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# Assistance in Implementation of Interactive Educational Media Based on Play-Based Learning to Stimulate the Sensorimotor Abilities of Early Childhood Children

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**Abstract :**
This community service activity aimed to assist teachers in implementing interactive educational media based on *Play-Based Learning* to improve the quality of play experiences and stimulate the sensory-motor skills of early childhood learners. The activity was conducted at TK Bina Anaprasa Paiton Probolinggo using a participatory and collaborative approach through the stages of needs identification, planning, capacity building, practice, implementation, monitoring, evaluation, reflection, and follow-up. Data were collected through observation, discussions and informal interviews, documentation, and reflection with teachers, and were analyzed descriptively and qualitatively. The results showed positive changes in teachers' capacity, particularly in connecting children's developmental objectives with the selection and use of educational media. The implementation of interactive educational media encouraged children to become more actively engaged in exploring, trying, repeating, arranging, moving, matching, and grouping objects. These activities stimulated fine motor skills, gross motor skills, hand-eye coordination, balance, and sensory responses. The implications indicate that simple media can serve as an interactive learning environment when designed according to developmental objectives and supported by teachers acting as facilitators and scaffolders. Program sustainability requires the development of diverse media, continuous teacher competency improvement, and integration of these practices into the school's learning system.

## INTRODUCTION

This section of the research contains the background, research problems, summaries of previous relevant studies, the gap of knowledge, novelty, and research objectives. This will reveal the state of the art, its originality, APA style with a single space. Example: (Moleong, 2016; Sheikhalizadeh & Piralaiy, 2017; Levina et al., 2016)

Early childhood education is a fundamental stage in developing human quality because during this period children experience rapid and interconnected development. Education at this stage should not merely be understood as a process of introducing early academic abilities, but rather as a process of providing experiences that enable children to develop cognitive, language, social-emotional, physical-motor, creativity, independence, and environmental interaction skills (Adatul'aisy et al., 2023; Febriantini & Salsabila, 2025). The characteristics of young children, who are active, highly curious, enjoy movement, and learn through concrete experiences, require learning that differs


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from learning at higher educational levels.

In this context, play has a strategic position in early childhood learning. Play provides children with opportunities to explore, try various possibilities, repeat experiences, interact with objects and other people, and construct understanding through action. Therefore, play-based learning should not be positioned as an additional activity after learning has been completed, but rather as a pedagogical approach that can integrate various aspects of children's development (Afwa, 2026; Khoirotin et al., 2025).

Recent literature shows that Play-Based Learning has developed into one of the important approaches in early childhood education. Recent studies indicate that the literature on play-based learning encompasses diverse focuses, developmental outcomes, implementation strategies, and contextual factors that influence its success (Mohammed et al., 2026). Thus, the implementation of Play-Based Learning cannot simply be understood as providing children with playtime; it requires appropriate environmental design, material selection, learning objectives, and teacher interaction.

In practice, there are still issues concerning the interpretation of play-based learning. Research by (Latifah et al., 2025; Rohmadheny et al., 2025) indicates that teachers' experiences in implementing Play-Based Learning need to be considered because inappropriate understanding can cause play practices to lose their pedagogical purpose. This demonstrates that implementation requires teachers' competence in connecting play activities with children's developmental objectives.

Another important aspect is the role of teachers. Play-based learning does not mean that teachers relinquish their pedagogical responsibilities. On the contrary, teachers need to create an environment that allows children to explore while providing support at the appropriate time (Gea & Zega, 2025). Other studies indicate that children's involvement is associated with teacher roles such as observer, play partner, guide, environment manager, and supporter. Strategies include scaffolding, modeling, questioning, giving instructions, and observation (Cheung & Wu, 2026)

This concept is consistent with guided play, in which children continue to have space to play and explore while teachers provide structure or support that directs these experiences toward specific developmental objectives. For example, demonstrates that guided play can integrate curricular objectives with meaningful play experiences without eliminating the characteristics of play (Sanchez, 2025; Basofitrah, et al., 2026).

In addition to the learning approach, educational media are an important element in creating meaningful play experiences. Media can function as objects of exploration, sources of sensory stimulation, means of manipulation, and tools for building interaction. In early childhood education, media do not always have to be technology-based. Blocks, puzzles, cards, natural materials, sensory boards, classification games, and manipulable objects can become interactive media when children are given opportunities to act upon them (Rohmah & Aziz, 2024; Thayyibah & Fitriani, 2025).

The use of interactive educational media has strong relevance to sensorimotor development. Sensorimotor abilities are related to the process by which children receive information through their senses and respond to it through movement (Chahyani & Istiyani, 2025; Mariani et al., 2025). Children see colors and shapes, touch textures, estimate the size or position of objects, and then direct body or hand movements to perform actions. The relationship between sensory input and motor responses occurs

repeatedly during play activities (Rahayu et al., 2025).

Fine motor stimulation can be conducted through activities such as grasping, taking, inserting, moving, arranging, matching, and grouping objects. Gross motor skills can be stimulated through walking, jumping, changing positions, maintaining balance, and regulating body position. In play-based learning, these aspects do not have to be rigidly separated. One activity can simultaneously stimulate fine motor, gross motor, sensory, cognitive, language, and social development.

Local studies also demonstrate the relevance of using media and play activities in early childhood education. For example, developed Playmate Sensory media as a medium for stimulating the senses of young children (Rahmawati et al., 2025). Wulandari demonstrated the importance of sensory-motor stimulation training in community service (Wulandari et al., 2025). These findings provide a basis for strengthening educator capacity alongside the provision of media and implementation strategies.

This community service activity was conducted at TK Bina Anaprasa Nurul Jadid, Paiton, Probolinggo. The institution is committed to creating creative and enjoyable learning. Play activities have been used in the learning process; however, based on observations and discussions with the school, the utilization of interactive educational media was still not optimal. The available media were relatively simple and had not been fully integrated into the learning design.

The first problem identified was the limited variety of interactive educational media implementation in learning activities. This limitation restricted children's opportunities to gain experiences through various textures, shapes, colors, sizes, movements, and object manipulation. The available media tended to be used as teacher aids rather than as environments for children's exploration.

The second problem concerned teacher competence. Teachers already possessed creativity and commitment to innovative learning but still required strengthening in implementing media based on children's developmental objectives. Teachers need to understand that good media should not only be visually appealing but also provide children with opportunities to act, choose, try, repeat, manipulate, and gain sensory and motor experiences (Susanti & Anhar, 2025).

The third problem was the tendency for sensorimotor activities to be monotonous and repetitive. Activities that lack variety can reduce children's engagement. Therefore, variations in media and activities are needed to enable the repetition of skills in different situations.

The fourth problem concerned the fine and gross motor development of some children who still required stimulation. The aspects of concern included hand-movement coordination, the ability to grasp and move objects, hand-eye coordination, body balance, and sensory responses to the environment.

The fifth problem was the absence of continuous assistance specifically designed to help teachers implement interactive educational media based on Play-Based Learning. Previous training was considered insufficient to ensure that knowledge could be applied consistently. Therefore, the activity was designed to include workshops, practice, implementation, monitoring, evaluation, reflection, and follow-up.

Based on these problems, the community service activity was designed not only to provide training but also to establish a process of joint learning between the service team and the partner institution. Teachers were positioned as collaborative partners

involved in needs identification, media implementation, evaluation, and the development of program sustainability.

This approach is important because the success of community service activities cannot be measured merely by the number of media available. Media can lose their benefits if teachers are unable to use them pedagogically. Conversely, simple media can provide substantial benefits when teachers understand their intended purpose and provide children with opportunities to explore.

The objectives of this community service activity were: (1) to assist teachers in implementing Play-Based Learning; (2) to improve teachers' competence in implementing interactive educational media; (3) to enrich play experiences that provide sensorimotor stimulation; and (4) to increase children's engagement in learning activities.

The contribution of this article lies in presenting a community service experience that integrates two components simultaneously: strengthening teacher capacity and assisting in the direct implementation of interactive educational media in the classroom. Thus, the article not only reports the products of the activity but also analyzes changes in learning practices that occurred during the assistance process.

## RESEARCH METHOD

This community service activity employed a participatory and collaborative approach. This approach was selected because the problems faced by the partner were directly related to everyday learning practices, meaning that solutions needed to be developed based on the school's actual conditions. The service team did not position teachers as objects receiving the program but as partners who possessed experience, practical knowledge, and the capacity to develop solutions.

The activity model followed a cycle of needs identification, planning, capacity building, practice, implementation, evaluation, reflection, and follow-up. This model enabled the community service process to take place as a process of joint learning.

The mentoring approach was selected because changing practices requires more than knowledge transfer alone. Arifin emphasized the importance of mentoring in helping teachers optimize the use of learning media (Arifin et al., 2022). In this context, mentoring served as a bridge between conceptual knowledge acquired through training and actual classroom practice.

This community service activity was conducted at TK Bina Anaprasa Paiton Probolinggo. The partners consisted of the principal and kindergarten teachers, while students were the primary targets of media implementation.

Partner involvement began from the initial stage. The principal played a role in coordination and institutional support, while teachers were the main participants in the training and implementers of the activities. Students participated in play activities designed using interactive educational media.

Data were obtained through four main techniques. Observation was conducted during the learning process to examine media use, teacher-child interaction, and children's engagement. Discussions and informal interviews with the principal and teachers were used to obtain information regarding needs, experiences, obstacles, and perceptions of media implementation. Documentation was used to record training, workshops, implementation activities, and the media produced. Reflection was conducted together with teachers to assess implementation experiences and determine

follow-up actions.

The analysis was conducted descriptively and qualitatively. The interpretation of results was carried out by comparing the initial conditions identified through observation with conditions during and after implementation. The analysis was not intended to calculate statistical effect sizes because the activity did not employ an experimental design and did not provide quantitative pre-test and post-test data. Therefore, the term improvement refers to changes observed in learning practices, children's engagement, and teacher capacity during the program.

## RESULT AND DISCUSSION

### Result

#### Increased Teacher Capacity

The mentoring activity for the implementation of interactive educational media received a positive response from teachers. Teachers began to identify the relationship between the type of media and the developmental aspects to be stimulated.

The important change was not merely an increase in knowledge about Play-Based Learning but also a change in the way teachers thought about learning planning. Before mentoring, media use tended to start from the media already available and was relatively monotonous. After mentoring, teachers were directed to determine developmental objectives first and then select or design appropriate models for media implementation (Ar et al., 2024). Thus, teacher capacity developed from the skill of using media toward the ability to select media based on their pedagogical functions.

Teachers also gained an understanding that media do not have to be expensive or technology-based. Simple materials can become interactive media when they provide children with opportunities to engage directly in activities.

#### Media Implementation in Learning

The implementation stage demonstrated that media could be directly used in learning activities. Teachers applied play activities using media according to the learning themes. During implementation, children appeared to be more active in exploring, demonstrated curiosity, and interacted with the media individually and in groups. Children had opportunities to touch the media, try, repeat, and interact with peers. These findings indicate that media interactivity is primarily determined by the quality of children's activities. Simple media can become interactive when children are given opportunities to take action (Ningsih & Rohita, 2024).

When using blocks, children picked up, selected, arranged, changed positions, and tried again when the arrangement was not appropriate. When using puzzles, children observed shapes, determined positions, attempted to insert pieces, and made corrections. These activities provided both motor and cognitive experiences.

#### Motor Stimulation

Manipulative activities provided stimulation for fine motor skills. Children grasped, picked up, moved, arranged, matched, and grouped objects. Hand-eye coordination was also part of this process. Children needed to observe objects, estimate their positions, direct their hands, and then make adjustments when the results were not appropriate.

Repeated activities provided children with opportunities to improve their movements. This indicates that fine motor stimulation can occur naturally through play without always having to be specifically designed as motor exercises.

Balance-course activities and movement games provided children with opportunities to change positions, maintain balance, and regulate their bodies. Learning that incorporates movement activities becomes more dynamic because children do not merely perform activities while seated. These activities also demonstrate that gross motor skills can be integrated with other learning objectives.

**Increased Child Engagement**

During implementation, increased child engagement was observed. Children demonstrated curiosity, courage to try, and a desire to repeat activities. Engagement also emerged in the form of social interaction. Children observed their peers, shared objects, discussed, and attempted activities together.

These conditions demonstrate that interactive educational media have cross-domain potential. Although the primary objective was sensorimotor stimulation, play activities also created opportunities for social development, communication, creativity, and problem-solving.

**Transformation of the Teacher's Role**

One important finding was a change in the teacher's position in learning. Teachers were encouraged not always to become the center of information. Teachers provided initial instructions, established objectives, and then gave children space to explore. Teachers acted as facilitators and scaffolders. They observed children's activities, asked questions, provided stimuli, and assisted when children experienced difficulties.

These findings are consistent with research on the teacher's role in PBL, which demonstrates the importance of scaffolding, modeling, questioning, observation, and management of the play environment in maintaining children's engagement (Cheung & Wu, 2026).

**Changes in the Learning Atmosphere**

Before mentoring, sensorimotor activities were identified as tending to be monotonous. After media were used in a more integrated manner, the learning atmosphere became more varied and enjoyable. Children had opportunities to move from one activity to another. Activities could be conducted individually or in groups.

Teachers also gained more alternatives for designing learning. Thus, media functioned not only as stimulation tools but also as organizers of learning activities.

**Program Sustainability**

Joint reflection with the school resulted in a commitment to continue using interactive educational media. The school was also encouraged to develop a learning-media bank so that the products created could be documented and utilized sustainably. Planned follow-up activities included developing media variations, improving teacher competence, evaluating sensorimotor development, providing planning time, and preparing guidelines for media use.

Sustainability is important because changes in learning practices cannot be guaranteed through training activities alone. The program needs to become part of the

school's system.

## Discussion

### Media as a Learning Environment, Not Merely a Teaching Aid

The activity findings demonstrate a fundamental change in the way teachers viewed media. Initially, media were primarily positioned as teaching aids. After mentoring, media began to be understood as environments that enabled children to engage in activities.

This change has pedagogical implications. When media are positioned as teacher aids, the center of activity remains with the teacher. The teacher explains and demonstrates, and then the children follow. Conversely, when media are positioned as environments for exploration, children gain opportunities to take initiative.

In the context of Play-Based Learning, this shift is important because play-based learning requires a balance between pedagogical objectives and children's agency. The implementation of Play-Based Learning needs to be understood comprehensively because its effectiveness is influenced by various factors, including activity design and the educator's role (Kristiana, 2025).

Blocks are a simple example. Blocks can be used in various ways. Teachers do not need to provide a single final form that children must imitate. Children can determine the form of the structure themselves, test its stability, and modify the construction.

Thus, the value of media lies in the affordances, or opportunities for action, that they provide to children. The greater the number of meaningful possible actions, the greater the potential for media to become part of play-based learning.

### Play-Based Learning as a Bridge between Play and Developmental Objectives

One issue in early childhood education is the tendency to separate play and learning. Play is regarded as a free activity, whereas learning is considered an activity directed by teachers. The Play-Based Learning approach reduces this dichotomy. Play continues to provide space for exploration, but activities are designed within an environment rich in stimuli.

The mentoring results demonstrate that teachers began connecting developmental objectives with play activities. For example, the objective of hand-eye coordination was translated into activities involving matching or moving objects. The objective of balance was translated into movement courses.

This finding is consistent with the concept of guided play, an approach that allows learning objectives to meet the characteristics of active and meaningful play (Sanchez, 2025). Thus, PBL does not mean eliminating teacher intentionality. On the contrary, intentionality is necessary so that play activities provide relevant developmental experiences.

### The Importance of Teacher Scaffolding

The change in the teacher's role was one of the most important outcomes. Teachers were no longer merely providers of instructions but became facilitators and scaffolders. In play-based learning, scaffolding can be provided through simple questions, examples, choices, reinforcement, or assistance when children experience difficulties.

For example, when a child has difficulty assembling a puzzle, the teacher does

not immediately insert the piece. The teacher can provide questions or clues that help the child observe the shape. Thus, the child remains the primary actor. Research by (Cheung & Wu, 2026) demonstrates the importance of teachers' roles and strategies in children's engagement in PBL. Strategies such as scaffolding, discussion, modeling, playing together, and observation form part of pedagogical interactions that support children's engagement.

The findings reinforce the argument that the success of media depends greatly on how teachers use them. Good media do not automatically produce good learning when teachers remain overly dominant.

**Child Engagement as a Process Indicator**

Increased child engagement was an important finding of the activity. Children became more active in exploring, trying, and repeating activities. Engagement is not merely an indicator of children's comfort but also creates more learning opportunities. Children who actively perform actions have greater opportunities to obtain sensory and motor experiences.

Research on Play-Based Learning in Indonesia also indicates that play experiences can serve as a means of stimulating various aspects of development holistically (Amir et al., 2024). However, engagement should not simply be understood as children appearing happy. In the context of Play-Based Learning evaluation, engagement needs to be analyzed based on attention duration, initiative, exploration, interaction, persistence, and responses to challenges.

This community service activity did not use quantitative instruments to measure these indicators in a standardized manner. Therefore, the findings regarding engagement should be understood as the results of descriptive observation.

**Simple Media as a Contextual Strategy**

One important finding was that learning innovation does not have to depend on digital technology. Simple media can be used effectively when they are appropriate to developmental objectives. This is important in the context of schools with limited resources. Developing media using simple materials makes innovation easier to replicate (Sulistiyono et al., 2025). This strategy can also improve sustainability because teachers do not depend on products that can only be purchased. Teachers can create or modify media according to their needs.

In the context of community service, sustainability is important. Solutions that are too expensive have the potential to stop after the project is completed. Conversely, simple media that can be produced by teachers have a greater chance of being sustained.

**Teacher Competence Development as the Core of the Program**

This activity demonstrates that media products are not the only important outputs. Teacher competence is a determining factor in sustainability. Teachers who understand the principles of media can continue creating new media even when the initial media are damaged or no longer appropriate for the learning theme. Conversely, if teachers only receive finished products, innovation may stop when the products are no longer available. Therefore, the workshop in this activity had greater value than simply providing media directly. Teachers experienced the process of designing, selecting materials, and determining the functions of the media.

This is consistent with the mentoring approach that positions teachers as agents of change. Arifin demonstrate that mentoring can be a strategy to help teachers optimize the utilization of learning media (Arifin et al., 2022)

## CONCLUSION

Assistance in implementing interactive educational media based on Play-Based Learning at TK Bina Anaprasa Paiton Probolinggo made a positive contribution to strengthening teacher competence and developing children's learning experiences. The assistance, conducted through observation, socialization, training, workshops, implementation, monitoring, evaluation, and reflection, successfully shifted the orientation of media use from merely serving as teaching aids toward functioning as environments for children's exploration. Teachers gained a better understanding of the relationship between developmental objectives, play activities, and the pedagogical functions of media.

Media implementation demonstrated that children became more active in exploring, trying, repeating, arranging, moving, matching, and grouping objects. These activities stimulated fine motor skills, gross motor skills, hand-eye coordination, balance, and sensory responses. In addition, play-based learning also created opportunities for the development of creativity, communication, social interaction, and simple problem-solving.

Another important finding was the transformation of the teacher's role. Teachers began to act as facilitators and scaffolders by providing children with space to explore while maintaining pedagogical intentionality.

The activity also demonstrated that innovation in early childhood learning does not have to depend on digital media or expensive materials. Simple media can have strong pedagogical functions when designed based on developmental objectives and used through appropriate interaction.

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## ETHICS STATEMENT

This study was conducted in accordance with established ethical principles for research involving human participants. Prior to data collection, all participants were

informed about the objectives of the study, the voluntary nature of their participation, and the confidentiality of their responses. Written informed consent was obtained from all respondents before they completed the questionnaire. The study did not involve any medical intervention, vulnerable populations, or sensitive personal data; therefore, formal Institutional Review Board (IRB) approval was not required under the institutional guidelines applicable to this research.

## DECLARATION OF GENERATIVE AI USE

This research received no external funding. All research activities, including data collection, analysis, and manuscript preparation, were supported independently by the authors.

## DATA AVAILABILITY STATEMENT

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request. The data are not publicly available because they contain information that could compromise the privacy of the research participants.

## CONFLICT OF INTEREST

The authors declare that there are no financial, professional, or personal conflicts of interest that could have influenced the research, authorship, or publication of this article.

## AUTHOR CONTRIBUTION STATEMENT

All authors have made substantial contributions to the conceptualization of ideas, implementation of research, data analysis, and preparation and refinement of the final manuscript of this article.

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