

Eco-Friendly Media: Assistance in Developing Educational Props from Waste Materials in Probolinggo City

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Abstract. This community engagement was driven by the limitations of resources and adequate facilities within the early childhood education environment. The restricted or monotonous use of educational props, coupled with financial limitations within the institution, constrains the variety and creativity in the learning process. Additionally, the lack of understanding regarding the potential use of waste materials as educational props hinders more engaging teaching innovations. This community engagement aimed to introduce the creation of educational props using waste materials available within the school environment by providing engaging learning stimuli, thereby making the content delivered by teachers more effective and efficient. The approach used in this community engagement was Asset-based Community Development (ABCD). The approach enables the community to build upon existing strengths without depending on external assistance. This approach began by identifying the assets possessed by the community, which were then utilized to develop the educational institution. The outcomes of this engagement indicated some important points. First, teachers, in early childhood educational institutions in Probolinggo City, understood appropriate stimuli for the growth and development of students, demonstrating competence in pedagogic skills as one of the essential competencies for teachers. Secondly, teachers in these institutions could utilize waste materials to create Educational Play Tools (EPT) through identifying recyclable waste, training, and practical application in crafting these tools. Thirdly, teachers were capable of harnessing local potential previously untapped, which could be used to support learning activities by turning them into Educational Play Tools (EPT).

Katakunci: Media Ramah Lingkungan, Alat Peraga

Abstrak. Kegiatan ini dilatarbelakangi oleh keterbatasan sumber daya dan fasilitas yang kurang memadai di lingkungan pendidikan anak usia dini. Penggunaan alat peraga edukatif yang terbatas atau monoton, ditambah dengan keterbatasan finansial lembaga,

*Pendidikan,
Bahan Limbah*

membatasi variasi dan kreativitas dalam pembelajaran. Selain itu, kurangnya pemahaman akan potensi penggunaan bahan limbah sebagai alat peraga edukatif menjadi hambatan dalam inovasi pembelajaran yang lebih menarik. Pengabdian ini bertujuan mengenalkan pembuatan alat peraga edukatif dengan menggunakan bahan limbah yang ada di lingkungan sekolah dengan tujuan memberikan stimulasi pembelajaran yang menarik, sehingga materi yang disampaikan guru lebih efektif dan efisien. Metode yang digunakan dalam proses pendampingan ini adalah *Asset-based Community Development* (ABCD). Pendekatan ini memungkinkan komunitas dampingan membangun dengan kekuatan yang sudah ada tanpa tergantung bantuan dari pihak luar. Oleh karena itu, pendekatan ini dimulai dengan mengidentifikasi aset yang dimiliki oleh komunitas untuk kemudian dimanfaatkan untuk membangun lembaga pendidikannya. Hasil pengabdian menunjukkan beberapa poin penting. Pertama, guru lembaga pendidikan anak usia dini di kota Probolinggo memahami stimulasi yang tepat untuk tumbuh kembang anak didik, sehingga kompetensi pedagogik yang dimiliki guru semakin meningkat. Kedua, guru dapat memanfaatkan bahan limbah menjadi alat peraga edukatif (APE) melalui proses identifikasi limbah yang dapat dimanfaatkan, pelatihan, dan praktek pembuatan. Ketiga, guru dapat memanfaatkan potensi lokal yang selama ini tidak termanfaatkan yang sebenarnya dapat digunakan untuk menunjang kegiatan pembelajaran dengan menjadikannya sebagai alat permainan edukatif (APE).

1. Introduction

The learning process in early childhood is a stage that requires a special approach, where the provision of stimulation or stimuli must be adjusted to their level of development. According to Etivali & PS (2019), early childhood children have unique characteristics in terms of growth and development. This period, often referred to as the golden age, occurs between the ages of 0-5 years. During this period, it is important to provide optimal and appropriate stimulation because a child's intellectual ability will not develop as well as it does during this time according to research by Trenggonowati & Kulsum (2018). Therefore, this period is considered crucial because it has a significant influence on the child's intellectual development, where the stimuli provided can affect their learning abilities and growth in the future.

Teachers face various phenomena or challenges related to teaching and learning activities for early childhood. These include children having

low concentration during learning, showing little interest in following teacher activities, playing alone without paying attention to the procedural aspects of teaching and learning, and not actively listening to information provided by the teacher. Several factors contribute to this issue, such as inappropriate strategies and methods, unengaging teaching practices, and a lack of variety in learning resources and facilities (Wulansari & Sugito, 2016). The reality in early childhood education institutions in the city of Probolinggo shows that learners are unfocused, indifferent to the teacher, noisy by themselves, and show little interest in following the lessons delivered by teachers, caused by monotonous learning and a lack of supporting facilities used by teachers. Meanwhile, in meeting the needs for facilities such as the procurement of educational props, institutions are less capable due to limited financial conditions. To address this case, a new innovation is needed for teachers so that the problems that occur can be resolved.

The phenomena occurring in early childhood education institutions show that the learners are unfocused, less responsive to teachers, tend to be noisy, and less interested in the lessons delivered by the teacher (Fadlillah, 2023; Mundiri, 2019). This can be caused by monotonous learning methods and a lack of support tools or facilities used by teachers. In addition, educational institutions also face financial limitations that hinder the procurement of necessary educational equipment. To overcome this problem, new innovations in teachers' approaches to learning are needed (Buyamin, 2022; Mundiri & Sanafiri, 2022). This aims to solve the problems that arise in the teaching and learning process of early childhood. This innovation can involve the development of more engaging teaching methods, creative use of available resources, and solutions to overcome the financial limitations of institutions to meet the needs for better learning support facilities.

To address this issue, creative ideas are needed to provide resources that can stimulate students to focus more on their learning. Educational toys are tools specially designed to aid learning and can optimize child development, tailored to their developmental stage and age (Akhmad Shunhaji, 2020). Stimulating intelligence and enhancing language abilities and understanding in early childhood can be achieved by using

Educational Play Tools (APE) (Laila & Candraloka, 2019). Sulastri et al. (2017) stated that APE (Alat Permainan Edukatif or Educational Play Tools) are games that contain educational values which can be used as means or equipment in developing all the abilities of children. Arsana et al. (2019) suggested that learning should focus more on creating experiences for children using effective teaching methods through educational toys.

In addressing these issues, a creative idea is needed to fulfill the facilities capable of stimulating learners to be more focused on receiving education because educational toys are specially designed tools as aids for learning and can optimize child development, adjusted to the developmental stages and age of the child (Stimulating intelligence, as well as improving language skills and understanding in early childhood can use APE (Sulastri et al., 2017), which states that APE (Educational Play Tools) are games that contain educative educational values which can be used as a means or equipment in developing all abilities of children. Arsana et al. (2019) conveyed that lessons should focus more on forming children's experiences by providing effective learning methods through educational toys.

Educational props can be managed with recycled materials found around the school environment, this becomes a solution for institutions in minimal financial conditions (Hayati, 2019).. The selection of recycled materials needs to be sorted and chosen to be made into educational props, with the appropriate choice of materials being inorganic waste such as used bottles, plastic, paper, cardboard, cans, and so forth (Fadhila & Rakimahwati, 2020). The classification or types of organic and inorganic waste can be seen in the image below;



Figure 1. Types of Organic and Inorganic Waste

The selection of organic and inorganic waste facilitates the making and choosing of materials to be turned into educational props made from waste. The waste chosen for the training in making educational props is with the selection of inorganic waste. The advantages of educational props made from waste include 1) economical, not requiring a lot of money, 2) reducing environmental pollution, 3) easily obtained, 4) increasing creativity, 5) developing children's intelligence, among others (Zamroni et al., 2021). Utilizing household waste materials not only saves money but also helps preserve the environment. Uncontrolled waste disposal results in serious heavy metal pollution in water, soil, and plants (Ferronato & Torretta, 2019). Therefore, the use of recycled materials in Educational Play Tools (APE) can reduce pollution while producing affordable APE.

Thus, in the context of making educational props (APE), the choice of materials used is very important. This article mentions that in the APE-making training, inorganic waste is chosen as the main material. The advantages of using waste materials for APE are very diverse, including economic aspects with low production costs, contribution to reducing environmental pollution, availability of easily accessible materials, enhancing creativity in the development of props, and aiding in the development of children's intelligence. In this context, this activity is beneficial not only economically but also has a positive impact on the environment.

This empowerment and mentoring activity highlights the importance of utilizing household waste materials, not only to save money but also to help maintain environmental sustainability. It is conveyed that uncontrolled waste disposal can result in severe pollution to water, soil, and plants by heavy metals, according to Ferronato & Torretta (2019). Therefore, using recycled materials in making APE can be an effective way to reduce pollution while producing affordable educational props.

In early childhood education institutions in the city of Probolinggo, APE media made from waste materials include play tools made from recycled items such as colored bottles used to introduce colors or transformed into transportation tools for vehicle recognition. Used boxes are turned into number and letter cards, while cardboard is shaped into various patterns

to introduce geometric shapes. Old fabrics are transformed into plant and animal shapes, among others. The choice of waste materials is adjusted to the educational props needed by the institution, allowing for cost savings and efficient financial management.

2. Method

The service method uses the Asset-Based Community Development (ABCD) approach in the activity which emphasizes the use of local resources available in the community as the main foundation (Afandi et al., 2022). This approach starts the service process by identifying and utilizing the strengths and potential within the community, rather than focusing solely on needs and deficiencies. In this context, the mentoring activities using ABCD aim to motivate and empower the community in the City of Probolinggo to creatively use waste as material to produce environmentally friendly educational props (APE). ABCD enables the community to actively participate in the decision-making process, creation, and implementation of ideas in the making of APE. This approach provides an opportunity for the community to manage the potential of resources owned to become a solution in building innovative and environmentally friendly educational props. Furthermore, ABCD also encourages collaboration among community members, teachers, and other relevant parties in planning, developing, and implementing this mentoring program, making it an integral part of sustainable educational development.

The strategy for mentoring the development of educational props made from waste consists of; appreciative interviews, asset mapping, asset mobilization, action plan and activity preparation, and monitoring and evaluation. To realize the implementation of training for strengthening teachers' competencies in making educational props made from waste in early childhood education institutions, the stages are as follows; 1) Preparation stage; at the preparation stage, the community service team (PKM) conducts observations, initial data collection, knowing the condition of the service location to find solutions from the facts that occur. Then, the community service team (PKM) visits early childhood Islamic education institutions in the city of Probolinggo and provides

information and socializes the training program for making educational props from waste and determines the training implementation time. This mentoring activity is limited to early childhood education institutions in Kedopok Subdistrict, Probolinggo City, which has 40 early childhood education institutions ranging from playgroups to kindergarten. The mentoring process is divided into two locations to maximize the mentoring process. Thus, at each mentoring location, the participants consist of 20 early childhood education institutions represented by one teacher each; 2) Training implementation stage (field practice); After the information is conveyed to all components of the early childhood Islamic education institutions in the city of Probolinggo, the community service team (PKM) conducts training in the institution. Activities include material counseling, training on making APE from waste, demonstration of using APE from waste, and the trial stage for the students; and (3) Evaluation Stage.

3. Result

The implementation of mentoring to strengthen teachers' competencies in developing educational props made from waste at early childhood education institutions in Probolinggo city is carried out as follows:

a. Service Location Survey

In this case, the Community Service Team (PKM) conducts a survey at the service location. The survey was carried out on October 17, 2023, by reviewing characteristics, local wisdom, environmental conditions, and the condition of early childhood education institution locations in the city of Probolinggo. From this survey, it was found that several early childhood education institutions in the city of Probolinggo are under the auspices of the prosperous Islamic education foundation. Their rapid development, due to the persistence and diligence of the institution's components in socializing with the surrounding community, has led to significant progress over the years, both in terms of quality and the number of students.

The facts occurring in several early childhood education institutions in the city of Probolinggo show that learners are not focused,

indifferent to teachers, noisy on their own, and lack interest in following the lessons delivered by teachers due to monotonous learning and a lack of supporting facilities used by teachers, causing learners to tend to get bored. Meanwhile, in meeting the needs of facilities such as the provision of educational props, the institution is less capable due to limited financial conditions. This was known from the initial observations when the Community Service Team (PKM) arrived at one of the private early childhood education institutions and from interviews with 6 teachers on October 17, 2023. Seeing the potential that can be utilized with the facts on the ground, the Community Service Team (PKM) took the initiative to provide counseling to teachers of early childhood education institutions in the city of Probolinggo who have the problem of the absence of educational props.

b. Planning and Making APE Replicas

This strategy is a continuation of the previous process aimed at improving teachers' competencies in stimulating the growth and development of students. The planning for making Educational Props Made from Waste was carried out on October 23, 2023. From the planning, educational props (APE) were made by utilizing waste materials available in the school environment such as cardboard, used bottles, cans, and plastic as the main materials in making replicas of educational props (APE). The selection of these waste materials was made because one of the mentoring locations chosen as the locus of mentoring activities is close to the community environment, where there is sorting of organic and inorganic waste that can be utilized by the institution as the main material in making educational props (APE). The sorted waste materials will be processed into educational props (APE) in the form of several replicas that will later facilitate students in understanding the content present in the educational props (APE). Some of the educational props (APE) produced from used materials such as transportation tools, rainbow bowling, house replicas, and others as seen in the image below:



Figure 2. Educational Props (APE) Made from Waste

To determine the effectiveness of the plan for making educational props (APE), the Community Service Team (PKM) first created it as an initial example of replica creation. Initially, the Community Service Team (PKM) made transportation tools as a support for teaching and learning activities with a theme on transportation, specifically land transportation, made from cardboard. The first step involved providing the materials that would be used in the creation of the transportation tools (cardboard, glue gun, ruler, marker, scissors, pencil, eraser, cutter).



Figure 3. Tools for Making Land Transportation

The step described above is followed by the second step, which involves making patterns adjusted to the desired car design, starting with drawing the door patterns on both the left and right sides using a pencil or marker. After the pattern is drawn, it is then cut out using scissors or a cutter. Next, create a pattern for the front windshield using a marker or pencil, and carefully cut it out using a cutter or scissors. For small parts of the car such as side mirrors, wheels, etc., you can create patterns using other pieces of cardboard. Once the patterns are drawn,

they are cut out slowly to ensure a neater result. Cutting out the small parts of the car like the side mirrors and wheels requires extra precision and high concentration to achieve a tidy result. The tools used for cutting patterns include scissors or a cutter, and a ruler is also used to ensure maximum accuracy and consistent size.



Figure 4. Assembling the Transportation Tool Pattern

The third step is assembly. For this part, the tools and materials needed are tape or glue. You can use tape or glue to assemble the side mirrors, wheels, and other small parts of the car to be attached to the car shape you've previously formed.



Figure 5. The APE of Transportation Tool

The next educational prop (APE) is creating a rainbow bowling game. Rainbow bowling helps stimulate learners in 6 aspects of development: firstly, religious and moral values; learners pray before engaging in the game activity. Secondly, cognitive development; learners can recognize colors, numbers, and quantities. Thirdly, motor development; learners can move their body parts through the use of gross and fine motor skills in bowling the rainbow ball. Fourthly, language; learners are stimulated to communicate with friends and teachers while playing the bowling ball. Fifthly, social-emotional development; learners learn discipline

and patience while waiting in line for the game. Sixthly, artistic development; learners can understand artistic creations by producing rainbow bowling art pieces.

c. Training Preparation

The Community Service Team (PKM) visited the early childhood education institutions, which were the focus of the mentoring, to convey information about the training program on Thursday, October 20, 2023. Meanwhile, the dissemination activities were conducted on October 26, 2023, and after completing the dissemination, training was conducted from October 27, 2023, to November 11, 2023, in a scheduled manner. During the visit to the mentoring location, the Community Service Team (PKM) also informed about the used items and equipment that needed to be prepared to make APE, such as used cardboard boxes, plastic bottles of the same size, large markers, small markers, glue sticks/double tip glue, ruler, cutter/scissors, and colorful paint.

d. Program Evaluation

Program evaluation is the measurement and enhancement of activities, such as comparing the results of activities before and after the implementation of the program (Aliwar, 2016). Evaluation becomes a process of data collection, analysis, interpretation, and decision-making (Uswatun et al., 2022). Evaluation can be done in various aspects, including assessing the level of stimulation through educational props in early childhood education. The evaluation is implemented to observe the understanding of the learners during the learning process with the goal that through institutional evaluation, plans can be developed to achieve the desired objectives. The results of the evaluation are intended to be replanned and used for final administration and management.

In conducting the evaluation, the teachers at early childhood education institutions in Probolinggo City use small notes called anecdotal records. These anecdotal records present findings and field conditions related to the implementation of teaching by teachers. From the evaluation results, several issues were found. Firstly, learners were

not focused, played alone, and did not pay attention to the teacher, so the stimulation provided by the teacher was not received optimally. The second issue was the inadequate financial resources of the school to provide facilities and infrastructure, both in terms of media facilities and teacher competence enhancement facilities. Therefore, the school components must collaborate to find solutions to overcome the existing disparities.

The Community Service Team (PKM) provided a solution by using educational props (APE) made from waste materials to address the disparities in the institution. The team conducted dissemination about the benefits of using APE and the utilization of waste as the basic material for making educational prop media (APE). Subsequently, the team strengthened the teachers' competencies by organizing training on making APE from waste materials, which was appreciated by all stakeholders in early childhood education institutions who enthusiastically participated in the training until they were able to produce the media and apply it effectively.

With the implementation of mentoring to enhance the competencies of early childhood education institution teachers, they have become more enthusiastic and confident in nurturing the innovative and creative future generations of the nation. The institution's future plans will be more consistent in stimulating learners using various media, including educational props made from waste materials (APE). Based on the statement of the school principal, who mentioned that appropriate input stimulation will also produce appropriate output, the strengthening of human resources competencies within the institution is crucial. These enhancements can bring forth innovative and creative ideas. This serves as an evaluation for us to further enhance human resource competencies by conducting continuous training, as done by the Community Service Team (PKM). The innovations and creativity gained from the training will be continued to improve the learning methods at the mentoring site.

Studies related to community service relevant to this mentoring activity have not been widely conducted by other mentoring implementers. The identification of reports and articles on community service only shows

mentoring activities on the making of educational props (APE) as done by Rahmah et al. (2022), Mujtahid (2020), Akhmad Shunhaji (2020), dan Hasanah (2019). However, these articles or reports do not specifically focus on waste as an instrument that can be used as a media material. The mentoring activities carried out by other community service implementers were done using the Participation Action Research (PAR) method in the form of partnership training programs and mentoring. The stages of these activities were carried out through the process of mapping, preparation, implementation, and follow-up. Thus, the implementation of community service has similarities with the mentoring process conducted.

Additionally, Kumala, Hafiz, et al. (2022) conducted mentoring themed on creating educational props for the Fiqih subject. This mentoring could create new knowledge for educators, as evidenced by the emergence of teachers' abilities in making educational props from flannel fabric. Meanwhile, Erlina et al. (2022) conducted activities on developing 3D props based on Eco-Friendly, using a project-based online learning approach. Participants in this training were prospective Natural Sciences teachers, enabling them to develop eco-friendly based educational props. This had an impact on the creativity of teachers, lecturers, or even parents in understanding the subject matter. Matur Rahmi et al. (2023) also revealed that many kindergarten teachers lack the necessary skills and competencies as mandated by the law. This is due to academic qualifications and the ability of educational institutions to meet and stimulate the professionalism of educators. Based on this, mentoring activities and training in making educational props were conducted for educators.

Meanwhile, Lena et al. (2021) in their community service article on training for making educational props based on a scientific approach showed a mentoring process conducted with a service learning approach, which is different from the approach used in this community service. The training activities involved mentoring and demonstration by the community service implementers. The community service results conducted by Oktradiksa & Aufa (2019) also revealed that after an approach through socialization on the importance of educational props, teachers could create them. This led to an improvement in teachers'

teaching abilities, making teaching more engaging and keeping students engaged in class. Additionally, educators were also asked to disseminate the results of their work on making educational props. In this aspect, educators were indirectly required to think creatively by utilizing materials with the lowest economic value but having the same usefulness as other materials.

Rangkuti et al. (2019) explained in their community service results that the problems faced by the mentored partners, such as a lack of knowledge about innovative learning and the inability to create educational props, were factors causing the low quality of education. Therefore, the mentoring process carried out through training and guidance could result in outcomes such as the improvement of teaching skills among educators, as evidenced by pre-test and post-test evaluations, as well as the availability of thematic educational props for elementary schools. Kumala, Arifa, et al. (2022) specifically focused on mentoring in creating educational props for the Tan Gan Hijaiyah doll. The purpose of this activity was for participants to have the ability to create educational props of the Tan Gan Hijaiyah doll using flannel fabric.

The results of the above community service show similarities in terms of mentoring in making educational props. However, these community service results have not yet addressed the issue of the limited financial capabilities of Islamic early childhood education institutions, which typically have financial constraints in operating their educational institutions. These limitations also affect the ability of educators to create effective and efficient educational props. Thus, this mentoring activity aims to strengthen the skills of educators in creating educational props from waste materials, which have not been widely utilized as an added value in the learning process, especially at the early childhood education level.

Professional competence is crucial for organizations, including teachers in the context of schools. Professional competence has been proven to enhance teacher performance (Amalia & Saraswati, 2018), work productivity (Mundiri, 2016; Nisa, 2020), work effectiveness (Huda et al., 2020; Rozi & Kamalia, 2023), and student learning achievements (Andriani et al., 2018). Therefore, professional competence is essential for schools,

which has implications for the quality of school graduates and the quality of education. This indirectly confirms that the professional competence of teachers can be a prerequisite for a nation's human resources. Indonesia's Human Capital Index (HCI) as of March 2020 (excluding the impact of the COVID-19 pandemic) was 0.54, placing Indonesia at 87th out of 174 countries. Indonesia's Human Development Index (HDI) in the same year was even worse, ranked 111th out of 189 countries. The HCI and HDI may have been triggered by the professional competence of Indonesian teachers in previous years.

Conceptually, competence refers to a set of interconnected knowledge, skills, and abilities needed by individuals, teams, or organizations for effective performance (Hellriegel & Slocum Jr, 2011). Professionalism in the teaching context refers to meeting standards related to specific skills in education (Goodwin, 2021). Thus, competence reflects a series of functions, tasks, and responsibilities in the field of education based on skills acquired through specific education and training provided in the workplace (Saguni et al., 2021). Grady et al. (2008) stated that a professional individual not only actively hones their decision-making skills related to their expertise but also earnestly strives to develop their professional capacity. A professional educator will be deemed competent when they act responsibly and work effectively according to performance standards.

Glickman et al. (2017) identified stages of professional development through three learning steps: orientation, integration, and refinement. In line with the above opinion, Mulder (2014) argued that professional competence is the generic, integrated, and internalized ability to achieve sustainable performance effectively (including problem-solving, innovation, and creating transformations) in a specific professional domain. In the context of education, especially teaching, professional competence is the mastery of diverse and extensive teaching materials (Epstein, 2002). Thus, the professional competence of teachers refers to the general characteristics that determine readiness and ability to carry out professional activities adequately, independently, and responsibly in a continuously changing social and professional environment, to be able to carry out professional activities permanently and support personality-

based self-development by understanding the social conditions of pedagogical activities (Orazbayeva, 2016). Makovec (2018) mentioned three indicators of teacher professionalism. Firstly, teachers are proficient in the subjects they teach, they study and update their knowledge about the subject matter. The second indicator relates to how teachers transmit their knowledge to students. The third indicator is pedagogical. The pedagogical indicator is closely related to instruction, interest in students' personal problems and dilemmas, solving educational and disciplinary problems inside or outside the classroom, and teachers' actions that are respectful, moral, firm, and consistent, both in the classroom and among colleagues.

By providing information about the benefits of early childhood development stimulation and the utilization of surrounding objects, including waste that is no longer useful, it provides insight and enlightenment to RA Perwanida teachers, especially to be more innovative and creative in involving all elements to create a conducive classroom environment. Teacher training and mentoring programs are programs carried out with the aim of becoming more professional, thus maximizing the learning process in the classroom (Atmaja, 2019). The teacher training and mentoring program conducted by the community service team includes planning, application, and evaluation techniques. These activities fall under the internal management of the school and are held to develop teachers' knowledge and skills competencies. Through the teacher training program, it is hoped that the capacity of their work will increase, leading to more productivity and improved quality of work in providing stimulation to students.

Training in strengthening teacher competence in making educational aids from waste materials at early childhood education institutions is conducted to provide education to teachers about the utilization of unused media that can also be used as educational aids. The training conducted by the community service team (PKM) proceeded smoothly and received positive responses from the components of the institution, thus ensuring that the goals of the mentoring could be effectively conveyed. This positive response is based on feedback received from participants in the mentoring program for creating educational aids. At the

end of the training activities, the mentoring team requested feedback from the teacher participants. Feedback from participants indicates that they feel more confident and motivated to implement sustainable practices in their classrooms and to share this knowledge with colleagues and the surrounding community. This training is expected to be a first step in integrating environmental education into the early childhood education curriculum in Probolinggo City, shaping a younger generation that is more aware and responsible towards the environment.

4. Conclusion

The mentoring conducted in the project of developing educational aids from waste materials at early childhood education institutions in Probolinggo City has proven to be a meaningful initiative. Through a series of stages, starting from site surveys to program evaluations, this mentoring provides concrete solutions to the problems faced by educational institutions. Site surveys identified several issues, including lack of student focus, lack of interest in learning, and financial limitations in procuring educational aids. With the planning and creation of replicas of educational aids from waste materials, the mentoring team provides a creative solution to facilitate more engaging and interactive learning. Through training, teachers are equipped with skills and knowledge in making educational aids, while program evaluations measure significant changes, such as increased student focus and enthusiasm from stakeholders towards the use of educational aids made from waste materials.

This mentoring makes a substantial contribution to improving teacher competence, creating a more diverse and engaging learning environment for students. Through this mentoring, not only are problems in the learning process identified, but concrete solutions are also provided. The use of waste materials as materials for educational aids has provided new opportunities in creating useful learning media. The positive response from institutional stakeholders is evidence that this program successfully provides relevant solutions to the problems faced by early childhood education institutions. With the increasing enthusiasm of teachers and students towards the use of educational aids made from waste materials,

this step shows great potential to provide sustainable positive impacts in improving the quality of education in Probolinggo City.

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6. References

- Afandi, A., Laily, N., Wahyudi, N., Umam, M. H., Kambau, R. A., & Rahman, S. A. (2022). *Metodologi Pengabdian Masyarakat*. Direktorat Pendidikan Tinggi Keagamaan Islam Kementerian Agama RI.
- Akhmad Shunhaji, N. F. (2020). Efektivitas Alat Peraga Edukatif (APE) Balok Dalam Mengembangkan Kognitif Anak Usia Dini Akhmad. *Block Caving – A Viable Alternative?*, 2(2), 1–30. <https://doi.org/10.1016/j.solener.2019.02.027>
- Aliwar. (2016). Penguatan Model Pembelajaran Baca Tulis Quran Dan Manajemen Pengelolaan Organisasi (Tpa). *Jurnal Al-Ta'dib*, 9(1), 21–37.
- Amalia, L., & Saraswati, T. (2018). The Impact of Competencies Toward Teacher's Performance Moderated By the Certification in Indonesia. *KnE Social Sciences*, 3(10). <https://doi.org/10.18502/ks.v3i10.3363>
- Andriani, S. D., Asriati, N., & Syahrudin, H. (2018). The influence of professional competence and self-efficacy teachers' on student achievement in economic learning. *International Journal of Academic Research and Development*, 3(3), 282–285.
- Arsana, I. W., Anggreni, M. A., & Patriani, S. R. (2019). Pemanfaatan Benda-Benda Bekas Sebagai Alat Permainan Edukatif (Ape) Untuk Anak Usia Dini. *Journal of Chemical Information and Modeling*, 3(1), 17–30.

- Atmaja, H. T. (2019). Pelatihan dan Pendampingan Pembuatan dan Pemanfaatan Media Audio-Visual Interaktif dalam Pembelajaran Sejarah yang Berbasis pada Konservasi Kearifan Lokal Bagi MGMP Sejarah Kabupaten Banjarnegara. *JURNAL PANJAR*, 1(2), 131–140.
- Buyamin, B. (2022). Utilization of Information and Communication Technology in Optimizing the Quality of Public Relations at Schools Based on Pesantren. *Journal of Research in Educational Management*, 1(2), 113–121.
- Epstein, R. M. (2002). Defining and Assessing Professional Competence. *JAMA*, 287(2), 226. <https://doi.org/10.1001/jama.287.2.226>
- Erlina, N., I Wayan Sukra Warpala, & Putu Prima Juniartina. (2022). Pengembangan Alat Peraga 3D berbasis Eco-Friendly melalui Project Based Online Learning untuk Meningkatkan Kreativitas Ilmiah Calon Guru IPA. *Jurnal Pendidikan Dan Pembelajaran Sains Indonesia (JPPSI)*, 5(2), 177–186. <https://doi.org/10.23887/jppsi.v5i2.52785>
- Etivali, A. U. Al, & PS, A. M. B. K. (2019). Pendidikan Pada Anak Usia Dini. *Jurnal: Penelitian Medan Agama*, 10(2), 212–237.
- Fadhila, O., & Rakimahwati, R. (2020). Limbah daur ulang dapat meningkatkan kreativitas anak di taman kanak-kanak. *Jurnal Pendidikan Tambusai*, 4(1), 445–452.
- Fadlillah, F. (2023). The Training on Quizizz as a Learning Media for Elementary School Teachers. *GEMEINSCHAFT: Journal of Social and Community Engagement*, 1(1), 1–10.
- Ferronato, N., & Torretta, V. (2019). Waste mismanagement in developing countries: A review of global issues. *International Journal of Environmental Research and Public Health*, 16(6). <https://doi.org/10.3390/ijerph16061060>
- Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2017). *Supervision and Instructional Leadership*. Pearson.
- Goodwin, A. L. (2021). Teaching standards, globalisation, and conceptions of teacher professionalism. *European Journal of Teacher Education*, 44(1), 5–19. <https://doi.org/10.1080/02619768.2020.1833855>

- Hasanah, U. (2019). PENGGUNAAN ALAT PERMAINAN EDUKATIF (APE) PADA TAMAN KANAK-KANAK SE-KOTA METRO. *AWLADY : Jurnal Pendidikan Anak*, 5(1), 20. <https://doi.org/10.24235/awlady.v5i1.3831>
- Hayati, Z. (2019). Penggunaan Alat Permainan Edukatif (Ape) Dari Botol Plastik Dan Koran Bekas Untuk Meningkatkan Kreatifitas. *AWLADY : Jurnal Pendidikan Anak*, 5(1), 56–79.
- Hellriegel, D., & Slocum Jr, J. W. (2011). *Organizational Behavior*. South-Western Cengage Learning.
- Huda, H., Soeod, R., & Sjamsir, H. (2020). The Effect of Professional Competence on the Work Effectiveness of State Vocational School Teachers in Samarinda-East Kalimantan Huda. *Journal of Research in Humanities and Social Science*, 8(8), 24–29.
- Kumala, S., Arifa, T. R., Ansari, M. I., & Jumiati, J. (2022). Pelatihan Dan Pendampingan Pembuatan Alat Peraga Edukatif Botanhi (Boneka Tangan Hijaiyah) Pada Tim Penggerak Pkk Desa Sungai Gampa Kecamatan Rantau Badauh Kabupaten Barito Kuala. *Al-Khidma: Jurnal Pengabdian Masyarakat*, 2(1), 34. <https://doi.org/10.35931/ak.v2i1.1001>
- Kumala, S., Hafiz, A., Ansari, M. I., Arifa, T. R., & Jumiati, J. (2022). PELATIHAN DAN PENDAMPINGAN PEMBUATAN ALAT PERAGA EDUKATIF PADA MATA PELAJARAN FIQIH DI MI PLUS AL FALAH SUNGAI LULUT BANJARMASIN TIMUR. *Jurnal Vokasi*, 6(3), 206. <https://doi.org/10.30811/vokasi.v6i3.3301>
- Laila, A. N., & Candraloka, O. R. (2019). Pemanfaatan Potensi Alam sebagai Alat Permainan Edukatif di PAUD Delima Jobokuto Jepara. *E-Dimas: Jurnal Pengabdian Kepada Masyarakat*, 10(1), 76–82. <https://doi.org/10.26877/e-dimas.v10i1.2883>
- Lena, H., Rukiyah, R., Syafdaningsih, S., Rantina, M., Utami, F., Karnita, A., Karnita, A., Munawaroh, A., & Munawaroh, A. (2021). Pelatihan Pembuatan Alat Permainan Edukatif Berbasis Pendekatan Saintifik bagi Guru PAUD di Kota Palembang. *Bubungan Tinggi: Jurnal Pengabdian Masyarakat*, 3(4), 332. <https://doi.org/10.20527/btjpm.v3i4.2480>

- Makovec, D. (2018). The teacher's role and professional development. *International Journal of Cognitive Research in Science Engineering and Education*, 6(2), 33–45. <https://doi.org/10.5937/ijcrsee1802033M>
- Matur Rahmi, A., Srianita, Y., & Kurniawan Chairul, A. (2023). Program Pendampingan dan Pelatihan Pembuatan Alat Permainan Edukatif Berbasis Manajemen Pembelajaran Matematika bagi Guru PAUD di Kecamatan Mustika Jaya Kota Bekasi. *Jurnal Pendidikan Tambusai*, 7(2), 7422–7427. <https://jptam.org/index.php/jptam/article/view/7404>
- Mujtahid, I. M. (2020). *Pendampingan Pengembangan Alat Peraga Edukatif Untuk Guru-Guru SD DAN PAUD di Pekanbaru Riau*. Universitas Terbuka.
- Mulder, M. (2014). *Conceptions of professional competence. In International Handbook of Research in Professional and Practice-Based Learning*. Springer.
- Mundiri, A. (2016). The Leadership of Headmaster In Building A Work Culture Based On Pesantren. *Improving The Quality of Education and Training Through Stengthening Networking*, 1–7.
- Mundiri, A. (2019). *Pengembangan Media Pembelajaran Pendidikan Agama Islam; Konsepsi, Konvergensi, dan Implementasi*. Pustaka Nurja.
- Mundiri, A., & Sanafiri, A. N. (2022). FINANCIAL MANAGEMENT BASED ON PESANTREN; CENTRALIZED VS DECENTRALIZED SUPPLY PROCESS. *Managere: Indonesian Journal of Educational Management*, 4(2), 2. <https://doi.org/10.52627/managere.v4i2.133>
- Nisa, W. (2020). The Contribution of Professional Competence through the Work Discipline and Performance to Teacher Work Productivity in Public Elementary School of Tabunganen Subdistrict, Barito Kuala. *Journal of K6 Education and Management*, 3(2), 149–157. <https://doi.org/10.11594/jk6em.03.02.06>
- Oktradiksa, A., & Aufa, M. (2019). PKU Bagi MI Muhammadiyah Rambeanak 2 Kabupaten Magelang, Melalui Alat Peraga Edukatif (APE). *Publikasi Pendidikan*, 9(3), 227. <https://doi.org/10.26858/publikan.v9i3.8616>

- Orazbayeva, K. O. (2016). Professional Competence of Teachers in the Age of Globalization. *INTERNATIONAL JOURNAL OF ENVIRONMENTAL & SCIENCE EDUCATION*, 11(9), 2659–2672.
- Rahmah, N., Nursyamsi, & Subhan. (2022). Pendampingan pembuatan alat permainan edukatif (APE) matematika bagi guru PAUD di Kelurahan Balandai Kota Palopo. *Transformasi: Jurnal Pengabdian Masyarakat*, 18(1), 137–153. <https://doi.org/10.20414/transformasi.v18i1.4345>
- Rangkuti, M. A., Manurung, I. F. U., Tarigan, N., Panggabean, D. D., Irfandi, I., Harahap, M. H., & Syah, D. H. (2019). Pendampingan Guru-Guru Sekolah Dasar Mendesain Pembelajaran Tematik Berbasis Alat Peraga Di Kecamatan Medan Helvetia. *Publikasi Pendidikan*, 9(3), 232. <https://doi.org/10.26858/publikan.v9i3.10296>
- Rozi, F., & Kamalia, S. (2023). CREATING POSITIVE LEARNING ENVIRONMENT THROUGH WORK-LIFE BALANCE BASED HUMAN RESOURCE DEVELOPMENT. *PEDAGOGIK: Jurnal Pendidikan*, 10(1), 1. <https://doi.org/10.33650/pjp.v10i1.5575>
- Saguni, F., Hamlan, H., & Gusnarib, G. (2021). The Adversity Quotient Between Teacher Professionalism on Student's Autonomous Learning. *Journal of Social Studies Education Research*, 12(3), 312–342.
- Sulastri, Y. L., Rahma, A., & Hakim, L. L. (2017). IbM Pembuatan Alat Permainan Edukatif (APE) Ramah Anak Bagi Guru Paud di Kota Bandung. *Jurnal Pengabdian Kepada Masyarakat*, 7(2), 84. <https://doi.org/10.30999/jpkm.v7i2.177>
- Trenggonowati, D. L., & Kulsum. (2018). Analisis Faktor Optimalisasi Golden Age Anak Usia. *Journal Industrial Servicess*, 4(1), 48–56.
- Uswatun, U., Suryani, L., Rohayati, Liza, M. El, & Saputra, N. I. (2022). Analisis deskriptif penerapan model pembelajaran bcct dalam mengembangkan kemampuan berpikir kritis pada anak usia dini. *Atthufulah: Jurnal Pendidikan Anak Usia Dini*, 3(26–36).
- Wulansari, B. Y., & Sugito. (2016). Pengembangan Model Pembelajaran Berbasis Alam Untuk Meningkatkan Kualitas Proses Belajar anak Usia Dini. *Jurnal Pendidikan Dan Pemberdayaan Masyarakat*, 3(1), 16–27.

Zamroni, Amir, & Saleha, L. (2021). Pengelolaan APE Berbahan Limbah untuk Meningkatkan Kecerdasan Kognitif Anak. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 5(2), 1382–1395.