

The Use of Recycled Educational Tools to Develop Emotional Competence in Early Childhood: A Case Study at TK Tunas Harapan Bangsa, PTPN IV REG 4, Muhajirin Village

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Abstract

Emotional development is a fundamental aspect of early childhood education that should be nurtured through engaging, meaningful, and contextually relevant learning activities. However, the use of learning media that optimally stimulate children's emotional development, particularly by utilizing resources from the surrounding environment, remains limited. This study aims to describe the use of recycled educational materials in fostering young children's emotional development at Tunas Harapan Bangsa PTPN IV Reg IV Kindergarten in Muhajirin Village. This study employed a qualitative approach with a descriptive research design. The research subjects comprised the principal, classroom teachers, young children, and parents as supporting informants, selected through purposive sampling. Data were collected through observation, interviews, and documentation and analyzed using an interactive model consisting of data reduction, data presentation, and conclusion drawing. Data validity was ensured through source, technique, and temporal triangulation. The findings indicate that recycled educational tools made from natural materials available in the surrounding environment can create enjoyable and meaningful learning

experiences for children. Activities such as collage-making and other creative projects supported emotional development, as reflected in increased self-confidence, cooperation, patience, emotional self-regulation, responsibility, and empathy toward peers. This study concludes that recycled educational materials can function as effective, economical, and contextually relevant learning media for supporting emotional development in early childhood. The findings contribute to early childhood education by demonstrating how environmentally based learning media can simultaneously foster emotional competence and cultivate environmental awareness from an early age.

Keywords: Recycled Educational Materials; Emotional Development; Early Childhood Education; Learning Media; Environmental Awareness

INTRODUCTION

Early Childhood Education (*Pendidikan Anak Usia Dini/PAUD*) is an important foundation in shaping a child's overall development, including the emotional aspect, which forms the basis of a child's ability to recognize, manage, and express feelings appropriately (Muslim, 2026). Optimal emotional development during early childhood contributes to a child's success in establishing social relationships, building self-confidence, and facing various challenges in the learning environment and daily life (Permatasari, 2025). Globally, various international institutions emphasize the importance of stimulating socio-emotional development from an early age because this period is the golden age for brain development and character formation (Masran, 2026). The World Health Organization (WHO) states that investment in early childhood development has a long-term impact on the quality of human resources and the well-being of society (World Health Organization (WHO), 2026). In Indonesia, strengthening the socio-emotional aspect is also one of the main developmental achievements that must be developed through meaningful and enjoyable learning activities for children.

In practice, the emotional development of early childhood still faces various challenges. Many early childhood education institutions focus more on developing cognitive and academic skills than on social and emotional stimulation (Astuti & Triani, 2024). This condition causes children to experience difficulties in controlling emotions, collaborating with peers, and expressing feelings positively. Furthermore, the limited availability of engaging learning media that are appropriate for the characteristics of early childhood is a factor inhibiting emotional development. Recent research shows that interactive and

experiential learning media can help improve children's emotional abilities by providing opportunities for exploration, imagination, and active interaction (Gea & Zega, 2025). Therefore, innovative learning media are needed that are not only economical but also able to stimulate children's emotional development optimally.

One alternative that can be used is educational tools made from recycled materials. The use of recycled materials as learning media has various advantages, such as being easily obtained, environmentally friendly, inexpensive, and able to increase children's involvement in the learning process (Fitri et al., 2026; Lestari, 2025). Research by Nisa and Ulfah (2025) shows that recycled media can increase creativity in early childhood through exploratory activities and experiential learning. Similarly, research by Husain et al. (2024) found that the use of recycled materials as educational media can increase children's learning participation, creativity, and environmental awareness. In addition to supporting cognitive development and creativity, recycled educational tools also have the potential to be a means to train children's emotional management, cooperation, empathy, and problem-solving skills during play activities.

However, the literature review shows that most previous studies still focus on the influence of recycled media on creativity, cognitive abilities, and environmental awareness in early childhood. Research by Afifah et al. (2026) emphasized the 3R-based learning method (reuse, reduce, recycle) to enhance children's creativity, while Wati et al. (2025) examined the use of recycled media in enhancing creativity. Research by Purbayani and Ali (2025) also focused on the use of bottle caps for children's cognitive development. On the other hand, research on the development of social-emotional aspects has mostly examined the use of conventional educational games (Aulia & Sudaryanti, 2023). Thus, there is still a research gap regarding how the use of recycled educational tools can specifically be used to develop the emotional aspects of early childhood, especially in educational contexts such as Tunas Harapan Bangsa Kindergarten PTPN IV Reg 4 Muhajirin Village.

Based on these gaps, this study aims to describe and analyze the use of recycled educational tools in developing the emotional aspects of early childhood at Tunas Harapan Bangsa Kindergarten PTPN IV Reg 4 Muhajirin Village. Specifically, this study seeks to identify the forms of recycled educational tools used by teachers, their implementation process in learning activities, and their impact on children's emotional development, such as the ability to recognize emotions, control feelings, show empathy, and interact positively with

peers. This study also seeks to understand how recycled media can be an effective learning tool and be appropriate to the characteristics of early childhood.

This research is expected to provide both theoretical and practical contributions. Theoretically, the results can enrich studies on the use of recycled-based learning media in developing the social and emotional aspects of early childhood, which to date is still relatively limited compared to studies on cognitive and creativity aspects. Practically, this research can serve as a reference for early childhood education teachers, school administrators, and parents in developing innovative, economical, and environmentally friendly learning media to support children's emotional development. Furthermore, this research also supports the implementation of sustainable education through the use of recycled materials as educational tools with pedagogical and ecological value.

METHODS

The researchers in this study used a qualitative approach with a descriptive qualitative approach (Sugiyono, 2019). This approach was chosen because the study aimed to gain an in-depth understanding of the use of recycled educational tools in developing the emotional aspects of early childhood at Tunas Harapan Bangsa Kindergarten, PTPN IV Reg IV, Muhajirin Village. The research design used was a case study because it focuses on phenomena occurring in a specific setting in depth and context (Rijali, 2019; Sugiyono, 2017). The study population included all school members involved in the early childhood learning process at Tunas Harapan Bangsa Kindergarten. Participants were selected using a non-probability sampling technique with a purposive sampling method, which selects informants based on the consideration that they possess information relevant to the research focus.

The study subjects consisted of one principal, two class teachers, ten early childhood students actively participating in learning activities using recycled educational tools, and three parents selected as supporting informants. The participants were selected based on their direct involvement in the planning, implementation, and evaluation of the use of recycled educational tools. Data collection techniques included participant observation, semi-structured interviews, and documentation. The research instruments consisted of observation guidelines, interview guidelines, and documentation guidelines, developed based on early childhood emotional development indicators in the Child Development Achievement Level Standards (STPPA) and a literature review on children's social-emotional

development. In qualitative research, the researchers act as the primary instrument, conducting observations, data collection, interpretation, and drawing meaning from field findings (Rukin, 2019; Yusuf, 2016).

The research procedure was carried out through several systematic stages: preparation, implementation, data analysis, and report preparation. During the preparation stage, the researcher conducted a literature review, initial observations, developed research instruments, and obtained research permits. The implementation stage involved observing learning activities utilizing recycled educational tools, conducting in-depth interviews with principals, teachers, and parents, and collecting documents in the form of activity photos, lesson plans (RPPH), learning notes, and children's work. Data analysis was conducted interactively using Miles and Huberman (1994) model, which includes data reduction, data presentation, and drawing conclusions or verification.

RESULTS

Utilizing Recycled Educational Tools Based on Natural Materials to Develop the Emotions of Early Childhood

This study aims to describe the use of recycled educational tools in developing the emotional aspects of early childhood at Tunas Harapan Bangsa Kindergarten PTPN IV Reg IV Muhajirin Village. Based on the results of observations, interviews, and documentation conducted during the study, it was found that the use of recycled educational tools made from natural materials available in the school environment has a positive influence on children's emotional development. The materials used in learning activities come from the surrounding environment, such as leaves, dried flowers, and plant parts that are easily found in plantation areas. The use of these materials is then created into learning media in the form of collages and simple artwork that involve the active participation of children. These activities not only provide a fun learning experience, but also serve as a means for children to develop various emotional abilities appropriate to their developmental stage.

Based on observations, the children showed high enthusiasm throughout the activity. This was evident when the teacher introduced the materials to be used in the collage activity. Most of the children demonstrated high curiosity by touching, observing, and selecting materials to be attached to the drawing media. This enthusiasm was evident in the children's cheerful facial expressions, active involvement during the activity, and desire to complete the

assigned tasks. This condition indicates that the use of recycled educational tools can create a pleasant learning atmosphere so that children feel comfortable in participating in the learning process. Feelings of comfort and happiness are one form of positive emotion that is important to support learning success in early childhood.



Figure 1 Recycling Process Carried Out by One of the Children

Figure 1 shows that the learning activity was conducted in groups. The children sat together while arranging and pasting materials provided by the teacher onto colored picture media. During this process, there was quite good interaction between the children. They shared materials, discussed where to paste them, and helped friends who were having difficulties. This situation demonstrates that activities using recycled educational tools can be a means of developing collaboration skills. Collaboration is an important indicator of emotional development because it teaches children to respect others, understand the needs of their peers, and build positive social relationships in the learning environment (Irwan et al., 2023).

The research results showed an increase in children's self-confidence, which was evident in their behavior after completing collages. When the children finished their work, several enthusiastically showed their collages to their teachers and peers, received praise, and responded to the appreciation with expressions of pride. This behavior was not merely a temporary emotional reaction. Observations revealed real behavioral changes—for example, previously passive children now taking the initiative to show their work—indicating an increased recognition of their own competence. Positive responses from the environment (praise from teachers, attention from peers) appeared to reinforce feelings of competence (Arifin & Ichsan, 2024; Ichsan et al., 2023; Ichsan & Samsudin, 2019), so that the process of

creating the work served as a learning experience that validated the children's individual capacities.

The impact of developing self-confidence from an early age is functionally important for children's social and cognitive competence later in life. The confidence developed through creative activities such as collage-making fosters the courage to communicate, take social initiative, and face new challenges—for example, attempting more complex tasks or participating in group activities. Theoretically, these findings are consistent with the concept of self-efficacy: experiences of concrete success increase confidence in the ability to complete similar tasks in the future. Therefore, the integration of creative activities that provide opportunities for achievement and positive feedback can be recommended as an intervention strategy in early learning programs to develop children's emotional and social aspects in a sustainable manner.

The Impact of Recycled Collage Activities on Cooperation, Self-Confidence, and Empathy in Early Childhood

During collage activities, children not only develop fine motor skills but also learn to control their emotions and develop patience. The sequential process of collage—selecting materials, applying glue, and attaching materials to the pattern—encourages children to follow the steps step by step and wait for their turn or the final result. When these steps don't go smoothly, for example, the materials are difficult to adhere or the visual result differs from expectations, children are faced with the need to suppress frustration and reorganize their work. Repeated experiences like this foster emotional regulation: children learn to recognize feelings of disappointment, calm themselves, and try again with a better strategy (Miftahuljana et al., 2025).

The teacher's role is crucial during these challenging moments. In addition to providing technical instructions, teachers provide supportive guidance—setting examples, breaking tasks down into smaller steps, or modeling how to overcome failure—and encourage children to keep trying until they succeed. Positive reinforcement and praising effort rather than results help children internalize the value of perseverance (Karadeniz, 2023). With the right intervention, teachers transform potentially frustrating situations into emotional learning opportunities, so children not only complete tasks but also gain practical emotional management skills.

The use of recycled educational tools adds another dimension to the learning process. According to interviews with classroom teachers, children demonstrate greater engagement and focus when working with familiar materials from their surroundings. The immediacy of the experience—seeing, touching, and recognising familiar objects—makes collage activities feel more meaningful and relevant. Beyond aesthetic aspects such as shape, color, and texture, children learn to relate learning materials to everyday life contexts, making learning more contextual and stimulating curiosity (Nirwana et al., 2025).

In addition to emotional regulation and focus, collage activities also facilitate the development of prosocial behavior, particularly empathy. Field observations show that many children spontaneously help friends in difficulty, for example, helping them glue, fetch materials, or offering encouragement when their friends are disappointed because their work is not yet satisfactory. These small actions indicate the development of the ability to see others' perspectives and care for the needs of others. Empathetic behavior that emerges in the context of play and creation lays the foundation for more complex social skills, such as cooperation and conflict resolution (Sari & Hendayani, 2025).

Collage activities using recycled media are not simply art exercises; they serve as an integrated platform for developing children's social-emotional competencies. Through a series of sequential tasks, supportive teacher intervention, and contextualized materials, children learn to manage disappointment, practice patience, and develop empathy for their peers. Because these skills are essential for adapting to various life situations, integrating similar activities into the curriculum can strengthen the foundation of children's emotional and social development from an early age.



Figure 2: Results of Children's Creative Recycling

Documentation of the results shows that each child produces unique work even though they use the same materials and themes, reflecting the freedom of expression in the learning process. In the recycled material collage activity, children are given the opportunity to choose the placement of materials and the shape of the work according to their wishes, allowing ideas, feelings, and imagination to be directly channeled. Recognition of ideas and work by educators or peers fosters positive emotions; when children feel appreciated, their intrinsic motivation to explore and learn increases, which in turn strengthens their self-confidence and courage to try new things.

Research findings emphasize the important role of recycled educational tools made from natural materials as learning tools that provide concrete experiences for young children. Through active involvement—designing, selecting materials, collaborating, and solving practical problems—children learn not simply to receive information but to experience the creative process directly. This concrete experience aligns with the cognitive developmental characteristics of early childhood, who are more likely to understand learning through touch, object manipulation, and social interaction, making learning more meaningful and effective.

The use of recycled educational tools at Tunas Harapan Bangsa Kindergarten, PTPN IV, Reg. IV, Muhajirin Village, has positively contributed to the emotional development of young children. Visible impacts include increased self-confidence, the ability to work together, patience, emotional control, empathy, and pride in their own work. In addition to supporting emotional aspects, activities utilizing environmentally friendly materials also instill awareness and care for the environment from an early age, making recycled educational tools a suitable alternative for holistic and sustainable learning media.

DISCUSSION

Re-Understanding Early Childhood Emotional Development

Emotional development is a crucial aspect of early childhood development, related to the ability to recognize, understand, express, and control one's own and others' feelings. Optimally developed emotional skills will help children build positive social relationships, adapt to their environment, and navigate various life situations more healthily. According to Santrock (2023), emotional development in early childhood is the foundation for developing social competence, self-regulation skills, and mental health in later stages of development.

At an early age, children begin to learn to recognize various emotions, such as happiness, sadness, anger, fear, disappointment, and pride. As they grow older, children also begin to understand the causes of emotions and learn to control the responses they evoke. In the Child Development Achievement Level Standards (STPPA), children's emotional development is demonstrated through various indicators, such as the ability to recognize feelings, demonstrate self-confidence, control simple emotions, wait their turn patiently, cooperate with friends, demonstrate empathy, and take responsibility for assigned tasks.

Table 1. Indicators of Early Childhood Emotional Development

No	Emotional Development Indicators	Description of Observed Behavior
1	Recognizing various feelings	Children are able to recognize and name feelings such as happy, sad, angry, afraid and disappointed.
2	Showing self-confidence	Children dare to appear in front of friends, express opinions, and try new activities without excessive fear.
3	Controlling simple emotions	Children are able to calm themselves down when they are angry, disappointed, or have difficulties in playing and learning.
4	Showing patience	Children can wait their turn while playing or taking part in learning activities with friends..
5	Collaborating with friends	Children are able to interact, share tasks, and complete activities in groups.
6	Showing empathy	Children care about their friends' feelings, help friends who are having difficulties, and show sympathy.
7	Responsible	Children are able to complete the tasks given and tidy up the play equipment after use.

Source: Adapted from the Ministry of Education, Culture, Research, and Technology's Child Development Achievement Level Standards (STPPA) (2022).

Based on Table 1, the emotional development of early childhood can be observed through various behavioral indicators that emerge in daily activities. The ability to recognize feelings, control emotions, demonstrate self-confidence, cooperate, and have empathy are important aspects that need to be continuously stimulated. In the context of this research, the use of recycled educational tools made from palm oil waste is seen as capable of providing learning experiences that support the emergence of these indicators (Zarin et al., 2023). Through activities such as making, assembling, and playing with educational tools from shells, palm fronds, and palm leaves, children have the opportunity to interact, cooperate, solve problems, and express their feelings positively, thus enabling optimal emotional development.

The learning environment plays a crucial role in supporting a child's emotional development. Learning activities that provide opportunities for children to explore, interact,

and solve simple challenges can help them learn to better manage their emotions. When children are given the opportunity to create, they learn to face challenges, develop patience, and experience a sense of satisfaction after successfully completing a task. These experiences indirectly contribute to the development of positive emotional regulation (Skinner et al., 2014).

Utilizing palm oil waste as a recycled educational tool also contributes to children's emotional development. Through activities like making and playing with toys from shells, palm fronds, and coconut leaves, children learn to cooperate with friends, share materials, wait their turn, and appreciate the work of others. Furthermore, successfully completing a project fosters pride and self-confidence. This process demonstrates that learning media derived from the surrounding environment can be an effective means of stimulating the social-emotional development of early childhood.

The Relationship Between Recycled Educational Tools and Children's Emotional Development

Using recycled materials for play and learning gives children a low-stakes environment to experiment emotionally. Unlike expensive store-bought toys, recycled items invite open-ended use, which reduces fear of “ruining” something and encourages risk-taking. That freedom lets children test emotional responses—curiosity, frustration, pride—without high consequences, so they learn which feelings arise in different situations and begin to label them. Over repeated experiences, children build a vocabulary of internal states and become better at noticing when they are excited, bored, anxious, or satisfied (Cheng, 2023).

The creative construction process itself functions as an emotional training ground. When a child's plan for a recycled craft fails—glue won't hold, parts don't fit, colors clash—they face small setbacks that require patience and problem solving. Managing these setbacks cultivates tolerance for frustration and develops strategies like taking breaks, asking for help, or trying alternatives. Successful repairs or adaptations produce feelings of mastery and resilience; the child learns that setbacks are surmountable, strengthening self-efficacy and emotional persistence.

Group activities using recycled tools intensify social-emotional learning. Making something together requires turn-taking, negotiating roles, and coordinating actions, which brings up emotions tied to fairness, recognition, and belonging (Fisher et al., 2020). For

example, disagreement over design choices can trigger disappointment or anger; resolving it—through compromise or persuasive expression—teaches children to regulate impulses and communicate feelings constructively. These micro-interactions reinforce empathy as children name peers' perspectives ("You wanted the red cap; I like blue"), and they practice responding to others' emotional cues.

The symbolic and narrative possibilities of recycled materials also support emotional processing. Simple objects can become characters, props, or settings in imaginative play that let children project feelings and rehearse social scenarios safely. A cardboard box becomes a boat for a child practicing separation from a caregiver, or a puppet made from a bottle becomes a vehicle for expressing jealousy or pride indirectly. This distancing effect makes difficult emotions easier to explore and discuss, facilitating emotional insight and the ability to tell coherent personal narratives about feelings.

The sustainability framing adds a values dimension that influences emotional development. Using recycled materials often comes with conversations about caring for the environment and resourcefulness, which can nurture pride, responsibility, and a sense of purpose. When children see their creations valued by adults—displayed or praised—they gain social validation that boosts self-worth. Conversely, when materials are scarce or shared unequally, educators can use those moments to teach equity and emotional fairness (Brummelman et al., 2016). In sum, recycled educational tools create repeated, low-risk contexts for emotional expression, regulation practice, social negotiation, imaginative processing, and value formation—all central to healthy emotional development.

CONCLUSION

In conclusion, this case study at Tunas Harapan Bangsa PTPN IV Reg IV Kindergarten shows that recycled educational tools made from local natural materials meaningfully support early childhood emotional development by creating engaging, low-stakes, and contextualized learning experiences; through collaborative collage and craft activities children demonstrate increased self-confidence, emotional regulation, patience, empathy, and cooperative skills while also developing environmental awareness, indicating that inexpensive, sustainable recycled media—when guided by supportive teachers—are an effective and appropriate strategy for fostering socio-emotional competencies in early learners.

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