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SOCIALIZATION OF THE PROCEDURE FOR USING THE LIGHT REFLECTOR TESTER IN SUPPORTING MOTOR VEHICLE TECHNICAL REQUIREMENT TESTING BASED ON ARDUINO NANO AT THE CARGO TERMINAL OF DINAS PERHUBUNGAN

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ABSTRACT
Pengabdian Kepada Masyarakat (PKM) activities aim to improve transportation safety by disseminating procedures for using Arduino Nano-based light reflector testers. This tool functions to test light reflector devices (APC) on vehicles, which are important in increasing vehicle visibility, especially at night or in bad weather conditions. Based on PM 74 of 2021, APC is required on motorized vehicles to support road safety. Studies show that APC can reduce the risk of accidents by up to 95% at night.This PKM activity was carried out at the Denpasar City Transportation Service Goods Terminal involving 35 participants. The stages of the activity include team formation, preparation of tools and materials, implementation of socialization, and evaluation. Counseling was carried out by conducting socialization, using brochures, and demonstration tools. The socialization was also followed enthusiastically and welcomed by the Denpasar City Transportation Service. The results showed an increase in the understanding of the examiners about the importance of using APC and its testing procedures, especially the test tools that had been made by students/I together with the supervising lecturer. This activity provides benefits in the form of increasing driver awareness of the risk of accidents without APC, as well as strengthening the implementation of transportation safety regulations. In addition, this activity also increases the insight of Bali Land Transportation Polytechnic students, especially the Automotive Technology study program, in applying their knowledge and skills for the advancement of society. The grant of the Light Reflector Tester test equipment to the Transportation Agency is expected to support the sustainability of motor vehicle testing in the future.

Keywords: reflectors; safety; service; vehicles

INTRODUCTION
Pengabdian Kepada Masyarakat (PKM) is an activity that benefits society by fostering and improving the quality of life safety (Aris Budi, 2021, n.d.). The use of reflective devices on vehicles plays a crucial role in ensuring road safety. According to PM 74 of 2021 Article 3 Paragraph (1), to enhance safety, in addition to safety equipment, motor vehicles other than motorcycles must be equipped with additional devices in the form of reflective devices (Teddy Rusmawan, 2010). With the increasing number of vehicles and transportation activities, the need for facilities supporting vehicle visibility, especially in dark conditions or adverse weather, is becoming more urgent. Efforts to meet technical requirements and ensure roadworthiness for each motor vehicle are carried out through periodic motor vehicle testing (Ermanto et al., 2023). Reflective devices are designed to reflect light from other sources, such as vehicle headlights, so that the vehicle remains visible to other drivers on the road. According to Schmidt-Clausen, the risk of accidents involving trucks and cars without reflective devices is 30 times higher. At night or during heavy rain and fog, drivers' visibility is often limited. In these situations, the presence of reflective devices on vehicles is very helpful. When the headlights of another vehicle hit the reflective device, the light is reflected

back, making the vehicle equipped with such devices easier to see. Research by the Technical University of Darmstadt showed that installing reflective devices on trucks could reduce nighttime collisions by 95%. After two years of study involving 1,000 vehicles, the results indicated a 41% reduction in rear-end collisions and a 37% reduction in side collisions (Yahya et al., 2020). Thus, the risk of collisions, especially involving vehicles that are stationary or moving slowly, can be minimized.

According to Government Regulation of the Republic of Indonesia Number 55 of 2012 on Vehicles, cargo vehicles are required to use reflective devices (APC). This regulation is designed to ensure that every vehicle, whether a car, motorcycle, or heavy vehicle, has clear and visible markings while on the road. Additionally, these devices are highly beneficial for cyclists and pedestrians, who are often in poorly lit areas. The use of reflective devices on vehicles is not merely about complying with regulations but also about ensuring personal and public safety on the road. With these devices, accidents caused by poor visibility at night or during adverse weather conditions can be minimized, fostering safer and more orderly traffic.

METHOD

The Community Service activity on the procedure for using a light reflector tester to support motor vehicle technical requirements testing, based on Arduino Nano, targets 35 participants for this socialization event. The initial step in this activity involved conducting research with faculty members to develop the light reflector tester tool according to field needs.

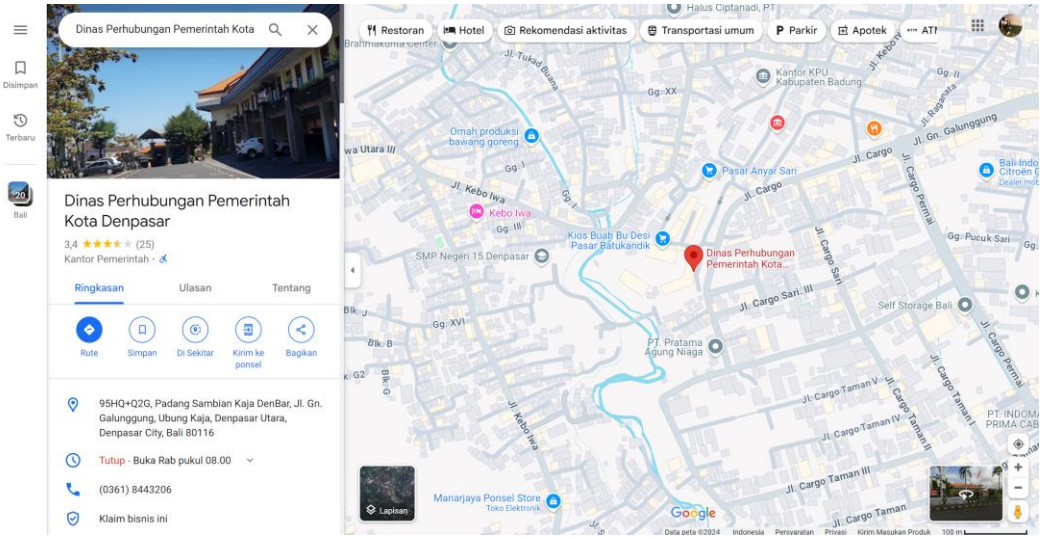

Figure 1. Map of the Location of the Activity Implementation by Dinas Perhubungan of Denpasar City

After obtaining approval, preparations for the equipment were carried out. The equipment prepared included: 1) Brochures; 2) Pamphlets; 3) Stickers. Once all activity preparations were complete, the event on the procedure for using the light reflector device was held on October 22, 2024, in Padang Sambian Village, Denpasar.After the activity concluded, data collection was conducted for evaluation and report preparation. The socialization method employed was the evaluation method (Laia, 2022). Knowledge was provided to the community through counseling aimed at improving understanding of the use of Reflective Devices on vehicles, as this can help reduce the risk of traffic accidents.

RESULTS AND DISCUSSION

Success of the Program

It is expected to provide the community with knowledge in recognizing and understanding the regulations on cargo loading to prevent accidents. There are several steps in this outreach activity, which include: team task distribution, preparation, campaign and socialization implementation, and evaluation. The team formation stage consisted of 4 cadets. During the preparation for the outreach activity, tasks were distributed, where the socialization was carried out by the cadets extemporaneously, assisted by lecturers. Subsequently, the evaluation activity was conducted by the lecturers, with the assistance of the cadets. The evaluation activities included direct checks on loading by cargo transport operators. Stickers were then affixed to the vehicles as a reminder of the evaluation.In the preparation stage, things necessary to support the socialization activity were prepared, such as event banners, pamphlets on the use of reflective devices, brochures, and automotive technology souvenirs.In this activity, pamphlets and brochures were created to be as attractive and informative as possible to capture the reader's interest and curiosity about the Reflective Device. This was intended to remind the community of the importance of using Reflective Devices.

Figure 2. Socialization Pamphlet on the Procedure for Using the Device

Figure 3. Socialization Banner of Pengabdian Kepada Masyarakat (PKM)

The factors contributing to the success of this PKM activity cannot be separated from both internal and external support. Internal support came in the form of the active roles of all lecturers and students of the Automotive Technology Class III at Poltrada Bali. During the preparation of the activity, the cadets played an active role in creating informative materials that were easy for the community to understand. Meanwhile, the lecturers were actively involved in providing supervision and guidance in the development of materials and tools by the cadets. Equally important, Poltrada Bali also provided support in the form of opportunities and financial allocation through P3M. The success of this PKM activity also owes much to the external support from the community of Padang Sambian Village, Denpasar, who enthusiastically welcomed the socialization event and assisted in the smooth running of the activity by providing basic information about the importance of using Reflective Devices.

Supporting Factors

Several supporting factors for the implementation of this PKM activity include: 1) a fund allocation of IDR 5,000,000 from the Poltrada Bali Budget; 2) the active role and enthusiasm of the Denpasar City Transportation Agency in the implementation of the PKM activity. The materials used in this PKM activity included brochures and pamphlets on the procedure for using the Light Reflector tester.

The Participation from Dinas Perhubungan of Denpasar City

The involvement of Dinas Perhubungan of Denpasar City in the PKM Socialization activity on the procedure for using the Light Reflector device included coordination with the head of Dinas Perhubungan regarding the importance of using Reflective Devices on vehicles.

The first stage began with an introduction session, which included:

1. Self-introduction
2. Introduction to the Politeknik Transportasi Darat Bali campus
3. Introduction to the campus program, specifically the Automotive Technology program.

During this stage, the purpose and objectives of the PKM socialization on the procedure for using the Light Reflector device were also explained. The second stage involved the socialization of the prepared material, where the contents of the brochures and pamphlets were presented directly to individuals, leading to interactive question-and-answer sessions between the cadets and Dinas Perhubungan of Denpasar City. This stage also included the distribution of souvenirs and a documentation session with Dinas Perhubungan of Denpasar City.

Figure 4. Socialization of the Procedure for Using the Light Reflector Device

Figure 5. Donation of the Light Reflector Device

Figure 6. Group Photo

CONCLUSION

The PKM activity "Procedure for Using the Light Reflector Tester in Supporting Motor Vehicle Technical Requirement Testing Based on Arduino Nano at the Cargo Terminal of Dinas Perhubungan" has been successfully carried out. Through this socialization, participants gained broader knowledge and insight into the importance of using Reflective Devices and the correct procedure for using the Light Reflector. This activity is considered successful in providing the community with the understanding and awareness of regulations according to the existing standards and procedures. The outcome of this activity is an increased awareness among drivers about the risks and negative impacts of not using Reflective Devices. This effort is expected to enhance road safety. This PKM activity also provided field experience for the cadets, particularly from the Automotive Technology program, to get closer to the community by sharing the knowledge and skills needed in everyday life. The donation of Light Reflector devices aims to optimize motor vehicle testing at Dinas Perhubungan of Denpasar City.

REFERENCES

Kusmagi, Marye Agung. Selamat berkendara di jalan raya. PT Niaga Swadaya, 2010.

Ermanto, S. A., Sasue, R. R. O., & Pradana, A. (2023). Threshold Berat Muatan Mobil Barang Dalam Hubungannya Dengan Jumlah Gaya Rem Pada Pengujian Kemampuan Rem. Jurnal Keselamatan Transportasi Jalan (Indonesian Journal of Road Safety), 10(1), 13–23. https://doi.org/10.46447/ktj.v10i1.556

Laia, B. (2022). Sosialisasi Dampak Kegiatan Kuliah Kerja Nyata Di Desa (Studi: Desa Sirofi). Haga: Jurnall Pengabdian Kepada Masyarakat, 1(2), 78–84. https://jurnal.uniraya.ac.id/index.php/HAGA/article/view/325

Yahya, S. A., Ramli, N. A., Shith, S., & Rasli, N. B. I. (2020). Assessment on Marking Specification of Rear Side of Heavy Goods Vehicles in Malaysia. International Journal of Research -GRANTHAALAYAH, 8(9), 283–295. https://doi.org/10.29121/granthaalayah.v8.i9.2020.1572

Paradita, P. (2022). Evaluasi Penerapan Alat Pemantul Cahaya Tambahan Dan Perisai Kolong Pada Kendaraan Angkutan Barang (Doctoral Dissertation, Politeknik Keselamatan Transportasi Jalan).

Kementerian Perhubungan Republik Indonesia. (2021). Peraturan Menteri Perhubungan Nomor PM 74 Tahun 2021 tentang Perlengkapan Keselamatan Kendaraan Bermotor. Jakarta: Kementerian Perhubungan.

Pemerintah Republik Indonesia. (2012). Peraturan Pemerintah Nomor 55 Tahun 2012 tentang Kendaraan. Jakarta: Sekretariat Negara.

Peraturan Menteri Perhubungan Republik Indonesia Nomor PM 74 Tahun 2021 tentang Perlengkapan Keselamatan Kendaraan Bermotor.

Peraturan Dirjen Perhubungan Darat Nomor KP.3996/AJ.502/DRJD/2019 tentang Alat Pemantul Cahaya Tambahan pada Kendaraan.

Peraturan Menteri Perhubungan Republik Indonesia Nomor PM 13 Tahun 2024 tentang Alat Pemantul Cahaya Tambahan.