

CENTER LEARNING INNOVATION: IMPLEMENTING THE STEAMLY PLUS APPROACH TO DEVELOP CREATIVITY AND SKILLS IN EARLY CHILDHOOD

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Abstract: This research aims to analyze the effectiveness and impact of implementing the center learning model with the Steamly Plus approach on developing basic skills and children's learning interests. The STEAMLY Plus approach emphasizes creativity, critical skills, and problem solving which are very important for the cognitive and emotional development of early childhood. This learning is the foundation for developing 21st century skills. The method used is classroom action research conducted by teachers in their classes through self-reflection carried out in a planned, systematic, and repeated manner in an action cycle. The study results showed that implementing STEAMLY Plus in the Center Learning Model at PAUD Islam Makarima Sukoharjo was 70% effective in improving children's holistic skills. The impact of implementing the STEAMLY Plus approach on improving children's holistic skills includes balanced development in various aspects. Cognitively, children experience increased abilities through activities integrating science, technology, engineering, art, and mathematics. In terms of social and emotional, children learn to interact and collaborate. Interest in learning is seen directly in learning activities, such as actively participating in experiments, discussions, or projects. Children with concrete learning interests tend to be more enthusiastic, open to new experiences, and willing to repeat enjoyable activities.

Keywords: Early Childhood Education, Effectiveness, Center Learning Model, STEAMLY Plus

A. Introduction

Early childhood education (PAUD) is crucial in forming children's cognitive, social, and emotional foundations. PAUD quality varies greatly in Indonesia, and many educational institutions struggle to establish productive learning environments. Since early childhood education is the first step in developing children's character, it is the starting point for improving education (Sudarti & Diana, 2023). Based on data from the Central Statistics Agency (BPS) in 2024, the gross participation rate of children attending PAUD only reached 36.03%. Of that number, only around 50% received quality PAUD services. This low participation rate and inequality in the quality of services indicate that many children still have not received access to optimal early childhood education (Statistics, 2024). This is in line with the research (Nur Azizah et al., 2022). This states that the uneven quality of facilities and infrastructure is an obstacle to establishing PAUD in Indonesia. This gap affects the effectiveness of the learning process and the quality of early childhood education services.

Quality education in PAUD can optimize children's potential by utilizing various innovative models and approaches. STEAM (Science, Technology, Engineering, Arts, and Mathematics) is one of the educational innovations in Indonesia that seeks to increase technology-based capacity (Nurhikmayati, 2019). The STEAM approach can develop children's critical thinking skills and creativity. Creativity affects other aspects of development, so if it is not developed early on, children's intelligence will not develop optimally (Hasanah et al., 2021). Meanwhile, critical thinking trains children to think critically, independently, and reflectively (Sari et al., 2021). However, this approach is often limited to academics and pays less attention to emotional balance and integrating various learning areas. The STEAMLY Plus model, which integrates Literacy into STEAM, has not been studied in depth, especially in the context of PAUD in Indonesia. This article's scientific novelty lies in applying the Sentra learning model with the STEAMLY Plus approach at PAUD Islam Makarima Sukoharjo, which has never been done before. This approach aims to not only improve children's cognitive and social skills but also their emotional balance. This study focuses on how applying the Sentra Learning Model with the STEAMLY Plus approach can

impact the quality of education and child development at PAUD Islam Makarima Sukoharjo. This method is expected to improve children's social skills, creativity, and learning engagement. This study aims to evaluate the effectiveness and impact of the STEAMLY Plus approach in the context of early childhood education and to provide recommendations for implementing similar models in other educational institutions. This article is an original contribution to the educational literature by highlighting innovations in learning models and integrative approaches that can be applied in early childhood education in Indonesia.

Center learning is a learning model that makes playing in centers and circles a vehicle for children to learn. This approach places more emphasis on environmental exploration activities. This STEAM learning method stimulates and strengthens children's ability to interpret their activities because children do it directly according to their creativity and abilities, and are linked to their surrounding environment (Atiaturrahmaniah et al., 2022). This study raised the theme of center learning with the STEAMLY Plus approach, namely Science, Technology, Engineering, Art, Mathematics, and Literacy PLUS, which means teaches about *aqidah*, *fiqh*, morals and the role of *sirah* which raises the stories of the prophets, stories of the prophet's family, Islamic stories where costumes are used according to their roles.

B. Method

This research is a type of classroom action research because the teacher conducted this research in his class through self-reflection, which was carried out in a planned, systematic, and repeated manner in the action cycle (Utomo et al., 2024). Recently, research results have shown that PTK can be a strategic method for educators to improve or repair educational services in the context of classroom learning (Susilowati, 2018).

In this study, the research design used by Kemmis & McTaggart is a development of the basic concept introduced by Kurt Lewin. However, only the components of action (acting) and observation (observing) are made as one unit. The two components are unified because the implementation of action and observation is an inseparable unit. This means that both activities must be carried out in one unit of time, so that an action occurs, and observation must

be carried out. To be more precise, the following is a presentation of the design form of Kemmis & McTaggart (Arikunto, 2010).

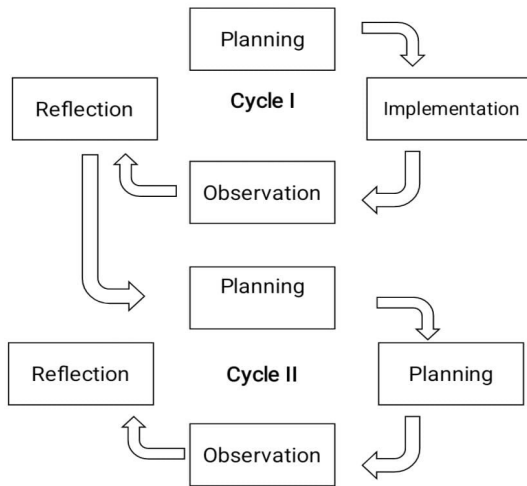


Figure 1. *Classroom Action Research Cycle*

The data collected through observation techniques are data on children's and teachers' activities and the achievement of children's abilities, which shows a critical attitude in solving problems. Then, interview techniques were used between teachers and children through simple questions asked by teachers to their students. The number of teachers at KB Islam Makarima is 10, and the number of students is 41, with an age range of 2-4 years. The data obtained is entered into the documentation. This documentation complements the observation methods that observers will carry out in observing children's activities, teacher activities and the level of achievement of the ability to demonstrate critical attitudes in solving problems.

Data triangulation in classroom action research is a technique for checking or comparing data validity. The triangulation used is source, technique, and time triangulation.

1. Source triangulation, comparing the results of interviews with teachers, students, and principals.
2. Technique triangulation, combining observation, interview, and questionnaire data to see student participation in learning.
3. Time triangulation, observations are carried out at the cycle's beginning, middle, and end to see changes in student behavior.

C. Results and Discussion

1. Center Learning Model

Center learning or Beyond Center Circle Time (BCCT) is a benchmark for early childhood education focusing on the center and periphery. This center and circle of learning are learning resource centers, one of the benchmarks of which is to stimulate all perspectives of child development, aged 0 to 6 years. Basic learning involves introducing and exposing children to the real world, including school. In each center, children play with new things by combining the knowledge gained with its application in everyday life. The advantage of center learning is that it uses a special learning model based on children's interests and skills (Fitri et al., 2022).

a. Sentra life skill

Early Childhood Education (ECE) refers to the educational process designed for children from birth to six years of age. The period from birth to the first stage of elementary education is called the golden age and is a stage of life that will determine the next stage of a child's development (Prasetiawan, 2019). Early Childhood Education aims to support children's physical, cognitive, social, and emotional development through various activities appropriate to their developmental stage.

Practical Life Skills is an example of a Montessori approach where, in this approach, children learn about activities that will be carried out in everyday life, and this is very useful for the future (Kurniawati & Hayati, 2020). Life skills also teach independence in early childhood, which can be defined by forming the quality of children, allowing them to not depend on others, especially parents. The aspect of independence from an early age is important because, at this age, preschool children learn to be independent, not dependent on their family or parents, and enter a larger environment, namely an environment that is a potential that needs to be developed in institutions. Early childhood education has proven important in forming children's independence. Children who are not independent will hurt the development of their personalities. When a child lacks self-confidence and cannot face life's challenges, it is not only a physical problem, but also a psychological one that makes children feel confident, responsible, and able to make their own decisions. Therefore, it is important

to instill independence from an early age so that children become more positive and responsible individuals with the tasks that have been given (Yoga Purandina & Astra Winaya, 2020).

Teachers at PAUD Islam Makarima Sukoharjo have a significant role because, in the process of developing children's independence, teachers can develop various educational schemes, create a learning atmosphere, and incorporate independent learning into children's learning activities both in class and outing classes so that children can work together and interact competently with each other. An example in this case is understanding the importance of obtaining early childhood life skills education at all levels of early childhood education. With this, we can equip children with a strong foundation to succeed in the future, to be better than the current generation, and to adapt independently to social conditions. Able to respond to globalization trends and use possibilities creatively. Children between the ages of 4 and 5 have a strong sense of curiosity and memory, allowing them to develop life skills early. If you teach your child what you find interesting and exciting, your child can understand easily (Kuswanto et al., 2023).



Figure 2. *Documentation of Life Skill Center Activities*

Figure 2 is a documentation of life skill center activities, which have been carried out by the Makarima Sukoharjo Islamic PAUD institution, cleaning the classroom after playing. Children are taught to clean up their toys and the play area. During this activity, they learn important skills such as cleanliness and responsibility. This activity not only improves the cleanliness of the environment but also builds their sense of responsibility and independence.

b. Preparation Center

This preparation place teaches children to categorize, pattern, and organize materials and tools. This preparation center is specifically designed to give children the opportunity to play. Playing is fun for

children, and of course, children's play requires media or facilities provided by teachers or schools, and it is designed to encourage children's creativity and intuition. The game is played actively in a fun environment with the application of initial rules. The game is played with teacher guidance and according to the developmental stage of the game.

The tools and materials provided by the teacher also help children prepare for reading, writing, and mathematics. Examples of activities in the Preparation Center include helping children add simple numbers, such as 1 plus 1, ordering numbers from largest to smallest, and ordering objects from smallest to largest and vice versa. Another example is that they group objects of the same color or size. The patterns are made through cutting, sewing, and coloring. The rules of the games used in the Preparation Center are: love friends, listen, concentrate, master, use tools according to their function, share, take turns, work in groups, walk, achieve goals, and solve problems by doing something and talking about it.

The benefits of the Preparation Center are: 1) Children can prepare what they need, 2) Children can classify objects in their environment, and 3) Children can organize objects and learn to make connections between objects and learning objects (such as food), 4) Children try to tell stories according to the pictures they see, 5) Children learn to work alone, side by side, together and cooperate (Caliskan, 2016).



Figure 3. *Documentation of Preparation Center Activities*

Figure 3 is documentation of the preparation center activities that the Makarima Sukoharjo Islamic PAUD institution has done. There are several activities, namely the first activity, where the children are asked to take a rubber in a container filled with water by stabbing it. In the second activity, the children group geometric shapes. The teacher conducted the third activity, the children counted using educational game tools (APE), using a cardboard.

c. Sentra Design

The design center learning model is a circular learning model centered on children. Children plan activities and then put them into buildings made of cardboard or blocks according to their wishes. The imagination they express in their designs, while prosocial behavior means helping others without thinking about material or psychological rewards. As we know, the building center is a place to learn to build something with the primary material of blocks. At the same time, this design center is also used to build something with a broader range of basic materials because they cannot be built with just blocks. However, it can use liquid materials, such as Legos and cardboard.

Design centers encourage children to develop peer relationship skills, good communication skills, cooperation, adaptation, and sharing (Hartati & Putri, 2010). The center learning model can stimulate all aspects of child development through directed play. Therefore, as parents/teachers, we should provide social behavior stimulation to children early so they get used to it and become better individuals (Sefriyanti & Diana, 2021).



Figure 4. *Documentation of Design and Construction Center Activities*

Figure 4 is documentation of design center activities, which the Makarima Sukoharjo Islamic PAUD institution has done; several activities were carried out, namely arranging blocks according to their imagination. This design center is almost the same as the block center; the only difference is the primary material. The design center is a learning center where students build something using blocks as the primary material. Meanwhile,

this building is also used to construct the design center, although the primary material is wider because it cannot only use blocks. However, it can use cardboard, Lego, and liquid media.

d. Natural Materials Center

The natural material center is a learning center that uses the five senses directly, training children's motoric, cognitive, social, and emotional skills to make the learning process more effective. The natural material center also supports children's developmental abilities and knowledge when they play with their sensory motor skills by exploring materials from nature. This can also develop fine motor skills, such as training in writing preparation, and stimulating children's thinking systems (Munar et al., 2021).

Natural Material Center tries to help children use various media to enhance their creativity. Alternatively, objects from nature can be found in everyday life. Natural Resource Center activities include development activities using water resources, especially water, sand, grains, flour, etc., and evaluation in proceedings at scientific conferences. Like in the natural material center at the Islamic Makarima PAUD, children make loose parts of face shapes using leaves, grains, flowers, shells, etc. Matching the letters on the leaves and paper, then clipping them with clothespins. In making a rainbow with foam, children prepare aqua bottles that have been cut, then give them a tissue and tie them with rubber, and then the tissue is given food coloring—basic colors such as red, orange, yellow, purple, green, blue, and purple. Next, prepare soapy water, then the bottle given food coloring is dipped in soapy water, then blown, and becomes a rainbow. Children can enjoy the creative process of making a rainbow using soapy water and food coloring (Munar et al., 2021).



Figure 5. *Documentation of Natural Materials Center Activities*

Figure 5 is the design and building central activities documents that PAUD Islam Makarima Sukoharjo has carried out. Like in the natural materials center at the Makarima Sukoharjo Islamic, children make loose parts for facial shapes using leaves, seeds, flowers, shells, etc. Match the letters on the leaves and paper, then pin them with clothespins. In making rainbows with foam, the children prepared cut aqua bottles, which were then given tissue and tied with rubber bands. Then the tissue was given food coloring—basic colors include red, orange, yellow, purple, green, blue, and violet. Next, prepare soapy water, dip the bottle filled with food coloring into the soapy water, and blow on it. A rainbow appears. Children can enjoy the creative process of making a rainbow using soapy water and food coloring.

e. The Role of Siroh Sentra

Using the storytelling method after memorizing *Surah al-Mu'minun* verses 1-11, two stories are told, namely the story of Qarun and Prophet Musa and the story of the goat herder. The story told contains story indicators related to the meaning of *Surah Al-Mu'minun*, so the story told becomes a story from the Qur'an and a story of pious people. After telling the story of the prophet, the children are told to wear costumes like the prophet and retell the story. The teacher will review the material the next day in class so that they can understand it. After the children understand, the teacher replaces the prophet's story with the following story.

In addition, storytelling without props and teachers describes the characters in the story using facial expressions, songs, and mimics. By applying storytelling techniques, several themes will emerge in the story that are in accordance with the meaning of the letter *al-Mu'minun*, such as the themes used in both stories, namely, sacred and moral themes, and settings based on elements of Theater. The story's content refers to place, time, and flow of events. Conflicts arise from the character introduction phase and are used continuously until the resolution phase. Teachers use voice and mimic techniques to describe the characters when telling stories. The benefits of the storytelling method are (1) instilling honesty, courage, loyalty, friendliness, sincerity, and other positive attitudes in the family, school, and outside school environment; (2) providing several social, moral, and religious values; (3) Practicing to become a creative and critical listener (Anggraeni & Miftahillah, 2018).



Figure 6. *Documentation of Activities of the Siroh Role Sentra*

Figure 6 is documentation of *Siroh's* role center activities, which the Makarima Sukoharjo Islamic PAUD institution has carried out. There are several activities carried out, namely, children telling the story of the prophet by wearing costumes according to the story told by the children, and to illustrate the story. With this method, children not only learn about Islamic history in a fun way but also develop a deeper understanding of the role and contribution of the Prophet Muhammad SAW in history.

2. STEAMLY Plus Approach

The learning mode used in the Makarima Sukoharjo Islamic PAUD institution is a center model with a STEAMLY Plus approach. STEAM is a learning mode that encourages children to have critical thinking, communication, creativity, and collaboration skills (Motimona & Maryatun, 2023). The goal of STEAM learning for early childhood is to provide knowledge and experience from fun activities, and social interactions with peers, and adults (Purnamasari et al., 2020). STEAM is an educational approach that integrates the art dimension into STEM (Science, Technology, Engineering, Mathematics).

This approach aims to combine the strengths of creativity and analysis to enhance students' understanding of STEM material and develop skills such as creativity, collaboration, problem-solving, and critical thinking. Integrating the arts into STEAM takes many forms, including visual arts, performing arts, design, and even aspects of the humanities such as history and philosophy. The main goal is to broaden students' perspectives on STEM material, stimulate their creativity, and help them connect technical concepts with practical applications and real-world situations. The STEAM approach is believed to produce more

qualified graduates better prepared to face future challenges in the increasingly complex world of work and modern life.

STEAM learning mode has important benefits in children's knowledge, including, in Science learning, children can observe an object and experiment with objects. Children can learn to understand an object from its function, characteristics, or structure. Second, Early Childhood Technology learning focuses more on using technology equipment so children can train their fine motor skills by typing, writing, or drawing. Third, in AUD Engineering learning, children can practice problem-solving skills. For example, by building a Tower from Popsicle Sticks, children will learn to overcome balance and structure problems. Fourth, in AUD Art learning, more emphasis is placed on fun things or activities such as dancing, drawing, painting, listening to music, etc. Fifth, in AUD Mathematics learning, children can recognize numbers and calculate using their cognitive abilities. (Motimona & Maryatun, 2023). The last one in AUD learning is Literacy, where literacy refers to understanding, combining, analyzing, using, and transforming knowledge, where children can read and write according to the child's language development stage (Yulia et al., 2021).

The STEAMLY Plus approach integrates Science, Technology, Engineering, Art, Mathematics, and Literacy, with "Plus" representing Islamic Religious Education. The religious sector regulates this additional component according to a predetermined schedule and includes teachings on *aqidah* (faith), *fiqh* (Islamic jurisprudence), morals, and *sirah* (prophetic biography). It features stories of the prophets, the Prophet's family, and other Islamic narratives, often accompanied by role-appropriate costumes. The role of *sirah* is a form of role activity that tells stories like the prophets, and fosters the development of religious moral values in children (Wati, 2023). The implementation of the Role of *Siroh* Center at the Makarima Sukoharjo Islamic PAUD institution is carried out by referring to the independent curriculum that is in accordance with the developmental age of each child where each material taught by the teacher is responsible for making plans with the head of the religious curriculum coordinator regarding the learning material that will be taught every two weeks until the

following week until the theme runs out. The role of Siroh at the Makarima Sukoharjo Islamic PAUD institution uses a part model, which is reviewed for one week, with parts such as the Prophet Muhammad as a baby. Then, the second week continues with the second part, when the Prophet Muhammad started trading. In the Makarima Sukoharjo Islamic PAUD institution, a moving class system is implemented where children learn to get to know many teachers in each different center, not only the teachers who teach in their class. STEAMLY Plus means that the activity prioritizes the process rather than the result. Teachers are facilitators who help children think further and solve problems. Activities that develop children's literacy skills. Activities with an Islamic religious approach in all learning processes.

The STEAMLY Plus approach integrates five scientific disciplines, namely Science, Technology, Engineering, Art, and Mathematics, and includes adding Life Skills elements. In the context of central learning, this approach is designed to provide a more holistic learning experience based on problem-solving involving creativity and skills. Central learning is a method that focuses on structured play activities to develop various aspects of children's development, including creativity and motor skills. Each center will be a space to develop students' skills and creativity through various structured activities. Each center will be a space to develop students' skills and creativity through various structured activities.

The STEAM plus approach can significantly impact children's lives, especially developing their cognitive, emotional, social, and spiritual skills. Integrating disciplines (science, technology, engineering, arts, mathematics) with religious, moral, and social values (values that build children's character and morals) helps children not only understand academic concepts but also apply them in their daily lives in meaningful and relevant ways—example of STEAMLY Plus approach: Connecting Knowledge to Real Life. The impact of this approach can integrate STEAM learning with religious and social values to help children see the connection between what they learn in class and their daily lives, where learning about *fiqh* (religious law) can be accompanied by direct applications in life, such as praying before eating (connecting religious values with daily activities). Besides that,

children learn how science and religious teachings work together to give them a deeper understanding of the world around them. For example, children can learn about honesty through the stories of the prophets, then apply it in their daily lives.

D. Conclusion

Implementing STEAMLY Plus in the Center Learning Model has proven to be 70% effective in improving children's holistic skills by strengthening cognitive, social, and emotional aspects, learning interests, and children's participation after participating in learning with the STEAMLY Plus approach. This approach encourages higher learning interests through interactive and collaborative activities, which develop creativity, problem-solving, and cooperation between children. In addition, this program can also integrate aspects of religious education (Plus), successfully instill moral and religious values in learning. The storytelling method in the Siroh Role Center, for example, is effective in teaching Islamic values and fostering religious attitudes.

The STEAMLY Plus approach can improve children's holistic skills. Cognitively, children experience increased critical thinking skills, problem-solving, and creativity through activities that combine science, technology, engineering, art, and mathematics. Children learn to interact, collaborate, and develop empathy regarding social and emotional issues. In addition, it can improve fine and gross motor skills through activities involving art and physical experiments. Teachers can apply STEAMLY Plus by choosing themes appropriate to the student's environment, a project-based approach, and facilitating reflection and discussion after activities. This approach can be applied in class, at home, or online learning (digital and interactive media). The STEAMLY Plus model has great potential to be applied and tested further in PAUD institutions as a fun and meaningful learning innovation for early childhood.

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