is to analyze the role of neuroeducation in improving early childhood social-emotional skills at Pertiwi Mulia Bhakti Kindergarten. The focus of this study will cover several aspects, namely how the application of neuroscience-based programs can help children recognize and manage their emotions, and how neuroeducation contributes to the development of children's social skills in the context of their daily lives at school. This study seeks to provide empirical contributions that support the importance of implementing a neuroeducation-based approach in early childhood education, especially in the context of social-emotional development, which is a key aspect in the formation of children's character and social skills in the future.

The application of neuroeducation in early childhood education is very important, because early childhood is a critical period in the development of children's brains and social-emotional skills. A neuroscience-based approach provides deeper insight into how children's brains develop and how learning experiences can affect their brain development. By implementing techniques designed to stimulate brain development, such as mindfulness, emotion regulation, and self-awareness exercises, neuroeducation programs can provide children with the tools they need to manage their feelings,

communicate more effectively, and interact in a more positive way with peers. This approach not only provides short-term benefits in improving children's social and emotional skills, but also provides a strong foundation for their future development, both in academic and social contexts. By providing children with the ability to understand and manage their feelings, we can help them grow into more empathetic, independent, and competitive individuals in society.

RESEARCH METHOD

This study uses a qualitative approach with a case study type of research at Pertiwi Mulia Bhakti Kindergarten, which focuses on how neuroeducation impacts the social-emotional development of children at the school. A qualitative approach was chosen because it allows researchers to gain a more holistic understanding of the experiences, perceptions, and impacts experienced by children and educators in a more natural and real context (Williams, 2021). The case study was conducted to explore the phenomenon in depth in one specific location, namely Pertiwi Mulia Bhakti Kindergarten. Thus, this study not only explores the changes that occur in children, but also understands how the educational context and interactions within it play a role in the development of children's social-emotional skills through a neuroeducation approach.

The data collection techniques used were interviews, observations, and documentation. Interviews were conducted involving three teachers at Pertiwi Mulia Bhakti Kindergarten who were directly involved in implementing the neuroeducation program. This interview aims to obtain in-depth information about the experiences and views of teachers regarding the changes that occur in children after participating in the program. In addition, observations were made of children during teaching and learning activities to see firsthand how they interact with peers, teachers, and how they manage their emotions in various situations. These observations provide a concrete picture of the changes that occur in children's social-emotional skills. Documentation was also collected to support observation and interview data, in the form of diaries or child development reports that record their progress in social and emotional skills. These three data collection techniques complement each other to provide a comprehensive picture of the influence of neuroeducation programs on the social-emotional development of early childhood.

Data analysis in this study follows the analysis model developed by Miles and Huberman (1994) in (Köhler, 2024), which includes three main stages: data reduction, data presentation, and drawing conclusions. In the first stage, data reduction is carried out by grouping and organizing data obtained from interviews, observations, and documentation. Relevant data will be selected and summarized to facilitate further analysis. In the second stage, data presentation is carried out by compiling data in the form of narratives or tables that describe the results of the research findings. The data that has been analyzed will be presented in a clear and systematic manner so that it is easy to understand. The final stage is drawing conclusions, where researchers will draw conclusions from the data that has been analyzed, connect the findings with existing theories, and provide interpretations of the impact of neuroeducation programs on children's social-emotional development. By using the Miles and Huberman data analysis approach, this study is expected to produce a deep understanding of the influence of neuroeducation on children's social-emotional development at Pertiwi Mulia Bhakti Kindergarten.

RESULT AND DISCUSSION

The Role of Neuroeducation in Helping Kids Manage Stress

Neuroeducation combines insights into how the brain develops with educational methods that can stimulate emotional intelligence at Pertiwi Mulia Bhakti Kindergarten. One technique often used in neuroeducation programs for early childhood is deep breathing and visualization, which serve to help children recognize and overcome feelings of anxiety or fear. The main finding of this study is that neuroeducation-based programs that teach children to regulate stress have a significant impact on their ability to respond to emotional challenges. Children who participated in this program showed improvements in managing their emotions and feelings, both in social and personal situations. The results of the study provide evidence that the application of neuroeducation at the PAUD level can help children face their emotional challenges from an early age.

Application of positive visualization techniques in helping children reduce anxiety. Based on the documentation collected, the visualization process applied through teacher guidance allows children to imagine calming situations, such as being in a playground or hearing the sounds of nature. This technique has been shown to be effective in helping children overcome their fears, where many children show a decrease in anxiety after routinely doing positive visualization.

The study noted changes in children's behavior in dealing with stressful situations, showing a decrease in the frequency of aggressive or anxious behavior after visualization techniques were applied consistently. Children were also increasingly able to express their feelings in words, indicating an improvement in their emotional skills. This indicates that visualization strategies not only have an impact on children's calmness but also help them recognize and manage emotions better.

The responses of teachers and parents to the changes that occurred in children also showed positive results. Teachers and parents reported an increase in communication between children and adults, where children were more open in expressing their feelings and experiences. In addition, children's confidence in social situations also increased, as seen from their courage to speak and interact with peers and adults. Overall, this study shows that the application of positive visualization techniques at Pertiwi Mulia Bhakti Kindergarten provides significant benefits in reducing children's anxiety, improving their emotional skills, and improving communication relationships with the surrounding environment.

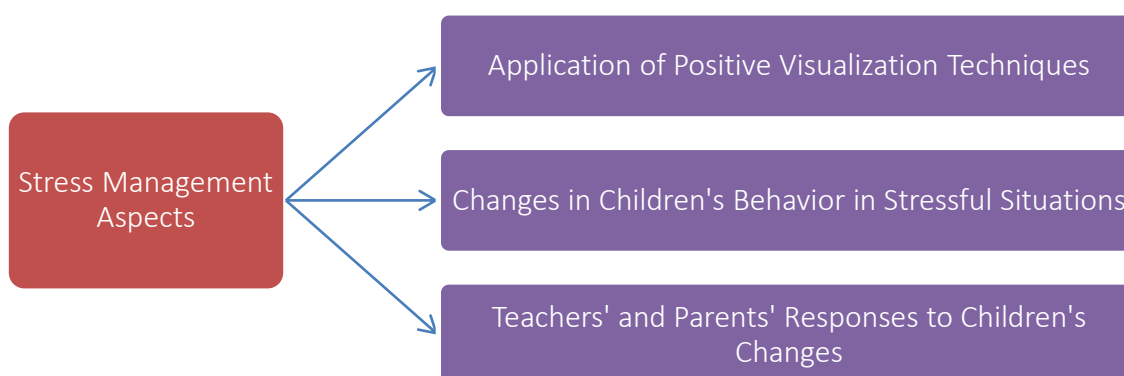


Figure 1. Stress Management Aspects

Figure 1 shows that children who participated in the neuroeducation program actively used the techniques taught in their daily lives. Positive visualization techniques also made a significant contribution, where children imagined a calming place or positive situation to reduce their stress. There were significant behavioral changes, especially in social situations, where children became more patient and tolerant of their peers. Parents and teachers reported significant improvements in children's emotional well-being, and they were more able to talk openly about their feelings. This suggests that neuroeducation techniques are not only effective in dealing with short-term stress but can also equip children with skills that are useful in managing stress in the future.

The neuroeducation program had a positive impact on children's ability to manage stress. Children who were taught deep breathing techniques and positive visualization showed significant improvements in their emotional management. They became calmer in anxiety-provoking situations and were able to deal with feelings of fear or anxiety in a more adaptive way. The use of these techniques also increased children's self-confidence, both in social interactions and in facing personal challenges. These data suggest that neuroeducation not only helps children reduce stress, but also strengthens their social skills, such as the ability to talk about their feelings and share experiences with friends and adults. Therefore, this approach has proven effective in helping young children build a strong foundation for their future emotional well-being.

Increase Self-Awareness

Self-awareness is an individual's ability to recognize, understand, and express their feelings in a healthy and situationally appropriate way. In the context of early childhood education at Pertiwi Mulia Bhakti Kindergarten, self-awareness is an important component of social-emotional development that supports children's ability to interact positively with others and manage their feelings. Neuroeducation, which integrates knowledge of brain development with educational methods based on neuroscience, is believed to help children develop self-awareness from an early age. The findings of this study indicate that children who receive neuroscience-based education experience significant improvements in their ability to recognize their own feelings and express them in healthy ways. The techniques used in the neuroeducation program, such as self-reflection and mindfulness, provide a strong foundation for children to develop emotion management skills and interact positively in a variety of social situations.

Children are taught a variety of techniques to increase self-awareness, including mindfulness techniques, self-reflection, and feelings exercises that involve identifying feelings and how to express them appropriately. The results of observations showed that children began to show improvements in recognizing their own feelings, such as confusion, anger, happiness, and fear, and were able to name these feelings when asked. In addition, they also showed an ability to express those feelings in more constructive and less impulsive ways. For example, children who typically showed aggressive behavior when frustrated were more likely to take a deep breath or talk about their feelings before acting. Teachers also reported an increase in children's ability to talk openly about their feelings, both with peers and adults.

Table 1. Aspects of Increasing Self-Awareness

Aspects	Description
Recognition of Feelings	Children can recognize their various feelings, such as anger, joy, anxiety, and fear. They begin to identify the feelings they experience in different situations.
Healthy Expression of Feelings	Children can express their feelings in a more controlled and constructive way, such as talking or taking deep breaths.
Self-Reflection	Children are able to reflect on their actions and feelings, and understand their impact on themselves and others.
Mindfulness	Children begin to do mindfulness exercises to stay present in the present moment, which helps them recognize and manage their feelings.
Positive Social Interaction	Children show improvements in social skills, such as sharing, cooperating, and managing conflicts with peers.

Table 1 shows a visualization of how children's ability to recognize and express their feelings in healthy ways improved. Children who previously had difficulty identifying their feelings, such as anger or anxiety, began to show the ability to name these feelings in certain situations. They also became more open in talking about their feelings with friends and teachers. In some cases, children who tended to be impulsive or aggressive began to use breathing techniques or take time to calm down more often when they felt frustrated. This shows that they not only recognized their feelings, but also began to understand more effective ways to manage them. The mindfulness techniques introduced in the program also proved effective in helping children stay present in emotionally triggering situations, which in turn helped them to be less quick to react emotionally. Teachers reported that children who participated in the program also became more attentive to their peers' feelings, and were better able to work together in groups.

The neuroeducation program was effective in increasing self-awareness in young children. Children who received neuroscience-based education showed a better ability to recognize their feelings, as well as express them in healthy ways. The techniques used in the program, such as mindfulness and self-reflection, help children become more aware of their feelings and give them tools to manage those feelings constructively. Children involved in the program not only became better at identifying their feelings, but also showed significant changes in how they interacted with peers and adults. They became more empathetic, were able to talk openly about their feelings, and exhibited more positive behavior in social situations. These data support the view that increasing self-awareness from an early age is an important factor in healthy social-emotional development.

Early Childhood Social Communication Skills

Social communication skills are the skills that enable children to interact effectively with peers and adults, including the ability to speak, listen, and use positive and constructive language at Pertiwi Mulia Bhakti Kindergarten. The development of these skills is essential at an early age because it forms the basis for the development of healthy social relationships, as well as academic and emotional skills in the future. Neuroeducation, with its neuroscience-based approach, is believed to help children improve their communication skills. The program involves techniques such as group speaking activities, role-playing, and activities that emphasize the importance of listening and speaking positively. The results of this study showed that children who participated in the neuroeducation program experienced significant improvements in their ability to

speak with peers, listen well, and use more positive and constructive language in their social interactions.

Teachers observed the development of children's social communication skills from the first month to the end of the program. Teachers provided insight into how the program affected the way children interacted with peers and teachers. Interview results showed that teachers saw a clear improvement in children's ability to speak more confidently, listen to their friends attentively, and express their feelings and opinions more constructively. In addition, they also observed a decrease in negative behaviors such as shouting or interrupting friends when talking. Teachers also noted that children became more open in speaking in front of groups, with more positive and less rushed language.

A teacher said, "Since starting the neuroeducation program, I see children are easier to talk to and more confident when interacting. They can not only talk to their friends, but also start to show empathy when listening. For example, children who used to have difficulty talking to their friends, now interact more in group discussions. This shows an improvement in their communication skills." (st). Another teacher said, "I also see very positive changes. Children have become more patient in listening to their friends. They no longer rush to answer or interrupt their friends, but give other friends the opportunity to speak. They also use more positive words, such as 'please', 'thank you', and 'sorry', which they rarely used before." (rn). The substitute teacher said, "What I noticed the most was the improvement in how they expressed their feelings. In the past, the kids would often get angry or upset without being able to explain what they were feeling. Now, they are starting to be able to say, 'I feel sad because of that,' or 'I don't like it because I feel it's unfair.' This definitely shows an improvement in their communication skills and managing their feelings." (ast).

The neuroeducation program has a significant impact on the development of children's social communication skills. Teachers noted that children are now more confident in communicating, both with peers and with adults. They are also more patient in listening to others, which is an important element in effective social communication. The techniques used in the program, such as group speaking exercises and role-playing, appear to help children overcome communication barriers and increase their self-confidence. In addition, children's ability to express their feelings in a healthier way, such as naming their feelings openly, is one of the main indicators of the program's success.

The neuroeducation program has a positive impact on improving children's social communication skills. Children who participated in the program showed significant improvements in speaking confidently, listening well to their peers, and expressing their feelings more constructively. The program appears to not only help children speak more effectively, but also strengthen other social skills, such as empathy, patience, and emotion management. This reflects the importance of neuroscience-based education in supporting early childhood social-emotional development. In addition, the positive changes observed by teachers suggest that neuroeducation can make a significant contribution to equipping children with communication skills that will be useful throughout their lives.

Discussion

Neuroeducation offers a holistic approach to helping young children manage stress. The techniques used—such as deep breathing and visualization—serve to stimulate the brain in ways that facilitate emotional regulation (Drigas et al., 2021). The results of the study are consistent with the theory that young children can be trained to develop better emotion regulation skills through interventions based on an understanding of their brain development. Unmanaged stress in children can interfere with their social and emotional development, so an approach that integrates knowledge about the brain may be an effective solution. In addition, the program contributes to the development of children's social skills, which are essential in early childhood education (Gkintoni et al., 2022; Zhang et al., 2023). Neuroeducation is not just an educational trend, but an approach that has been proven to improve the emotional and social well-being of young children.

McCormick et al. (2021) showed that training in social skills and emotion regulation at an early age has a positive long-term impact on children's mental health. Children who are trained in stress regulation techniques are better able to cope with anxiety and stress later in life (Crowell, 2021; Tripathi et al., 2022). Beelmann and Lösel (2021) also found that an emotion regulation-based program involving breathing techniques and visualization can reduce aggressive behavior and improve children's social relationships. Early social-emotional education can reduce stress levels and improve emotional well-being (Richter et al., 2022). Paley and Hajal (2022) suggests that implementing in-depth social-emotional education programs, such as neuroeducation, can improve children's life skills and help them manage stress effectively. The neuroeducation approach is an effective intervention in helping children manage stress and develop healthy social skills.

Neuroeducation not only helps children develop emotional management skills, but also builds a foundation for broader social skills. Self-awareness is a key component of emotional intelligence, which includes the ability to recognize one's own feelings, manage those feelings, and understand the impact of emotions on behavior and social relationships (Utama & Akbar, 2023; Villavicencio, 2023). The techniques used in neuroeducation programs, such as mindfulness, help children stay focused on their feelings without becoming overwhelmed by emotions. This gives them space to respond to social situations in a calmer, more rational manner. Furthermore, the self-reflective skills taught in these programs allow children to evaluate their actions and learn from their experiences, which are essential to the development of healthy social skills.

Villalobos and Salazar (2023) found that children who were taught to recognize their feelings through neuroscience-based techniques were better able to manage stress and negative feelings. Mindfulness-based programs help children become more aware of their feelings and improve their social relationships with peers (Sciutto et al., 2021; Thierry et al., 2022). The ability to recognize and manage feelings is a foundational skill that forms emotional intelligence, which is essential for social and academic success (Kryza-Lacombe et al., 2021; Zubaidah et al., 2024). High self-awareness can reduce aggressive behavior and improve children's ability to interact with others positively. Finally, research by Erten and Güneş (2024) shows that education that emphasizes the development of self-awareness can help children reduce stress and improve emotional well-being.

Children's social communication skills can be improved with an approach based on neuroscience. One important aspect of communication skills is listening skills, which require full attention and self-control (Rowland et al., 2023; Sanjani et al., 2024). Neuroeducation programs that teach children to be more focused and aware of their emotions through techniques such as mindfulness and self-reflection play a role in improving their listening skills. In addition, speaking confidently and constructively also relies heavily on a child's ability to understand their own feelings and express them appropriately. Neuroscience-based programs help children learn to express their feelings in healthier and less destructive ways (Andreu et al., 2021). Neuroeducation can equip children with social communication skills that are essential for their future development.

Dai et al. (2022) found that children who were trained to recognize and manage their emotions were better able to communicate effectively in social situations. Social-emotional programs involving stress management techniques can improve children's communication skills with peers. Mora et al. (2024) added that mindfulness-based programs and emotion regulation can strengthen children's ability to listen and speak in a more positive way. Social-emotional education focused on communication skills can improve children's emotional well-being and social relationships (Bhargava & Ramadas, 2022). Nievas and Montes (2023) emphasized that good communication skills in children can contribute to their academic and social success, especially at an early age. The results of the study contribute to improving the impact of social communication skills of early childhood.

CONCLUSION

The implementation of the neuroeducation program at Pertiwi Mulia Bhakti Kindergarten can improve the social-emotional skills of early childhood. Children involved in this program showed positive developments in their ability to manage emotions, communicate with peers, and interact more empathetically and constructively. The program helped children recognize their feelings and express them in a healthy way, which in turn supported the development of better social relationships. Teachers indicated that they observed an increase in children's self-confidence and ability to manage conflict and work together in groups. These findings strengthen the understanding that a neuroscience-based approach can make a significant contribution to the social-emotional development of early childhood, which is very important for their readiness to face social and academic challenges in the future. The limitations of the study lie in the limited duration of the study also limiting the understanding of the long-term impact of this neuroeducation program. For further research, it is recommended to expand the research location and involve more educational institutions to obtain more representative results.

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