

Increased Knowledge of Lighting Installation, Hazards, And Electricity Use in Students of Kartika XIX-2 Junior High School Bandung

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ABSTRACT

This community service proposed an introduction to electrical installation systems and electrical security systems for households in accordance with PUIL 2011 standards and international standards that could be applicable to students of Kartika XIX-2 Junior High School Bandung in the form of workshops. From this activity, it is expected that a good relationship will be established between the Community Service Team (P2M) of the Polban Energy Conversion Engineering (JTKE) and partners so that the knowledge transfer process can be carried out continuously. Moreover, it is also expected that partners will get benefits and social impacts, as follows; increasing insight to the importance of good and correct electrical installation knowledge in accordance with PUIL 2011, fostering safe behavior/habits when performing electrical installation work, as well as gaining basic knowledge of electrical installation work that can be used to obtain a certificate of electrical installation expertise.

Keywords: *Electrical Installation, Protection, PUIL 2011.*

1. INTRODUCTION

Fire is one of the frequent accidents. A fire can occur if there are three elements, namely flammable materials, oxygen, and sparks. Based on data from the Fire Service, over the past 5 years there have been 4,244 fires, 2135 cases due to electrical short circuits (**Gunawan, 2019**) (**Aldi, 2022**) (**Kurniawan, 2021**) (**Muttaqien, 2020**). That means more than 50% of the total number of fire cases is caused by electricity. The biggest causes of fires are caused by lighting and electrical distribution systems, the use of household appliances such as water heaters, cooling and heating fans, and other causes (**Nasional, 2011**) (**Sayogo B, 2014**) (**sufiyanto A, 2016**). The electric lighting system that is the biggest source of causes of electrical fires can be caused by poor wiring systems, the use of electrical equipment that does not use applicable standards, and the use of piled terminals (**Mudawari, 2021**). Figure 1 and 2 shows statistics graph of fire causes and fire causes grouping.

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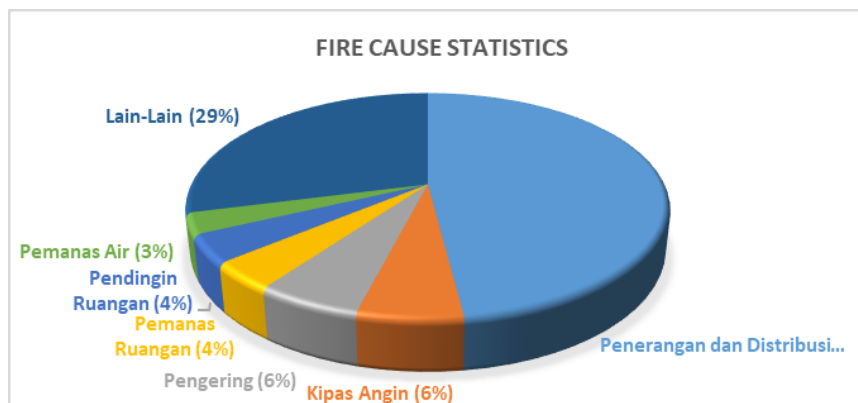


Figure 1. Statistics Graph of Fire Causes

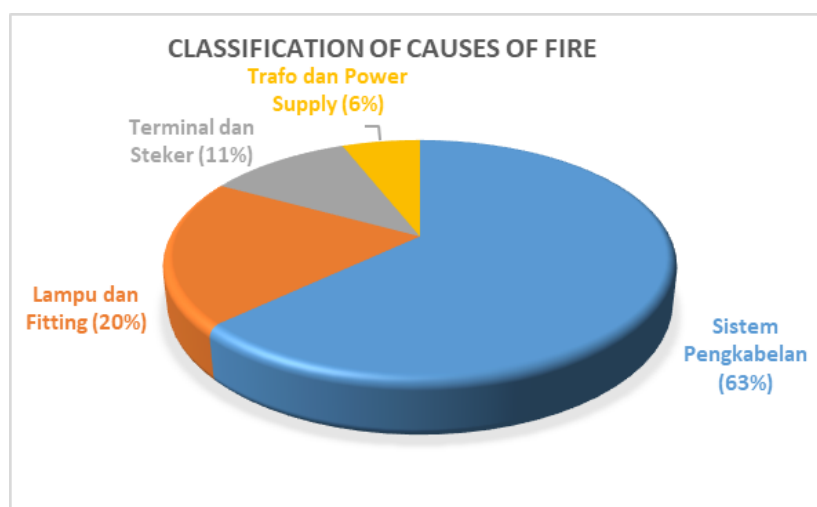


Figure 2. Graph of Fire Causes Grouping

Therefore, providing basic knowledge about electrical installation and protection to the public will be very useful. In order to socialize Law No. 30 of 2009 and the General Regulation of Electrical Installations (PUIL) 2011 to the public (Nasional, 2011) (Kepmenakertrans, 2007) (Mulyadi, 2011) (sufiyanto A, 2016), through the Community Service (PKM) program held at UPPM Polban, the Community Service Team (PKM) in the Department of Energy Conversion Engineering Polban will carry out Community Service (PKM) activities related to the theme of introducing lighting installations and hazards due to installations that are not in accordance with standards to Kartika XIX-2 Junior High School Bandung which addressed at Jl.Pak Gatot Raya No 73s KPAD Gegerkalong Bandung 40153.

As a results of the initial visit to Kartika XIX-2 Junior High School Bandung, it is known that there are several common problems that are obstacles to school development. The information was obtained through interviews with school management and direct review to various rooms in Kartika XIX-2 Junior High School Bandung. Among the common problems encountered are the following:

- 1) The location of Kartika XIX-2 Junior High School Bandung is united with Kartika XIX-2 Senior High School Bandung. The front of the building is occupied by the senior high school and the back of building is occupied by the junior high school. The interest of new students who want to go to school here is increasing every year. And this is an opportunity for the school to develop existing room facilities. However, this is

constrained by limited land, so government assistance cannot be taken (because assistance emphasizes more on adding space, not on expanding land.

- 2) In student counseling sessions, the teacher / homeroom teacher faces difficulties in communicating with parents / guardians of students, due to their busy work to make ends meet.
- 3) Kartika XIX-2 Junior High School Bandung has never received an explanation about lighting installations, electrical hazards and energy-saving behavior from competent parties.

2. IMPLEMENTATION METHOD

The implementation method that will be carried out on community service from the approach of the results of the analysis of the situation encountered and agreed upon by the Partner as a form of solution offered to the agreed partner as a solution that is carried out. In general, the stages of the implementation of its activities can be described in figure 3 below.

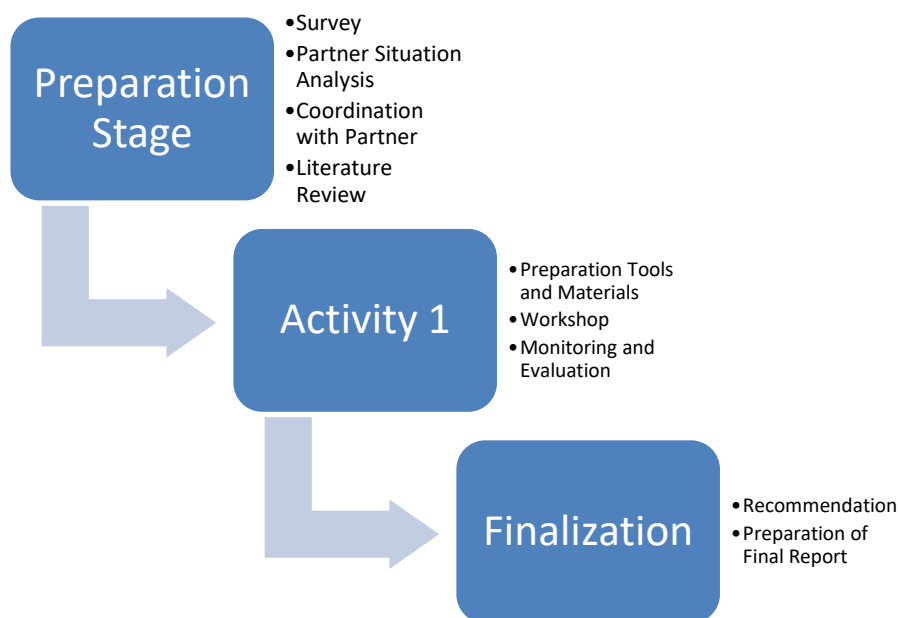


Figure 3. Methods of Implementing Community Service

3. RESULTS AND DISCUSSION

All stages of PKM activities, namely preparation, delivery of training materials, and workshops as well as reporting have been carried out properly and smoothly. In particular, to examine the success of training and workshops on lighting installations, hazards, and the use of electricity to the students of Kartika XIX-2 Junior High School Bandung to increase their understanding of general knowledge about electrical installation materials, electrical hazards and protection systems, as well as measurements of electrical quantities, an evaluation was carried out in the form of pre-tests and post-tests whose results can be shown in the graphic image below.

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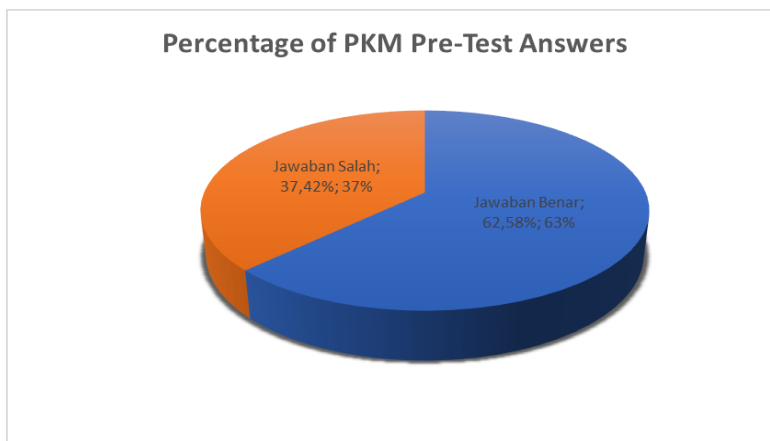


Figure 4. The percentage level of initial understanding before the training and workshops of students of Kartika XIX-2 Junior High School Bandung as a whole

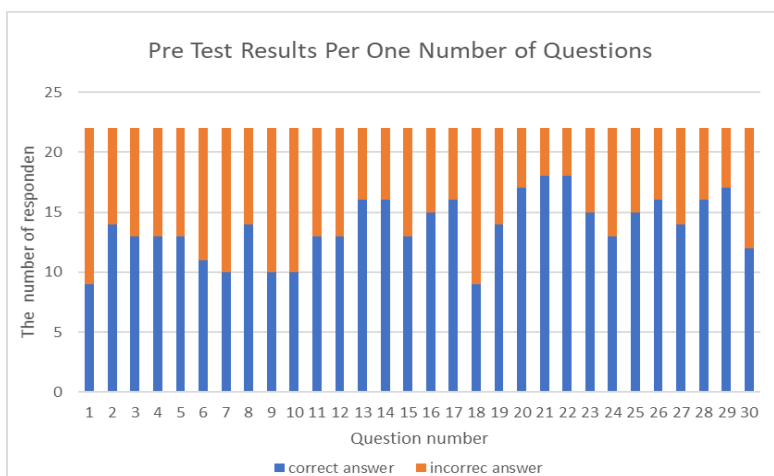


Figure 5. The level of the percentage of initial understanding before the training and workshop of students of Kartika XIX-2 Junior High School Bandung per one question number

As shown by the graphs in Figure 4 and Figure 5, before the training and workshop on lighting installations, hazards, and the use of electricity, the correct answers of all participants were around 62,58% with incorrect answers of about 37,42%. The number of students who took the pre-test was 30 people. When viewed from the correct answer per one question, it is known that the most correct answer is question number 21 and 22, where the question in question no.21, namely the measuring instrument used to measure electrical power consumption is the correct answer, namely the kWh meter, and the question on question no.22, which is shown a measurement from an analog Voltmeter measuring instrument, the question is how much is the measurement result on the measuring instrument displayed with the correct answer, namely all wrong. Furthermore, the post-test result data can be seen in the figure below.

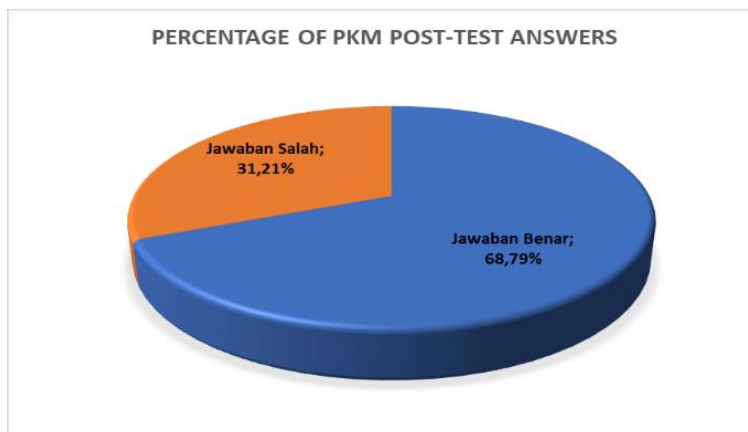


Figure 6. The level of the percentage of final understanding after the training and workshop of students of Kartika XIX-2 Junior High School Bandung as a whole

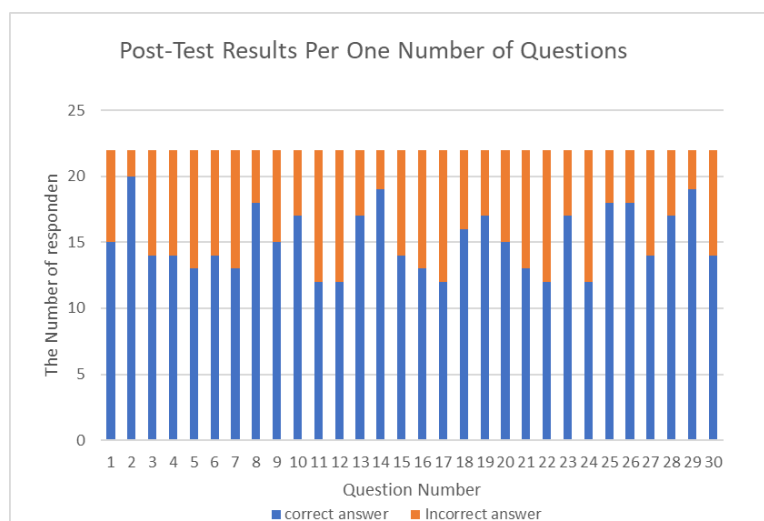


Figure 7. The level of the percentage of final understanding after the training and workshop of students of Kartika XIX-2 Junior High School Bandung per one question number

As can be seen in Figure 6, the graph shows the value of the post-test presentation or after training and workshops on lighting installations and the dangers of using electricity, with correct answers around 68.79% and wrong answers around 31.2%. There was an improvement in the results before the workshop and training. The increase was about 6.21%. In addition, in Figure 7, the graph designating the number of true and false per question, it can be seen that the correct answer is at most on number 2 and the wrong answer is the most on questions number 11 and 12.

In the implementation process, all participants participated in the entire series of events well with very high enthusiasm, as well as played an active role in every process such as during material workshops, joint discussions, and training on assembling prototypes of tools that have been made.

4. CONCLUSION

The workshop activities and training on lighting installations, as well as the use and hazards of electricity that have been carried out, it can be concluded that in general, students of Kartika XIX-2 Junior High School Bandung who take part in workshops and training activities have high enthusiasm and eagerness in understanding about lighting installations and the hazards and use of electricity, as evidenced by the full participation of participants in each series of training events held from morning to evening and the full enthusiasm of the participants in carrying out lighting installation practices.

Furthermore, from the results of the pre-test and post-test, it can be concluded that the understanding of training participants related to knowledge of lighting installation systems, as well as the use and hazards of electricity is increasing which is in line with the objectives of implementing PKM. With the increasing understanding of the lighting installation system and the use and hazards of electricity, it is expected that participants who are students of Kartika XIX-2 Junior High School Bandung who take part in this series of training activities can find out and understand how the lighting system is, avoid the occurrence of hazards that can be caused by the presence of electric current, and can use electricity as well as possible. Furthermore, with the cooperation that has been established with partners, namely Kartika XIX-2 Junior High School Bandung, it is expected that in the future training efforts can be carried out with deeper material and more participants to support intelligence efforts regarding electrical installations, as well as the uses and hazards that can occur in the electrical system, so that it can use electricity properly and can avoid the occurrence of hazards that may be caused by the presence of electric current.

Upon request from Partners, the plan for the next year service activities is to Increase Student Competence in the Field of Renewable Energy. In addition, seeing the interest of participants and the surrounding community and the ability of participants to absorb the material that has been delivered, then as an alternative to the next stage, this activity will again be carried out with a wider scope or target other participants in different places. So that people's understanding of electrical installations will increase.

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