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Research Article

Training on Thin Plate Welding (SMAW 1G) for Potential Employees

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Abstract

Childhood is a time when children learn through play, so it is essential to provide opportunities for them to play and experience learning through play. Kindergarten is a place for early education, intertwined with messages for the child's growth and development. Besides being a playground, it can offer benefits that may not be widely known. For example, a slide helps develop children's gross motor skills, and indirectly, they learn to queue, which also trains their social and emotional skills. A merry-go-round encourages children to socialize with peers and become more independent. The seesaw introduces children to the concept of balance and weight. Lastly, swings and rocking chairs, among the children's favorite activities, teach courage and the ability to estimate time, which is related to cognitive development. The outdoor playground facilities at TK Kuncup Harapan are mostly made of carbon steel, making them an ideal target for this Community Service Program (PKM). This program is unique because mechanical engineering skills can be beneficial in early childhood education (PAUD). Collaboration between the Department of Mechanical Engineering and PAUD is not often seen, which motivates the organizers to be excited and optimistic about carrying out this activity. There are several methods to join carbon steel, including riveted joints, bolted joints, and welded joints. Welding is considered a cost-effective and widely used method, especially in construction and steel frame applications. Based on the importance of educational play equipment and the observed damage to the playground at TK Kuncup Harapan, this proposal has been prepared to address the needs of the school. The goal of this service is to maintain (repair and restore) the playground equipment that has been damaged and

is no longer usable. In addition to maintenance activities, this service will also provide basic welding training to potential teachers/staff so that any future issues involving carbon steel materials at the school can be resolved independently.

Keywords: training, welding, employees

INTRODUCTION

According to the National Education System Law No. 20 of 2003, children aged 0-6 years are the target age for early childhood education, aimed at stimulating and preparing children for the next educational stages. Kindergarten (TK) units are increasingly common today, with private kindergartens dominating at around 94.67%. In addition to private TKs, there are also Raudatul Athfal (RA) kindergartens, with 31,049 units under the Ministry of Religious Affairs (Nurhansah, 2023).

Childhood is a time when children learn through play, so it is essential to provide opportunities for them to play and experience learning through play. Kindergarten serves as a place for early education, intertwined with messages for the child's growth and development.

Children's play equipment can provide benefits that are often not widely known. For example, the slide helps develop children's gross motor skills and, indirectly, teaches them how to queue, which also enhances their social and emotional abilities. The merry-go-round encourages children to socialize with their peers and helps them become more independent. The seesaw introduces children to the concepts of balance and weight. Finally, swings and rocking chairs, which are among the children's favorite activities, help develop courage and the ability to estimate time, which is related to cognitive development.

Research suggests that play equipment can help develop children's abilities through improved fine and gross motor skills, as well as cognitive development, as noted by Pancaningrum in 2018 (Pancaningrum, 2018). Maintenance of facilities in various institutions is generally still suboptimal. Maintenance activities are not carried out systematically or continuously, as indicated by the frequent damage to facilities in many early childhood education institutions.

Munar (2023) argues that educational play equipment, as a support for teaching and learning, must be properly maintained through good management practices. This is done to ensure that the play equipment is ready for use at any time (Munar and Munastiwi, 2023).

METHOD

Location and Time of the Community Partnership Program (PKM)
The activities of this PKM are carried out at Kuncup Harapan Kindergarten (TK), located at Jl. Nikolas Kabes, Wagom Utara, Fakfak Regency, West Papua Province. The service program will be conducted from April to November 2024.

Stages of Improvement and Preparation

1. Initial Discussion
   An initial discussion with the partner was conducted to identify the main issues and gather all the information provided by the partner. The discussion began by asking why the kindergarten's play equipment was no longer in use, followed by identifying the main causes of this issue, and also determining the age of the play equipment. From the outset, it was evident that the partner was highly enthusiastic and eager for the play equipment at their school to be repaired and restored to full functionality.

2. Field Observation

   This stage requires the team, including the writer, to conduct an on-site observation of the facilities that are the focus of the community service project. Documentation is created during this stage as a reference for identifying the issues that need to be addressed.

3. Implementation

   The proposed solution is then presented to the partner for review and evaluation. Following this, a cooperation agreement is signed between the partner and the PKM team.

RESULT AND DISCUSSION

The results achieved in implementing the Community Partnership Program (PKM) are:

1. Coordination with the community and the principal of Kucup Harapan Kindergarten has been conducted, as well as a location survey for the partner group where the welding will be carried out. This activity is the initial coordination with partners.
2. In this case, the kindergarten principal has little hope that there will be a need for a memorandum of understanding on cooperation with the PKM implementation team so that the PKM implementation process can run effectively.
3. Through interviews with Kucup Harapan Kindergarten Management, an agreement was obtained regarding the implementation of the Community Partnership Program in the field of engineering technology related to the welding process.

Picture 1 Group photo

4. Due to the limited number of technicians in the field of welding repairs at Kucup Harapan Kindergarten, there are still many difficulties in carrying out welding, so there is a need for assistance in the form of scientific and technological contributions from the POLINEF institution.
5. Future prospects if the implementation of PKM POLINEF can be carried out well between partners and the POLINEF Institution so that this cooperative relationship can be developed further, especially in terms of developing welding maintenance and product manufacturing.
6. The management of this kindergarten still experiences many difficulties in welding and welding process procedures. To improve the quality of the construction of the Kucup Harapan Kindergarten children's play area, assistance is needed in the form of tools resulting from research by POLINEF lecturers.

Outcomes for PKM Activities
Preparation Process for the PKM Community Service Location
The table below is a preparation of tools and materials for PKM activities;

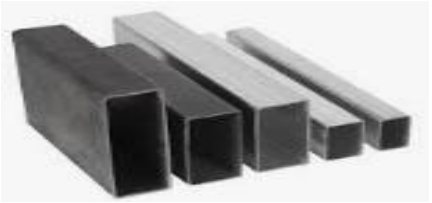
Table 1 Tools and Materials Used for SMAW Welding

No.	Tool Names and Their Functions	Physical Form
1.	One set of SMAW welding machine units for welding low carbon steel	
2.	Slag hammer is used to clean welding slag in SMAW welding.	
3.	Leather gloves are used as hand protection for the SMAW welding process.	
4.	Welding masks are used for eye protection during the SMAW welding process	

5.	Welding clamping pliers are used to adjust and clamp welding workpieces.	
6.	Precision elbows are used to measure the perpendicularity of the joint between the corners of the object to be welded	
8.	Hand drill machines are used to make holes for bolts and also as fasteners for kindergarten toy construction.	
9.	Hand grinders are used to finish welding results so that they look neat and are also used as cutting tools for toy frame constructions that are oversized.	
	The cable reel is used to connect the electric current flow from the electrical plug installation to the SMAW welding machine.	

	Welding aprons are used as a coating or body protector to avoid sparks from welding (flames) in SMAW welding.	

Table 2 Materials used to repair the construction of school toy frames Kucup Harapan Kindergarten

No.	Names of Ingredients and Their Functions	Physical Form
1.	Nikko steel electrode AWS E6013 Ø2.6 x350mm for under head welding	
2.	Hollow iron measuring 2x100x50x6000mm is used as additional material for construction replacement if there is a need for replacement.	
3.	Oil paint is used as a finishing after welding is complete to prevent corrosion and also to make it look beautiful.	
4.	The brush is used to polish the paint on the construction frame of the Kucup Harapan Kindergarten toy.	
5.	Thinner is used as a paint mixer that will be used for painting the construction of the Kucup Harapan Kindergarten toy so that it dries quickly.	

CONCLUSION

Below are some of the results that have been concluded in the context of the activities.SMAW 1G welding trainingfor PKM activities;

1. In order to carry out the Community Partnership Program activities, the PKM chairman has completed preparations for both the equipment and materials that will be used for the activities.SMAW 1G welding trainingfor repairing the construction of kindergarten toys so they can be reused and last a long time
2. The PKM Chairperson has coordinated with the Principal of Kucup Harapan School, where this coordination discussed determining the schedule and which location would be designated as the PKM location.
3. The PKM Chairperson agreed on the types of support that had been covered and provided during the PKM activities, including providing a welding guidebook in the form of an SOP module, 1 set of SMAW welding machines, welding support tools, K3 equipment and 5 kg electrodes as well as materials for the application of SMAW welding training.
4. After the repairs are carried out on the construction of the Kucup Harapan Kindergarten children's toys, finishing will be carried out by painting and also testing and inspection will be carried out using a visual inspection method on the welding results and a guarantee will be provided if anyone needs to learn more about welding.

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Pictures:

COMMUNITY SERVICE DOCUMENTATION