
Community Empowerment Through the Development of Interactive Pop-Up Book Media as a Creative Learning Tool for Early Childhood Education

Zhilli Izzadati Khairuni^{1*}, Siti Zulfa Yuzni¹, Liana Atika², Wahyu Hutria², Mita Dwi Putri¹, Mirzal Yacub¹, Ahmad Zulfikar¹, Khairunnisak¹, and Wisnu Prayogo³

¹ Architecture Study Program, Universitas Negeri Medan, Indonesia

² Building Engineering Education Study Program, Universitas Negeri Medan, Indonesia

³ Environmental Engineering Study Program, Universitas Negeri Medan, Indonesia

*zhilli_ft@unimed.ac.id

Received
20/05/2026

Accepted
27/07/2026

Published
31/07/2026

DOI
[10.59329/carmin.v6i1/311](https://doi.org/10.59329/carmin.v6i1/311)

ABSTRACT

Community empowerment through creative education can strengthen teachers' capacity to independently develop contextual and accessible learning media, particularly for early childhood settings where engaging, hands-on resources are essential. This community service program aimed to develop and implement interactive pop-up books as creative learning tools while strengthening teachers' capacity to design, produce, and utilize visual learning media for early childhood education. The program was conducted at RA Nadhira Asy Syafa, Deli Serdang Regency, Indonesia, employing participatory, educational, and practical approaches. Teachers were actively involved throughout the process, including problem identification, theme selection, media design, production, classroom implementation, and evaluation, ensuring that the resulting media reflected both pedagogical needs and local context. Data were collected through observation, interviews, discussions, documentation, and a simple response questionnaire structured around four indicators: student engagement, early reading responses, creativity, and perceived support of pop-up books for learning. The findings revealed generally positive responses to the developed media. Specifically, 66.7% of respondents agreed or strongly agreed that the media supported student engagement and early reading responses, while 91.7% reported positive perceptions of children's creativity, and 91.7% agreed or strongly agreed that the pop-up books effectively supported learning activities. Nevertheless, variations in children's responses suggest that continued teacher guidance and adaptation to individual developmental needs remain necessary for optimal outcomes. Overall, the program demonstrates that collaboratively developed pop-up books can serve as accessible, low-cost, and context-sensitive learning media, while simultaneously strengthening teachers' practical capacity to independently design and produce creative educational materials suited to their classroom needs.

Keywords: community empowerment, creative learning, early childhood education, interactive visual media, pop-up book, teacher capacity

How to cite:

Khairuni, Z. I., Yuzni, S. Z., Atika, L., Hutria, W., Putri, M. D., Yacub, M., Zulfikar, A., Khairunnisak, Prayogo, W. (2026). Community Empowerment Through the Development of Interactive Pop-Up Book Media as a Creative Learning Tool for Early Childhood Education. *Carmin: Journal of Community Service*, 6(1), 175-190



INTRODUCTION

Education has become a fundamental need for every human being. It can be obtained through various educational institutions, including schools and other forms of formal or non-formal education. Learning activities in each school or educational institution possess distinct characteristics that support the improvement of students' learning abilities and motivation. The local community involved in this empowerment activity is a school, namely RA Nadhira Asy Syafa, an educational institution located in Perumahan Pondok Nusantara, Marendal II Village, Patumbak District, Deli Serdang Regency, North Sumatra Province, Indonesia (Figure 1).

RA Nadhira Asy Syafa was established in the 2020/2021 academic year, beginning its kindergarten education activities with 24 students and 2 assistant teachers. The number of students has continued to increase over the years: 59 students in 2022, 75 in 2023, and 82 by 2024, distributed across the PAUD, TK A, and TK B levels, supported by 8 assistant teachers. The school is situated within the Pondok Nusantara residential complex and can be accessed both from within and outside the housing area. Most students come from the surrounding areas of Marendal, Patumbak, and Amplas. Although not highly visible from the main road, the school continues to operate well, sustained by the strong track record of its students and alumni.

Based on preliminary observations, interviews, and discussions with the school principal and teachers, the main challenge identified was the limited opportunity for teachers to engage in structured training and practical mentoring on the development of interactive learning media. Although the teachers had previously used a variety of learning materials and independently explored creative ideas through social media, they had limited experience in systematically designing and producing three-dimensional interactive media tailored to specific classroom themes and children's developmental needs. Teachers generally developed their creativity by drawing on content available on social media, which tended to be repetitive and monotonous. Community empowerment itself refers to efforts aimed at enhancing the capacity of individuals or groups within society so that they can manage available resources and improve their welfare (Chan & Tay, 2018). One form of community empowerment is the use of education as a means to introduce new knowledge, skills, and innovation (Anwar & Shawmi, 2023). Within this context, creative and enjoyable learning methods are essential to attract children's interest and engagement (Komari et al., 2022).

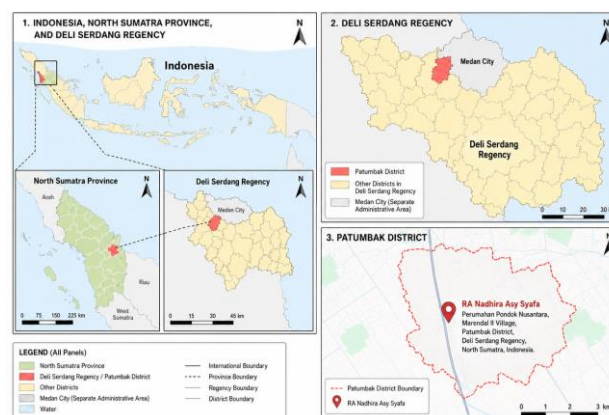


Figure 1. Study location maps

One innovative approach in children's education is the use of interactive visual media, such as pop-up books (Mustika & Ain, 2020). A pop-up book contains three-dimensional elements that emerge as the pages are opened, thereby enriching children's learning

experiences through a more visual and interactive format (Ulfa & Nasryah, 2020). This medium provides opportunities for children to actively participate in learning and encourages them to think creatively (Taylor & Bluemel, 2003). This community service activity focuses on community empowerment through the use of interactive pop-up books as a creative learning medium. The use of pop-up books is expected to introduce an enjoyable and beneficial learning method for children in the local community, particularly in areas with limited access to innovative education (Khairuni et al., 2025). Accordingly, the objectives of this community service program were: (1) to identify the partner's needs and limitations in developing creative learning media; (2) to collaboratively design and produce interactive pop-up books using accessible and affordable materials; (3) to strengthen teachers' practical capacity to use and potentially reproduce interactive visual media; (4) to implement the developed media through a learning-by-playing approach; and (5) to evaluate user responses regarding student engagement, early reading responses, creativity, and the perceived usefulness of pop-up books in supporting learning activities.

Media constitutes one form of innovative product capable of enhancing motivation in teaching and learning activities (Ulfa & Nasryah, 2020). Learning media refers to any means used as a channel or intermediary to deliver messages or materials to learners, thereby reducing obstacles in the communication process (Yanto et al., 2023). Various types of learning media exist (Anwar & Shawmi, 2023), one of which is three-dimensional visual media. Three-dimensional media refers to a group of non-projected media presented visually in three dimensions, observable in terms of length, width, and height (Pratiwi et al., 2020). Early childhood learners are in the concrete-operational stage of cognitive development; therefore, visual and interactive learning is more readily understood by this age group (Khairuni et al., 2024). Learning media that are both attractive and appropriate to early childhood characteristics are essential for stimulating learning interest and facilitating the understanding of basic concepts (Sari & Suryana, 2019). One particularly effective and appealing medium is the pop-up book—a three-dimensional storybook that displays moving images upon opening, thereby capturing children's attention and enhancing their learning experience. The implementation of this medium not only conveys information visually but also encourages children to interact directly with the material, stimulating their creativity, language skills, and fine motor abilities (Wulandari et al., 2020).

The problems identified through situational analysis were subsequently discussed with the partner as the basis for determining findings and proposing solutions to be implemented by the head of the Community Partnership Program proposal team (Arip & Aswat, 2021). The proposed educational solution was the implementation of pop-up book media. Unlike ordinary books, pop-up books employ complex paper mechanisms that allow images to rise, move, or change shape as pages are opened or closed. This creates an element of surprise and excitement for readers, particularly children, thereby increasing their interest in both books and learning more broadly. Pop-up books are not limited to children's storybooks alone (Yanto et al., 2023); pop-up techniques are also increasingly applied across various book types, including textbooks, art books, greeting cards, and even publications intended for adult readers. The distinctiveness of pop-up books lies in their ability to combine visual elements, tactile engagement, and movement, thereby creating a richer and more immersive reading experience (Pratiwi et al., 2020).

Accordingly, the novelty of this community service program lies in positioning the pop-up book not merely as a learning product delivered to the school, but as a medium for teacher capacity building through participatory design and hands-on production. The program integrates community empowerment, visual communication, creative production,

storytelling, and early childhood learning into a single collaborative implementation model.

METHODS

This community service program was conducted at RA Nadhira Asy Syafa, Marendal II Village, Patumbak District, Deli Serdang Regency. The partners in this activity were the school principal and assistant teachers who are directly involved in early childhood learning activities. This program aimed to improve teachers' creativity in developing interactive visual learning media through training and mentoring in the production of pop-up books as creative learning tools for children, while also supporting more engaging, inclusive, and context-based classroom practices aligned with the developmental needs of early childhood learners at school. The implementation method used a participatory, educational, and practical approach. The participatory approach was carried out by involving the partners from the problem identification stage to planning, theme selection, media production, and implementation media (Sarwa et al., 2026). The educational approach was applied through socialization and training activities for teachers regarding the importance of interactive visual media in early childhood learning. The practical approach was implemented through hands-on practice in producing pop-up books, mentoring in the use of the media, and evaluating the results of the activity.

The program began with an initial observation at the partner's location to identify the learning conditions (Prayogo et al., 2024; Sutanhaji et al., 2026; Chaerul et al., 2025), available learning media, and teachers' needs in developing creative learning tools. The observation was followed by interviews with the school principal and teachers to explore the problems faced by the school. Based on the observation and interview results, it was found that teachers still needed stronger skills in creating innovative, attractive, and age-appropriate learning media for early childhood education. Therefore, the solution offered was training and mentoring in the development of interactive visual media based on pop-up books. The implementation consisted of several stages. The first stage was coordination and discussion with the partner to align the objectives, schedule, target participants, and forms of activity (Sarwa et al., 2026; Prayogo, 2026; Ersu et al., 2026; Luthan et al., 2022). At this stage, the community service team and the partner determined pop-up book themes that were relevant to children's learning needs, such as environmental awareness, local culture, clean living habits, and social skills. The second stage was media design, which included developing the story concept, preparing design sketches, selecting illustrations, choosing materials, and determining the pop-up mechanisms to be used. The third stage was training teachers and partners in producing the media (Prayogo et al., 2022; Prayogo et al., 2024; Sarwa et al., 2026).

The fourth stage was the collaborative production of pop-up book media involving the community service team, students, and partners. The fifth stage was the trial implementation of the media in classroom learning. Teachers used the completed pop-up books as learning aids in the classroom. Children were given the opportunity to observe, touch, open, and interact directly with the media. The sixth stage was evaluation. The evaluation questionnaire was completed by 12 respondents ($n = 12$) who were directly involved in or observed the implementation of the pop-up book media. Responses were recorded using a four-point Likert scale consisting of Strongly Agree, Agree, Disagree, and Strongly Disagree. The success of this activity was measured through several indicators, including increased teacher understanding of interactive visual media, improved teacher skills in producing pop-up books, the availability of learning media products that can be used at school, and positive responses from children when the media were applied in learning activities. In addition, this activity was expected to encourage teachers to continue developing learning media independently.

This activity is expected to make a practical contribution to improving teachers' capacity to develop creative and applicable learning media for classroom-based early childhood learning activities. The pop-up book products produced through this program function not only as learning aids but also as media that can stimulate children's learning interest, creativity, language skills, and fine motor development. In addition, the activity strengthens teachers' confidence in designing simple, low-cost, and attractive teaching materials that can be adapted to various classroom themes using available materials and familiar storytelling approaches. Through direct practice, discussion, and mentoring, teachers gain experience in selecting content, arranging illustrations, and applying interactive elements that match children's characteristics. Through this training and mentoring program, the partner is expected to be able to develop similar media independently and sustainably according to the learning needs of RA Nadhira Asy Syafa. The program also encourages continuous innovation, collaboration among teachers, and broader use of visual media to support joyful learning in early childhood education settings. This outcome is important for maintaining long-term educational quality at school and strengthening teacher readiness for future learning innovations.

RESULT AND DISCUSSION

Preparation and Theme Determination of the Pop-Up Book Media

The preparation stage began with coordination among the community service team, students, the school principal, and teachers of RA Nadhira Asy Syafa to identify the needs of the activity. This discussion was important because the media to be developed had to be visually attractive, suitable for classroom conditions, appropriate for children's age, easy for teachers to use, and made from accessible materials. As shown in [Table 1](#), the initial activities included observation, problem identification, coordination, activity planning, and pop-up book media design. At this stage, the teachers explained the learning materials commonly used in class, while the community service team helped translate these needs into a simple and applicable media concept.

Table 1. Stages of activity implementation and partner participation

No.	Implementation Stage	Activity Form	Partner Participation
1	Observation and problem identification	Observing school conditions, learning media, and teachers' needs	Providing information related to learning conditions and challenges faced
2	Coordination and activity planning	Preparing the schedule, target participants, activity themes, and training format	Participating in discussions and agreeing on the activity implementation plan
3	Pop-up book media design	Determining themes, storylines, illustration designs, materials, and pop-up mechanisms	Providing input on themes suitable for children's learning needs
4	Media production training	Providing training on pattern-making, cutting, folding, pasting, and book arrangement techniques	Participating in the training and directly practicing media production
5	Learning media production	Producing pop-up books collaboratively with the team, students, and teachers	Contributing to story content, illustrations, and media arrangement
6	Classroom implementation	Using pop-up books as learning media for early childhood education	Applying the media in learning activities with children
7	Evaluation and mentoring	Conducting observation, interviews, and discussion on the implementation results	Providing feedback on the benefits, challenges, and sustainability of media use

The selected themes were directed toward topics close to children's daily lives, such as the surrounding environment, animals, family, clean living habits, and nature recognition. These themes were chosen because early childhood learning requires concrete objects, clear colors, recognizable shapes, and enjoyable learning experiences. The preparation stage also considered the teachers' ability to reproduce the media independently. Therefore, the theme was not designed to be overly complex. Each visual element was considered based on how easy it was to cut, fold, paste, open, and explain during classroom learning. Ulfa and Nasryah (2020) stated that pop-up books can increase learning motivation because they provide attractive visual displays and offer students a different learning experience. Pratiwi et al. (2020) also showed that pop-up books are suitable for early childhood learning because they can attract children's attention and support language development. The documentation of this initial process is presented in Figure 2, which shows the preparation activity for determining the theme of the pop-up book with the team and students.

Theme determination was not carried out only by the implementation team. Teachers were actively involved so that the media content remained relevant to the learning patterns of children at RA Nadhira Asy Syafa. This involvement was important because teachers understand children's characteristics, learning habits, and the types of materials that are most easily accepted in class. As presented in Table 1, partner participation was reflected in providing information about classroom conditions, giving input on suitable themes, and participating in the development of storylines and illustration forms. This process helped the team design a pop-up book that was not too complicated but still included movement, color, storytelling, and simple play elements. Sari and Suryana (2019) explained that thematic pop-up books can become practical learning media for early childhood education because themes that are familiar to children can encourage positive responses from both teachers and students. Mustika and Ain (2020) also showed that project-based pop-up book production can improve creativity in designing learning media. Yanto et al. (2023) added that pop-up books have a positive impact on the learning process because they can strengthen students' understanding, motivation, and visual learning experience. In this activity, the results of the theme discussion were then developed into initial sketches, image selections, paper materials, book size, and pop-up mechanisms that were easy for teachers and students to produce. Several themes were selected because they were closely related to children's daily experiences, allowing teachers to connect them with short stories, question-and-answer activities, color recognition, shape recognition, and fine motor activities. Teachers' input was also used to adjust the page sequence, the complexity of the images, and the safety of the interactive elements when the media was used directly by children in the classroom.



Figure 2. Preparation activities for determining the theme of the pop-up book

Teacher Capacity Building through Interactive Visual Media Training

Teacher capacity building was conducted through interactive visual media training that focused on the concept, function, and classroom use of pop-up books in early childhood learning. This activity was important because the teachers of RA Nadhira Asy Syafa still needed practical support in developing learning media that were creative, simple, and suitable for children. As presented in Table 1, the training stage covered the introduction of tools and materials, pattern-making techniques, cutting, folding, pasting, page arrangement, and the assembly of three-dimensional book elements. The educational session shown in Figure 3 introduced the pop-up book as more than a picture book. It was explained as a learning medium that combines stories, colors, movement, touch, and visual surprise. The material was delivered in a simple way so that teachers could understand each part of the book and relate it to daily classroom activities. Arip and Aswat (2021) emphasized that teachers play an important role as creators of attractive and useful learning conditions. Ulfa and Nasryah (2020) also showed that pop-up book media can increase students' learning motivation because it provides a more visual and engaging learning experience. In this activity, the explanation was supported by direct examples, so teachers could see how the media could be opened, introduced, and used to invite children to respond to the story, images, colors, and learning messages.

The training was not limited to theoretical explanation. Teachers were also guided to understand the practical steps needed to produce and use pop-up book media independently. They observed sample products, identified suitable paper materials, discussed safe image sizes, and learned simple techniques for making pop-up elements. This approach was adjusted to the nature of community service activities, which should provide direct experience that partners can easily repeat after the program. Mustika and Ain (2020) reported that project-based pop-up book production can improve creativity in developing learning media. Pratiwi et al. (2020) also found that pop-up books are appropriate for early childhood education because they attract children's attention and support language learning. Wulandari et al. (2020) added that pop-up book media based on a balanced literacy approach can support children's reading skills through a valid, practical, and effective learning product. During the training, teachers were encouraged to ask questions, try the techniques, revise patterns, and adjust the media to classroom themes. The discussion was carried out in a friendly atmosphere so that the participants did not feel that producing learning media had to be difficult or expensive. Teachers also discussed how to maintain the media, strengthen folded parts, choose suitable glue, store the book properly, and manage children's turns when using the media together (Figure 3). These inputs were useful for improving the product before it was applied in classroom learning activities (Prayogo et al., 2024; Azahar et al., 2026).





Figure 3. Educational session on pop-up book media for kindergarten teachers

Collaborative Production of Thematic Pop-Up Book Media

The production of thematic pop-up book media was carried out after the team and partner agreed on the theme, storyline, materials, and visual form to be used. At this stage, the activity was not only focused on producing a product but also served as a shared learning process involving lecturers, students, teachers, and the school. As shown in Table 1, the production stage included media production training, learning media production, and partner contributions to the story content, illustrations, and media arrangement. Teachers provided input on themes that were close to children's daily experiences, while students helped translate these ideas into images, patterns, folds, and three-dimensional forms. This process is shown in Figure 5, which presents the production of the pop-up book based on the theme determined with the team, and Figure 6, which shows the involvement of architecture students in making the media. The developed themes included nature, animals, family, the solar system, marine animals, and the surrounding environment. These themes were selected because they are familiar to children and can be connected with storytelling, color recognition, shape identification, and simple object understanding. Mustika and Ain (2020) showed that producing pop-up books through project-based activities can improve participants' creativity because they are directly involved in planning and media production. Sari and Suryana (2019) also explained that thematic pop-up books are suitable for early childhood education because themes that are close to children's experiences can support language development and learning responses. In this activity, the production process began with initial sketches, image selection, pattern cutting, folding, pasting, and page assembly (Figure 4).





Figure 4. Production of the pop-up book based on the theme determined with the team

The materials used in media production were selected because they were easy to find, affordable, and safe for children's learning activities. The team used duplex paper and HVS paper as the main materials because they were strong enough to support the pop-up elements, yet still easy for beginners to cut and fold. This choice was in line with the purpose of the community service activity, which was to produce learning media that teachers could reproduce using simple tools. Ulfa and Nasryah (2020) stated that pop-up books can increase learning motivation because their visual appearance is attractive and different from ordinary books. Pratiwi et al. (2020) also emphasized that pop-up books can attract children's attention and support language development through a more vivid visual experience. In practice, teachers and students discussed page size, image position, fold strength, and how to open the pop-up parts so that they would not be easily damaged. Each page was arranged so that teachers could use it for storytelling, asking short questions, and inviting children to touch certain parts in turns. Wulandari et al. (2020) explained that pop-up books can support early reading skills because children gain a more concrete and enjoyable learning experience. The production activity also gave the partner new experience in understanding that learning media do not always have to be purchased as ready-made products. Teachers can develop similar media according to weekly classroom themes, such as family, clean environment, occupations, plants, or animals. During this process, the team also emphasized neatness, safe paper edges, bright color selection, and the strength of glued parts (Figure 5). These aspects were important because the media would be used by early childhood learners who actively touch, open, and observe each page directly. Teachers' feedback was used to improve the image forms and story sequence. This approach made the production process practical and easy for the school partner to follow.



Figure 5. Preparation by architecture students

Classroom Implementation through a Learning-by-Playing Approach

The classroom implementation of the pop-up book was carried out through a learning-by-playing approach so that children could learn by seeing, touching, asking questions, and telling stories. At this stage, the product that had been developed was not used only as an ordinary reading material but was introduced as an interactive storytelling medium. Teachers and students introduced the book content through storytelling, simple demonstrations, short discussions, and turn-taking practice in opening the pop-up pages. This activity was in line with Table 1, particularly the classroom implementation stage, in which the pop-up book was used as a learning medium for early childhood education with teacher involvement in the learning process. Figure 6 shows the learning-by-playing approach, where children were introduced to the book content through stories and light play activities. This approach was selected because early childhood learners understand materials more easily through concrete experiences, enjoyable situations, and teacher guidance that still provides space for exploration. Weisberg et al. (2013) explained that guided play positions children as active participants in learning because teachers provide learning goals without removing the element of play. Rahiem (2021) also showed that storytelling can make learning activities more attractive, communicative, and closely related to children's worlds. In this activity, architecture students helped explain building forms, colors, characters, and visual objects in the book. Children were invited to name pictures, answer simple questions, guess the next page, and point to moving parts. Teachers accompanied the children so that the media could be used in an orderly and safe manner. This interaction helped make the classroom more active, especially when children responded to the stories, pictures, and movements on the book pages.



Figure 6. The implementation activity

The classroom implementation showed that the pop-up book helped teachers deliver learning materials in a more visual and child-friendly way. Figure 8 presents the results of the implementation activity after the media was used in the learning process with students

of RA Nadhira Asy Syafa. Children appeared more interested because the book contained three-dimensional forms, bright colors, and parts that could be opened or moved. This finding is in line with Pratiwi et al. (2020), who stated that pop-up books are suitable for early childhood learning because they can attract students' attention and support language development. Ulfa and Nasryah (2020) also showed that pop-up books can increase learning motivation through visual displays that are different from ordinary books. The data in Table 2 support these results. A total of 25.0% of respondents strongly agreed and 41.7% agreed that student engagement increased. For the reading ability indicator, 16.7% of respondents strongly agreed and 50.0% agreed. The creativity indicator also showed a positive result, with 41.7% strongly agreeing and 50.0% agreeing. The strongest response appeared in the indicator stating that the pop-up book helped learning, with 75.0% strongly agreeing and 16.7% agreeing. Wulandari et al. (2020) explained that literacy-based pop-up book media can become a practical and effective learning product to support reading skills. During the activity, teachers also observed that this medium could be used for question-and-answer sessions, color recognition, shape recognition, language practice, and fine motor activities. Some children still needed guidance when opening the pop-up parts, so teachers arranged turns and gave examples of how to hold the book carefully. This process provided a clear picture of how simple media can be used in child-friendly learning activities based on direct classroom practice with the accompanying teachers.

Student Engagement, Reading Ability, Creativity, and Learning Support

The indicators of student engagement, reading ability, creativity, and learning support were used to observe the initial impact of using the pop-up book after classroom implementation. The data in Table 2 show that the responses from students and teachers were generally positive, especially regarding the use of the media as a learning aid. For the student engagement indicator, 25.0% of respondents strongly agreed and 41.7% agreed that students became more engaged when the pop-up book was used. This result indicates that three-dimensional visual media can attract children's attention through shape, color, movement, and stories that are close to their daily experiences. This condition is also shown in Figure 8, which presents the results of the implementation activity with students. Children did not only look at the book but also paid attention to the pages, named objects, followed the story, and responded to the teacher's questions. Weisberg et al. (2013) explained that play-based learning guided by teachers can help children actively explore learning materials. Ulfa and Nasryah (2020) also showed that pop-up books can increase learning motivation because they provide a visual experience that is different from ordinary books. For the reading ability indicator, 16.7% of respondents strongly agreed and 50.0% agreed. This result shows a positive initial response, although some students still needed teacher guidance in recognizing words, pictures, or story sequences. Wulandari et al. (2020) stated that literacy-based pop-up book media can support early reading skills because children learn through the connection between text, images, and direct activities. This result shows that the pop-up book functions as a child-friendly learning bridge, especially when teachers use it with short stories and simple question-and-answer activities.

Table 2. Indicators of the success of the community empowerment activity

No	Indicator	SS n (%)	S n (%)	TS n (%)	STS n (%)
1	Student engagement	25,0	41,7	33,3	0
2	Students' reading ability	16,7	50,0	33,3	0
3	Student creativity	41,7	50,0	0	8,3
4	Pop-up books support learning	75,0	16,7	0	8,3

The creativity aspect also showed positive results. In Table 2, 41.7% of respondents strongly agreed and 50.0% agreed that students' creativity increased after using the pop-up book. Children appeared more interested in guessing pictures, naming colors, observing moving parts, and responding to the story delivered by the teacher. Pratiwi et al. (2020) explained that pop-up books can attract early childhood learners' attention and support language development through vivid visual displays. Sari and Suryana (2019) also showed that thematic pop-up books are suitable for children's learning because themes that are close to their lives can encourage language responses and imagination. The strongest response in Table 2 appeared in the indicator stating that the pop-up book helped learning, with 75.0% of respondents strongly agreeing and 16.7% agreeing. This result shows that teachers and students accepted this medium as a learning aid that is easy to use and attractive for classroom activities. Figure 9 presents the feedback diagram of the community empowerment activity, which supports the finding that this medium provides a more enjoyable learning experience. Nevertheless, 33.3% of respondents disagreed with the indicators of student engagement and reading ability (Figure 7). This data should be interpreted reasonably because children's abilities vary, and some children still need time to adjust to new learning media. Mustika and Ain (2020) emphasized that project-based media production can encourage creativity, but its success still requires assistance, practice, and adjustment to user needs. These results provide opportunities for teachers to continue developing pop-up books through theme variations, stories, light games, and fine motor activities that suit children's classroom characteristics.

Feedback, Challenges, and Sustainability of Pop-Up Book Media Use

Feedback activities were conducted after the pop-up book media was used in learning activities with the students and teachers of RA Nadhira Asy Syafa. This stage is in line with Table 1, particularly the evaluation and mentoring stage, in which the partner was asked to provide input regarding the benefits, challenges, and sustainability opportunities of the media. The evaluation was carried out through observation, discussion, and a simple questionnaire that summarized the experiences of teachers and students during the activity. Figure 9 presents the feedback diagram of the community empowerment activity, while Table 2 shows responses based on four main indicators. The results show that the pop-up book was well accepted as a learning aid. For the indicator stating that the pop-up book helped learning, 75.0% of respondents strongly agreed and 16.7% agreed. This result indicates that three-dimensional visual media helped teachers deliver learning materials in a more attractive and observable way for children. Ulfa and Nasryah (2020) explained that pop-up books can increase learning motivation because they provide a visual display that is different from ordinary books. Wulandari et al. (2020) also showed that literacy-based pop-up book media can help children understand the relationship between images, text, and reading activities. Teacher feedback showed that students became more enthusiastic when the book pages were opened, images appeared, and stories were delivered directly. Children were also more easily encouraged to name objects, recognize colors, answer questions, and follow the storyline. Some teachers stated that this medium could be reused for other themes, especially when the design is simple and the materials are easy to obtain. Figure 8 also supports this finding because it shows the implementation activity involving students directly in a more active learning atmosphere. Teachers could use the media as a storytelling trigger before entering the main learning material.

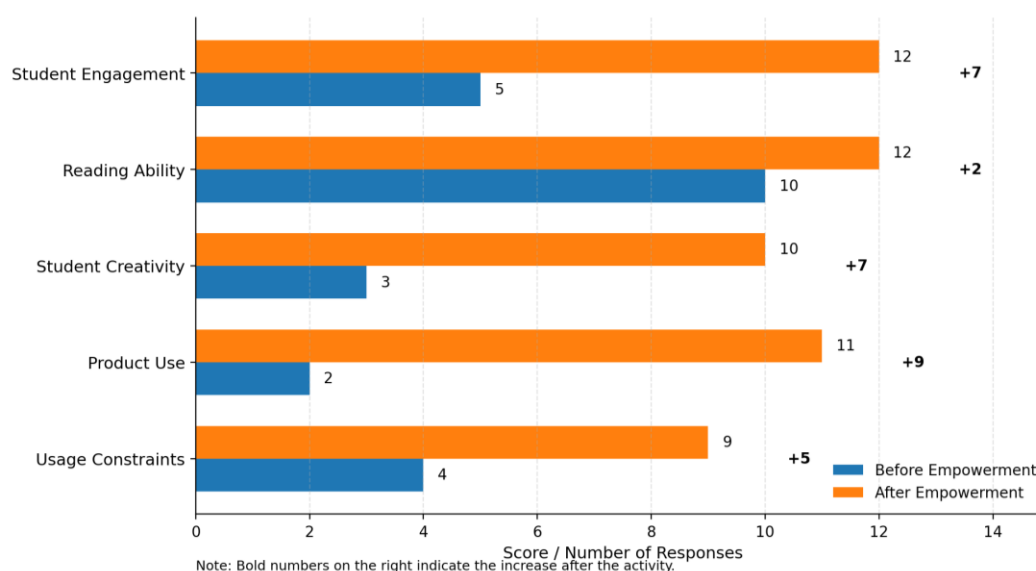


Figure 7. Diagram of feedback results from the empowerment activity

The challenges in using the media also need to be noted so that future development can be more realistic. Most respondents stated that they did not face major obstacles when using the pop-up book. However, several inputs were related to the need for additional time, cost, and creativity in producing the media. This input is important because teachers have to prepare learning media while also carrying out their regular teaching duties. In Table 2, 33.3% of respondents disagreed with the indicators of student engagement and reading ability. This result shows that children's responses were not always the same. Some children needed longer guidance when reading pictures, recognizing texts, or opening the pop-up parts carefully. Pratiwi et al. (2020) stated that pop-up books can support children's language development, but their use still requires teacher guidance through age-appropriate activities. Mustika and Ain (2020) emphasized that project-based media production can encourage creativity, but the process requires practice and clear task distribution. Yanto et al. (2023) also explained that pop-up books have a positive influence on science learning because they provide visual and concrete experiences for students. Suggestions from respondents included adding more varied materials, brighter colors, more interactive forms, paper textures, stickers, simple games, and digital development through QR codes, sound, music, or animated illustrations. Teachers can also involve parents in producing simple media at home so that the use of pop-up books does not stop only at the school-based community service activity. Further mentoring can focus on developing page templates, media maintenance guidelines, and a theme bank that teachers can choose according to the weekly classroom needs.

CONCLUSION

The community service program through the development of interactive pop-up book media at RA Nadhira Asy Syafa showed that three-dimensional visual media can serve as a practical and well-accepted creative learning tool for the partner. The training, demonstration, and hands-on practice helped teachers understand the process of designing, producing, using, and maintaining learning media in a simple and affordable way. The implementation results indicated increased student interest and engagement, more active interaction during the learning process, and support for children's creativity, reading ability, and fine motor development. Feedback from the respondents also showed that the

pop-up book helped deliver learning materials in a more attractive, visual, and understandable manner for children. Nevertheless, this activity still had several limitations, particularly the limited scope of the partner, the relatively short mentoring period, and the need for additional time, cost, and creativity in producing the media. In addition, the variation of learning materials and interactive features in the developed media still needs to be expanded so that it can be applied to a wider range of learning themes. For future activities, the development of pop-up book media should focus on broader theme variations, more diverse materials, and additional creative activities such as drawing, pasting, storytelling, or simple games. This medium also has potential for further development through the integration of simple technologies, such as QR codes, sound, music, digital illustrations, or other interactive elements. Further development should also be accompanied by a more measurable evaluation to assess the impact of the media on children's cognitive, creative, and fine motor development more comprehensively.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES

- Anwar, S., & Shawmi, A. N. (2023). Community-based education model to empower communities in utilizing local potential: Analysis study on community-based learning centers in Lampung Province. *Al-Tadzkiyyah: Jurnal Pendidikan Islam*, 14(2), 313–337. <https://doi.org/10.24042/00202314362300>
- Arip, M., & Aswat, H. (2021). Media pop up book untuk meningkatkan hasil belajar siswa pada mata pelajaran IPA di sekolah dasar. *Edukatif: Jurnal Ilmu Pendidikan*, 3(1), 261–268. <https://doi.org/10.31004/edukatif.v3i1.329>
- Azahar, R., Hariyanto, V. L., Prayogo, W., & Fitria, L. (2026). Fostering green skills in vocational students: The impact of learning environment, attitudes, and competence. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 8(1), 203–223. <https://doi.org/10.23917/ijolae.v8i1.11746>
- Chaerul, M., Daffa, A. S. N., Kholif, A. N., Aisyarah, N. R., Nurulloh, R. H., & Prayogo, W. (2025). Applying circular economy principles to strengthen organic waste management using BSF maggots in RW 02 Jamaras, Bandung, Indonesia. *International Journal of Community Engagement Payungi*, 5(3), 468–485. <https://doi.org/10.58879/ijcep.v5i3.110>
- Chan, C. O., & Tay, H. L. (2018). Combining lean tools application in kaizen: A field study on the printing industry. *International Journal of Productivity and Performance Management*, 67(1), 45–65. <https://doi.org/10.1108/IJPPM-09-2016-0197>
- Ersa, N. S., Yusrizal, T., Gustami, H., Akmal, A., Najmuddin, N., Herdianti, W., & Prayogo, W. (2026). Penerapan pemurnian air darurat pasca banjir bandang dengan pelatihan masyarakat untuk peningkatan ketahanan lokal di Aceh, Indonesia. *Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM)*, 9(4), 377–398. <https://doi.org/10.33024/jkpm.v9i4.25352>
- Khairuni, Z. I., Matondang, Z., Handayani, P. H., Atika, L., & Rahmadani, S. (2024). Multifunctional furniture: Accompanying and creating child-friendly furniture. *Dinamisia: Jurnal Pengabdian Kepada Masyarakat*, 8(4), 1060–1069. <https://doi.org/10.31849/dinamisia.v8i4.19912>
- Khairuni, Z. I., Yuzni, S. Z., Atika, L., Hutria, W., & Putri, M. D. (2025). Implementasi pop-up book sebagai media visual interaktif pada siswa RA Nadhira Asy Syafa. In *Seminar Nasional PKM: Inovasi Teknologi untuk Pemberdayaan Komunikasi*

- Menyongsong Kesejahteraan melalui Implementasi Teknologi Berbasis Solusi Universitas Negeri Medan Tahun 2025 (pp. 185–189). Universitas Negeri Medan.
- Komari, M., Widiyaningrum, P., & Partaya, P. (2022). Development of pop up book to increase interest and learning outcomes. *Journal of Innovative Science Education*, 11(1), 22–29. <https://doi.org/10.15294/jise.v10i1.46881>
- Luthan, P. L. A., Prayogo, W., Sitanggang, N., & Yacub, M. (2022). Runoff-stormwater management at Ridho Residence using the rain garden. *ABDIMAS: Jurnal Pengabdian Masyarakat*, 5(2), 2720–2730. <https://doi.org/10.35568/abdimas.v5i2.2757>
- Mustika, D., & Ain, S. Q. (2020). Peningkatan kreativitas mahasiswa menggunakan model project based learning dalam pembuatan media IPA berbentuk pop up book. *Jurnal Basicedu*, 4(4), 1167–1175. <https://doi.org/10.31004/basicedu.v4i4.518>
- Pratiwi, K. B., Sugito, S., & Subandowo, M. (2020). The development pop-up books to improve children's language skills. *JKTP: Jurnal Kajian Teknologi Pendidikan*, 3(4), 408–414. <https://doi.org/10.17977/um038v3i42020p408>
- Prayogo, W. (2026). Peran organisasi mahasiswa dalam penguatan pengabdian kepada masyarakat: Studi kasus Ikatan Mahasiswa Teknik Lingkungan Indonesia periode 2015/2016. *Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM)*, 9(4), 337–362. <https://doi.org/10.33024/jkpm.v9i4.25371>
- Prayogo, W., Novrianty, I., Purwanti, A., Mulyana, R., Panjaitan, N. H., Fitria, L., Awfa, D., Ikhwal, M. F., Zamani, I. S., Arifianingsih, N. N., Muklis, M., Purnawan, P., Sunarsih, S., Suryawan, I. W. K., Azizah, R. N., Imami, A. D., & Septiariva, I. Y. (2022). Pelatihan pengolahan sampah dengan metode Takakura dan pembuatan stringbag bagi kelompok anak usia dini di Desa Bukit Lawang, Sumatera Utara. *International Journal of Community Service Learning*, 6(3), 381–395. <https://doi.org/10.23887/ijcs.v6i3.50044>
- Prayogo, W., Ratnaningsih, W., Suhardono, S., & Suryawan, I. W. K. (2024). Environmental education practices in Indonesia: A review. *Journal of Sustainable Infrastructure*, 3(1). <https://doi.org/10.61078/jsi.v3i1.27>
- Rahiem, M. D. H. (2021). Storytelling in early childhood education: Time to go digital. *International Journal of Child Care and Education Policy*, 15, Article 4. <https://doi.org/10.1186/s40723-021-00081-x>
- Sari, N. E., & Suryana, D. (2019). Thematic pop-up book as a learning media for early childhood language development. *JPUD: Jurnal Pendidikan Usia Dini*, 13(1), 43–57. <https://doi.org/10.21009/JPUD.131.04>
- Sarwa, S., Azahar, R., Salamah, U., Sitorus, H. F., Zulfikar, A., Putra, R., Fatahillah, A., Atika, L., & Prayogo, W. (2026). Peningkatan kualitas layanan pembelajaran flipped classroom melalui penguatan literasi digital pada dosen Fakultas Teknik Universitas Negeri Medan, Indonesia. *Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM)*, 9(5), 273–292. <https://doi.org/10.33024/jkpm.v9i5.25386>
- Sutanhaji, A. T., Susilo, A., Hardoko, H., Rahardjo, S. S. P., Khotimah, M., Setyono, L., Hamada, I. F., & Prayogo, W. (2026). Penguatan BUMDes melalui diseminasi teknologi eco-enzyme dan pupuk organik untuk mendukung perencanaan TPS3R di Desa Tegalweru, Kabupaten Malang, Indonesia. *Jurnal Pengabdian Masyarakat*, 4(1), 6–20. <https://doi.org/10.59562/abdimas.v4i1.12105>
- Taylor, R. H., & Bluemel, N. L. (2003). Pop-up books: An introductory guide. *Collection Building*, 22(1), 21–32. <https://doi.org/10.1108/01604950310457177>
- Ulfa, M. S., & Nasryah, C. E. (2020). Pengembangan media pembelajaran pop-up book untuk meningkatkan motivasi belajar siswa kelas IV SD. *Edunesia: Jurnal Ilmiah Pendidikan*, 1(1), 10–16. <https://doi.org/10.51276/edu.v1i1.44>

- Weisberg, D. S., Hirsh-Pasek, K., & Golinkoff, R. M. (2013). Guided play: Where curricular goals meet a playful pedagogy. *Mind, Brain, and Education*, 7(2), 104–112. <https://doi.org/10.1111/mbe.12015>
- Wulandari, N., Hendratno, H., & Indarti, T. (2020). Development of pop-up book media based on balanced literacy approach to improve skills of reading class 1 students basic school. *International Journal of Multicultural and Multireligious Understanding*, 7(5), 619–627. <https://doi.org/10.18415/ijmmu.v7i5.1693>
- Yanto, N., GH, M., & Zubair, S. (2023). The effect of pop-up book media in science learning: A literature review. *EduLine: Journal of Education and Learning Innovation*, 3(2), 214–220. <https://doi.org/10.35877/454RI.eduline1772>