



## Developing Big Puzzle Learning Media to Enhance Cooperation Skills in Early Childhood

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### ABSTRACT

The development of social-emotional competencies, particularly cooperation skills, is a crucial aspect of early childhood education as it supports children's ability to interact effectively, share responsibilities, and engage in group activities. However, limited use of innovative and engaging learning media often hinders the optimal development of these skills. This study aims to develop Big Puzzle learning media and examine its effectiveness, validity, and practicality in improving the cooperation skills of children aged 5–6 years. This research employed a Research and Development (R&D) approach. Data were collected through interviews, observations, and questionnaires. The findings reveal that the design process of the Big Puzzle learning media includes the development of both the puzzle product and a supporting guidebook. The effectiveness of the media was categorized as very effective, with a score of 3.4. Furthermore, the level of development in enhancing children's cooperation skills obtained a score of 3.5, indicating an improvement category. In terms of product quality, the Big Puzzle learning media achieved a very valid classification based on expert validation results. Additionally, the practicality level reached a score of 3.4, which falls into the practical and highly practical category for classroom use. These results indicate that the developed Big Puzzle learning media is valid, practical, and effective in enhancing the cooperation skills of children aged 5–6 years. Therefore, this media can be utilized as an alternative learning tool to support the development of social interaction and collaborative abilities in early childhood education.

**Keywords:** *Big Puzzle Learning Media, Cooperation Skills, Early Childhood, Learning Media*

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## INTRODUCTION

Education plays a fundamental role in guiding children's development toward achieving their full potential as individuals and members of society (Amalina et al., 2025; Novia Maulana et al., 2025; Warmansyah et al., 2023). The philosophical foundation of education emphasizes that learning is not merely the transfer of knowledge but a process of nurturing all aspects of human potential, including cognitive, social, emotional, and moral dimensions (Syarfina & Warmansyah, 2025; Wulandari et al., 2025). In the context of early childhood education, this perspective becomes increasingly important, as early childhood represents a critical period in which rapid growth and development occur across multiple domains (Andina et al., 2025b; Elsayed, 2024; Puji & Hakobyan, 2025). During this stage,

children require appropriate stimulation and meaningful learning experiences to support their holistic development.

Early childhood, generally defined as the age range from birth to eight years, is widely recognized as the “golden age” of development, where children are highly responsive to environmental influences and learning stimuli (Azzahra et al., 2023; Saleha et al., 2022). At this stage, children begin to develop fundamental social competencies through interaction with peers and adults (Rusady et al., 2025; Wita & Villanueva, 2025; Yulia et al., 2025). The quality of these early experiences significantly shapes their future behavior, personality, and ability to adapt to social environments (Justice et al., 2017; Pujoko et al., 2025). Theoretical perspectives, such as those proposed by Locke, emphasize that children’s development is strongly influenced by environmental experiences, highlighting the importance of providing appropriate learning conditions that foster positive social behaviors (Ellis et al., 2024; Oldham, 2024).

One of the essential aspects of early childhood development is social–emotional competence, particularly cooperation skills. Cooperation is defined as a form of social interaction in which individuals work together to achieve shared goals through coordinated efforts (Lin et al., 2024; Locke et al., 2022). In early childhood settings, cooperation involves children’s ability to engage in group activities, share responsibilities, communicate effectively, and respect others’ perspectives (Harjanty & Muzdalifah, 2022). These skills are crucial in fostering positive peer relationships and preparing children for more complex social interactions in later stages of life (Garaigordobil et al., 2022; Gülseven et al., 2023).

The importance of cooperation skills is also reflected in early childhood education standards, which emphasize the development of prosocial behavior, including the ability to collaborate, share, and interact positively with peers (Hikmah et al., 2024; Polat et al., 2022). Children who demonstrate strong cooperation skills tend to participate more actively in group activities, show empathy, and develop a sense of responsibility toward others (Khatijah et al., 2025). Conversely, children with limited cooperation skills often experience difficulties in social interaction, such as conflicts with peers, lack of communication, and tendencies toward individualistic or antisocial behavior (Salum et al., 2024).

Empirical observations in early childhood learning environments indicate that cooperation skills among children are not always optimally developed. Several behavioral patterns can be identified, including children’s reluctance to interact with peers, limited communication during group activities, conflicts over the use of learning materials, and passive participation in collaborative tasks. These conditions suggest that traditional learning approaches may not sufficiently support the development of cooperation skills, thereby necessitating the use of more interactive and engaging instructional strategies.

Learning media plays a crucial role in facilitating effective learning experiences in early childhood education. Media serves as a tool that bridges communication between educators and learners, enabling the delivery of learning content in a more engaging and meaningful manner (Andika et al., 2025; Andina et al., 2025a; Haniya et al., 2025; Syaharra et al., 2025). The use of appropriate learning media can enhance children’s attention, motivation, and understanding, while also providing opportunities for active participation and interaction (Aini & Dwi Cahyo, 2024; Anastasya et al., 2025). Therefore, selecting and developing

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innovative learning media is essential to address the challenges in fostering cooperation skills among young children.

Play-based learning media, particularly those that involve collaborative activities, have been shown to be effective in promoting social interaction and cooperation among children (Aranda et al., 2022; Ganatsios et al., 2021; Ndlovu et al., 2023; Pyle et al., 2023). One type of media that has strong potential in this regard is puzzle-based learning media. Puzzle activities encourage children to think critically, solve problems, and engage in cooperative interactions with peers (Mubaroroh et al., 2023; Xin et al., 2026). In addition, puzzles with attractive designs, colors, and forms can increase children's interest and motivation to participate in learning activities (Mubaroroh et al., 2023; Wang et al., 2023; Wati Fajzrina et al., 2024).

Big Puzzle learning media is an innovative form of puzzle designed with larger dimensions and more complex components, requiring children to work together in order to complete the task (Lane & Xavier, 2024; Virawanti & Sugiarto, 2022). This characteristic makes Big Puzzle particularly suitable for fostering cooperation skills, as children need to communicate, share roles, and coordinate their actions during the activity. Furthermore, Big Puzzle not only supports social development but also enhances cognitive abilities, memory, and fine motor skills.

Previous studies have demonstrated the effectiveness of puzzle-based activities in improving cooperation skills among young children (Inkasari et al., 2024; Lane & Xavier, 2024). Research shows that children who engage in puzzle-solving activities in group settings exhibit increased interaction, better communication, and stronger collaborative behavior (Aliyudin & Alvionita, 2025; Farida et al., 2022; Mulyana & Nurcahyani, 2022; Wang et al., 2023). Additionally, the development of Big Puzzle media has been found to provide opportunities for children to work together, share ideas, and complete tasks collaboratively, thereby strengthening their cooperation skills (Sintia, 2020).

Despite the growing body of research on puzzle-based learning, there remains a need to develop learning media that are specifically designed to address cooperation skills through structured and validated approaches. Many existing learning tools have not been systematically developed and tested in terms of validity, practicality, and effectiveness, particularly in early childhood education settings. This indicates a gap in the availability of well-designed instructional media that can effectively support the development of cooperation skills.

Based on these considerations, this study focuses on developing Big Puzzle learning media as an innovative instructional tool to enhance cooperation skills in children aged 5–6 years. The development process emphasizes not only the design of engaging and child-friendly media but also the evaluation of its quality through validity, practicality, and effectiveness assessments. By integrating play-based learning with structured media development, this study aims to contribute to the improvement of learning practices in early childhood education.

Accordingly, the objective of this study is to develop Big Puzzle learning media and to examine its validity, practicality, and effectiveness in enhancing the cooperation skills of children aged 5–6 years. The findings of this study are expected to provide both theoretical

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and practical contributions to the field of early childhood education, particularly in the development of innovative learning media that support social–emotional competencies.

## **RESEARCH METHODOLOGY**

### **Research Design**

This study employed a Research and Development (R&D) approach aimed at developing and evaluating Big Puzzle learning media to enhance cooperation skills in children aged 5–6 years. The R&D approach was selected as it enables systematic product development followed by validation and testing to ensure the feasibility, practicality, and effectiveness of the developed learning media. This study focused on producing an educational product and examining its quality through empirical testing in a real classroom context.

### **Research Setting and Subjects**

The study was conducted during the even semester of the 2024–2025 academic year in an early childhood education institution. The subjects of the study consisted of children aged 5–6 years and teachers who were directly involved in the implementation of the learning process. Children were selected as primary subjects to measure the improvement of cooperation skills, while teachers acted as facilitators and evaluators during the implementation of the Big Puzzle learning media.

### **Development Procedure**

The development of Big Puzzle learning media followed a systematic four-stage procedure, consisting of define, design, develop, and disseminate.

#### **Define Stage**

This stage aimed to identify and analyze the needs related to the development of learning media. Data were collected through classroom observations and interviews with teachers. The analysis focused on identifying problems in children’s cooperation skills, such as limited interaction, lack of communication, conflicts during group activities, and low participation in collaborative tasks. In addition, curriculum analysis was conducted to align the media with developmental indicators of cooperation skills in early childhood education.

#### **Design Stage**

In this stage, the Big Puzzle learning media was designed based on the results of the needs analysis. The design process included determining the concept, selecting images, defining the size and number of puzzle pieces, and choosing appropriate materials. The product was developed in the form of a large jigsaw puzzle consisting of approximately 20 pieces, with each piece measuring around 30 × 30 cm. The design aimed to encourage group collaboration by requiring children to work together to complete the puzzle. A guidebook was also developed to assist teachers in implementing the media effectively during learning activities.

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### **Develop Stage**

The development stage involved producing the Big Puzzle learning media according to the initial design. The product was then validated by experts, including media experts and educational practitioners, to assess its validity in terms of content, design, and usability. Based on the validation results, revisions were made to improve the product. After revision, a limited trial was conducted to evaluate the practicality and effectiveness of the media in enhancing children's cooperation skills.

### **Disseminate Stage**

The final stage involved implementing the developed media in classroom learning activities on a limited scale. The media was introduced to teachers and used in group-based learning activities. Feedback from teachers and observations of children's responses were collected to assess the usability and impact of the media in real learning situations.

### **Data Collection Techniques**

Data in this study were collected using three main techniques: observation, interviews, and questionnaires. Observation was conducted to assess children's cooperation skills during the implementation of Big Puzzle learning activities. Indicators observed included children's ability to interact, communicate, share tasks, and work collaboratively within groups. Interviews were conducted with teachers to obtain information regarding classroom conditions, challenges in developing cooperation skills, and responses to the use of the developed media. Questionnaires were distributed to experts and practitioners to evaluate the validity and practicality of the Big Puzzle learning media. The instruments used in this study included: 1) Observation sheets to measure children's cooperation skills; 2) Interview guidelines for teachers 3) Validation sheets for experts (media and content experts) ; 4) Practicality questionnaires for teachers. These instruments were designed to assess the quality of the product in terms of validity, practicality, and effectiveness.

### **Data Analysis Techniques**

The data analysis technique used in this study was descriptive quantitative analysis. Data obtained from validation, practicality, and effectiveness assessments were converted into numerical scores and categorized into qualitative criteria such as very valid, practical, and effective. The criteria for evaluating the developed product are presented in the following table:

**Table 1. Criteria for Product Evaluation**

<b>Score Range</b>	<b>Category</b>
3.25 – 4.00	Very Valid / Very Practical / Very Effective
2.50 – 3.24	Valid / Practical / Effective
1.75 – 2.49	Less Valid / Less Practical / Less Effective
1.00 – 1.74	Not Valid / Not Practical / Not Effective

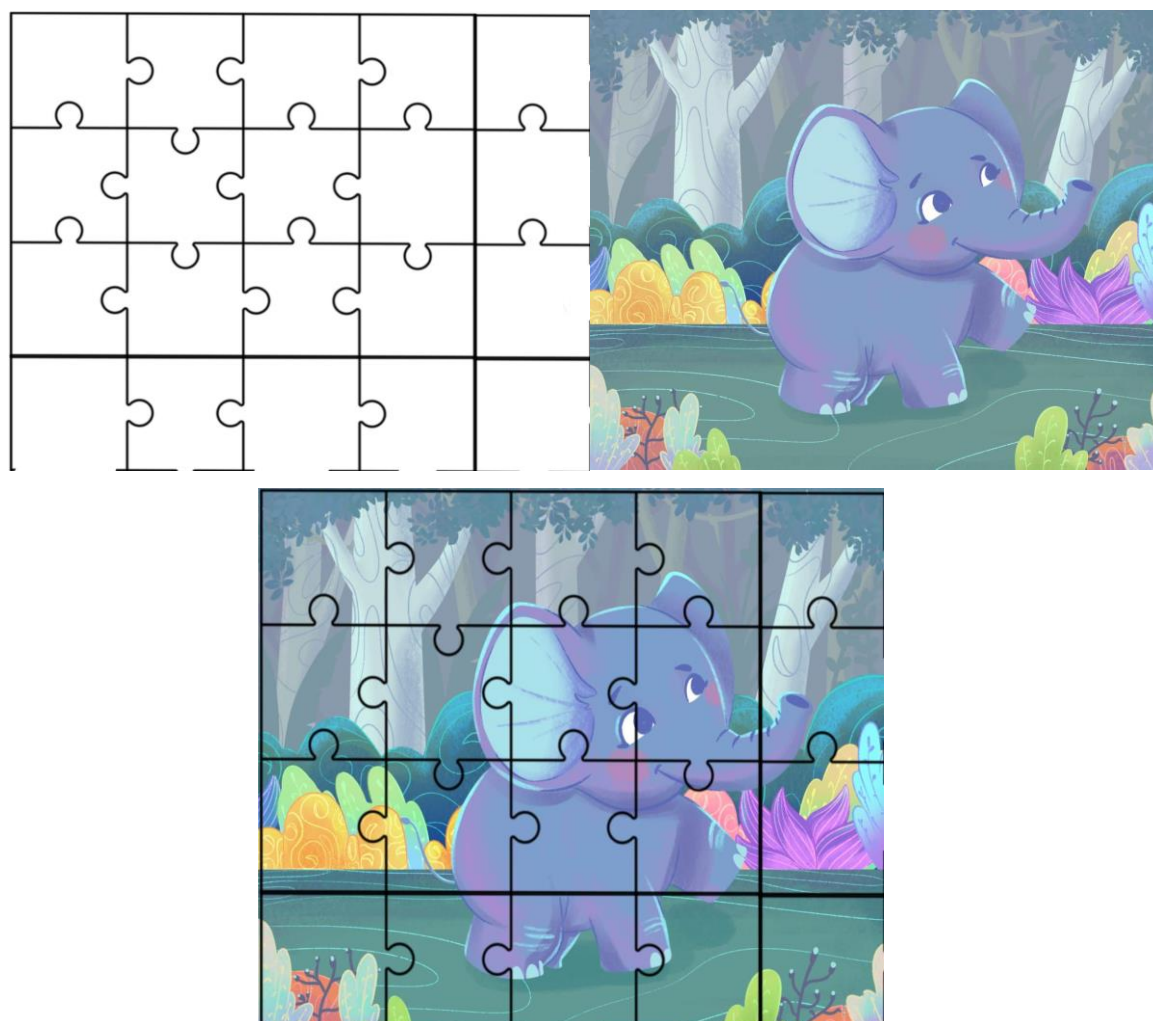
The effectiveness of the Big Puzzle learning media was determined based on the improvement of children's cooperation skills observed during implementation. The validity was determined through expert judgment, while practicality was assessed based on teacher responses during the use of the media.

## **RESULTS AND DISCUSSION**

### **Results**

The development of Big Puzzle learning media was carried out through a systematic Research and Development process aimed at producing a valid, practical, and effective instructional media to enhance cooperation skills in children aged 5–6 years. The results are presented based on product design, validation, practicality, and effectiveness.

At the design stage, the Big Puzzle learning media was developed in the form of a large-sized jigsaw puzzle consisting of 20 pieces, with each piece measuring approximately 30 × 30 cm. The puzzle was made from cardboard materials and designed using attractive and colorful images to stimulate children's interest. In addition to the puzzle product, a guidebook was also developed to support teachers in implementing the media effectively in classroom activities.



**Figure 1. Design of Big Puzzle Learning Media**

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Figure 1 illustrates the physical form of the developed Big Puzzle learning media. The large size of each piece allows children to manipulate the puzzle easily while encouraging group interaction. The visual design emphasizes attractive colors and familiar themes to increase engagement and motivation. The size and number of pieces were intentionally designed to require collaboration among children, thereby supporting the development of cooperation skills. Following the design stage, the product was validated by experts to determine its feasibility. The validation results indicate that the Big Puzzle learning media achieved a very valid category.

**Table 1. Validation Results of Big Puzzle Learning Media**

<b>Aspect Evaluated</b>	<b>Score</b>	<b>Category</b>
Content Validity	3.4	Very Valid
Design Validity	3.5	Very Valid
Average Score	3.4	Very Valid

The validation results demonstrate that the developed media meets the required standards in terms of content and design, making it suitable for implementation in early childhood learning environments. After validation, the practicality of the media was assessed through teacher responses during classroom implementation. Teachers reported that the Big Puzzle learning media was easy to use and supported interactive learning.



**Figure 2. Implementation of Big Puzzle Learning Media in Classroom Activities**

Figure 2 shows the implementation of the Big Puzzle learning media during classroom activities. Children are seen working collaboratively, communicating with peers, and sharing roles in completing the puzzle. This learning situation reflects the intended use of the media as a tool to facilitate cooperative learning.

**Table 2. Practicality Results of Big Puzzle Learning Media**

Aspect Evaluated	Score	Category
Ease of Use	3.4	Practical
Implementation Ease	3.4	Practical
Average Score	3.4	Very Practical

The practicality results indicate that the media is highly applicable and can be implemented effectively by teachers in classroom settings.

Furthermore, the effectiveness of the Big Puzzle learning media was evaluated based on children's cooperation skills during learning activities.

**Table 3. Effectiveness Results of Big Puzzle Learning Media**

Indicator of Cooperation Skills	Score	Category
Interaction with Peers	3.4	Very Effective
Communication	3.4	Very Effective
Group Participation	3.4	Very Effective
Average Score	3.4	Very Effective

The results indicate that children showed significant improvement in cooperation skills, including increased interaction, better communication, and active participation in group tasks. In addition, the level of development in improving cooperation skills obtained a score of 3.5, categorized as "improved," indicating that the media has a positive impact on children's social-emotional development.

## **Discussion**

The findings of this study demonstrate that the developed Big Puzzle learning media is valid, practical, and effective in enhancing cooperation skills in children aged 5–6 years. These results confirm that play-based learning media, when systematically designed, can significantly contribute to children's social-emotional development, particularly in fostering cooperative behavior.

The high validity of the Big Puzzle learning media indicates that the product has met the required standards in terms of content, design, and usability. This finding aligns with the concept that effective learning media must be relevant to developmental characteristics and learning objectives in early childhood education (Hasan, 2020). The integration of attractive visual elements, appropriate size, and meaningful content supports children's engagement and facilitates active learning processes. Furthermore, media serves as a bridge between teachers and learners, enabling more effective delivery of learning experiences (Ilyas, et al., 2021).

The practicality results show that the Big Puzzle learning media is easy to use and can be implemented effectively in classroom settings. This suggests that teachers can integrate the media into learning activities without significant difficulty. The findings support the view that learning media should be designed not only for learners but also for ease of use by educators, thereby enhancing instructional efficiency and classroom interaction (Alotaibi, 2023; Rulismi,

2023; Wang et al., 2023). The presence of a guidebook further strengthens the practicality of the product by providing clear instructions for implementation.

The effectiveness of the Big Puzzle learning media is reflected in the improvement of children's cooperation skills, including increased interaction, communication, and participation in group activities. These findings are consistent with the theoretical perspective that cooperation is a form of social interaction involving coordinated efforts to achieve shared goals (Tjosvold, 1984). Through the use of Big Puzzle, children are encouraged to work collaboratively, share responsibilities, and communicate with peers, which are essential components of cooperative behavior.

In addition, the results of this study are in line with previous research indicating that puzzle-based learning activities can improve children's cooperation skills. Recent Studies show that puzzle games promote interaction and collaboration among children (Chau et al., 2026; Mubaroroh et al., 2023; Xin et al., 2026). Similarly, Sintia (Sintia, 2020) highlights that Big Puzzle media can stimulate cooperation by requiring children to work together in completing tasks. The present study strengthens these findings by providing empirical evidence through a structured development process.

The improvement in children's cooperation skills observed in this study also supports the importance of interactive and collaborative learning environments in early childhood education. Children who engage in cooperative activities tend to develop better social relationships, communication skills, and a sense of responsibility toward others (Daroglou et al., 2026; Ferguson-Patrick, 2026). Conversely, limited opportunities for collaboration may lead to social difficulties, such as conflicts and lack of interaction, as identified in the initial observations of this study.

Despite the positive findings, this study has certain limitations. The implementation of the Big Puzzle learning media was conducted on a limited scale, which may affect the generalizability of the results. In addition, the study focused primarily on cooperation skills without exploring other potential developmental aspects such as cognitive or language skills. Therefore, future research is recommended to involve larger samples and examine the broader impact of Big Puzzle learning media on various domains of child development.

## **CONCLUSION**

This study confirms that Big Puzzle learning media is an effective instructional tool for enhancing cooperation skills in children aged 5–6 years. The developed media meets the criteria of validity, practicality, and effectiveness, indicating that it is suitable for use in early childhood learning environments. The implementation of the Big Puzzle learning media successfully promotes children's interaction, communication, and participation in group activities, which are essential components of cooperation skills. The findings highlight the importance of integrating play-based and collaborative learning media into early childhood education to support social–emotional development. The Big Puzzle learning media provides meaningful learning experiences that encourage children to work together and engage actively in the learning process. Therefore, this media can be used as an alternative learning tool for teachers to foster cooperation skills in early childhood settings.

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