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Know Before You Ship: Raising Awareness of Dangerous Goods Classification Through University Community Service in Manila

Devi Marlita[1*], Juliater Simarmata[2], Sarinah Sihombing[3], Euis Saribanon[4], Sri Handayani[5], Nursery Alfaridi Nasution[6]
[1-6] Institut Transportasi dan Logistik Trisakti - Jakarta, Indonesia

*Author's correspondence: dev.marlita@gmail.com**

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Abstract. *As shipping activities through various modes of transportation increase, the need for adequate understanding of dangerous goods is becoming increasingly important, especially among the younger generation. Unfortunately, many students still do not understand the classification and risks associated with transporting these goods. This community service activity aims to increase awareness and understanding of high school students in the Philippines regarding the classification of dangerous goods and the importance of safety in the shipping process. The activity was carried out through an interactive outreach method that included visual presentations, case studies, and simple simulations to make the material easier to understand and apply. The material provided refers to international standards, namely the International Maritime Dangerous Goods (IMDG) Code and ICAO Technical Instructions (ICAO-TI), which are important references in the classification and handling of dangerous goods globally. Evaluation was carried out through pre-tests and post-tests to measure the level of student understanding before and after the activity. The results showed a significant increase in students' ability to recognize symbols, types of dangerous goods, and initial actions to be taken when faced with these goods. These findings confirm that the right educational approach can increase early awareness among students as potential actors in the logistics chain. It is hoped that similar programs can be implemented widely and sustainably in various educational institutions to minimize the risk of sending dangerous goods due to a lack of public knowledge.*

1. INTRODUCTION

The rapid expansion of global logistics and transportation has led to a significant increase in the movement of goods across national and international borders. Within this framework, the transportation of hazardous materials plays a vital role and requires special attention. Dangerous goods refer to substances or items such as chemicals, flammable gases, radioactive materials, and explosives that, if improperly managed, can pose serious threats to human health, the environment, and property. Due to their inherent dangers, the transport of these materials is governed by strict international regulations, including the International Maritime Dangerous Goods (IMDG) Code for maritime transport and ICAO's Technical Instructions for the Safe Transport of Dangerous Goods by Air for air shipments.

Despite the regulatory complexity and the risks involved, public understanding of dangerous goods remains limited. Many people, especially students and younger individuals, lack the necessary knowledge to identify, classify, or handle such goods correctly. This knowledge gap is compounded by the absence of formal instruction on dangerous goods within

school curricula, making future generations vulnerable as they take on roles as consumers, logistics workers, or decision-makers in the supply chain.

This challenge becomes even more pressing with the rise of e-commerce and technology-driven shipping services that allow anyone to act as a shipper without prior logistics training. The convenience of courier services and digital marketplaces enables people to send goods easily, but often without understanding whether the items they are shipping are regulated. Everyday products like perfumes, lithium batteries, or certain cleaning agents are frequently mishandled because the senders are unaware they fall under the category of dangerous goods requiring special attention.

Furthermore, mishaps resulting from the unsafe transportation of hazardous materials are still occurring. Incidents such as cargo fires on airplanes, port terminal explosions, or chemical exposure affecting logistics workers have been reported in workplace safety records. In many cases, the root cause is a lack of knowledge or carelessness by the sender or frontline workers regarding the classification and safe handling of dangerous goods. For this reason, dangerous goods education should extend beyond professionals and be introduced early particularly at the school level to strengthen public safety awareness.

Delivering education on dangerous goods to high school students is a strategic move. Students in their final years are entering a crucial transition period where they begin to engage in work, higher education, or entrepreneurial activities like selling and shipping products online. Introducing them to the principles of hazardous materials management at this stage not only equips them with technical knowledge but also instills a sense of accountability when shipping items safely and legally.

This community service initiative employs an educational model that is interactive and student-centered. Rather than relying solely on lectures, the program integrates hands-on simulations and relatable case studies to make complex topics such as classification of dangerous goods easier to understand. The instructional content is based on IMDG and ICAO standards but tailored to suit the comprehension level of high school students. In addition, the learning approach emphasizes two-way engagement, encouraging students to ask questions and actively participate in discussions.

Beyond the transfer of knowledge, the broader aim of this initiative is to nurture critical thinking and responsible behavior related to shipping risks. Students are guided to consider why certain items, such as lithium batteries or chemical products, require specific packaging or why they cannot be transported alongside food or personal care products. This awareness

contributes to the prevention of future incidents and helps cultivate a long-term culture of safety and regulatory compliance from a young age.

This program also carries broader social benefits. In regions where enforcement of logistics safety standards is still developing and public awareness is limited, educational initiatives at the school level offer essential support to existing government and industry efforts. In the digital economy, safety literacy in supply chains must evolve alongside technological advancements. The success of a secure and dependable logistics network depends largely on the preparedness of human resources, especially younger generations, in mastering both the technical and ethical dimensions of goods handling.

Additionally, this initiative underscores the important role of higher education institutions in contributing to social progress, in line with the Tridharma Perguruan Tinggi, particularly in the area of community service. Universities are not only hubs of scientific and technological advancement but also have a moral obligation to translate knowledge into real-world benefits. This educational outreach on dangerous goods is a concrete example of how academia can support the development of a society that is more informed, responsible, and safety-conscious, especially in the field of sustainable logistics.

In light of these considerations, this community service program was developed with the core objective of enhancing student understanding and awareness of dangerous goods and their classification. This foundational knowledge is expected to prepare students not only as informed citizens who prioritize public safety but also as future contributors to or users of the logistics industry. Thus, the initiative is not simply informative; it seeks to bring about a lasting shift toward a culture of safety that starts in the classroom.

This community service activity holds significant urgency due to the rapid development of the logistics, transportation, and digital commerce sectors, which is not matched by a proportional increase in public literacy on safety in goods shipping. One of the most critical yet often overlooked issues is the understanding of dangerous goods items that, if improperly shipped or handled, can endanger human life, harm the environment, and cause substantial material losses.

The increasing use of courier services by the general public, especially among the youth, makes education on dangerous goods more vital than ever. Today’s younger generation, particularly high school students, is not only a consumer of logistics services but also an active participant in distribution systems through entrepreneurial online activities or digital transactions. However, they often lack sufficient understanding of the classification and risks

associated with dangerous goods such as lithium batteries, perfumes, spray paints, or chemical liquids. This poses potential unseen dangers, both to themselves and to others.

The absence of formal education on dangerous goods within the national school curriculum results in students not receiving the necessary information from an early age. On the other hand, higher education institutions have a strategic role in bridging this knowledge gap through targeted community service programs. Delivering outreach and training to students is a preventive measure that helps in still early awareness of the importance of identifying, understanding, and handling dangerous goods under safety standards and international regulations.

The urgency of this activity is further reinforced by the need to strengthen a safety culture within society. Many logistics-related incidents occur not due to a lack of regulation, but because of low public awareness and individual noncompliance with safety procedures. Therefore, shaping a safety-conscious mindset and social responsibility in students while still in school is a long-term investment in building a generation that is not only technologically and business-savvy but also mindful of legal and public safety aspects.

In addition, this initiative represents a concrete contribution from higher education institutions in fulfilling the *Tridharma of Higher Education*, particularly community service based on academic knowledge and expertise in transportation and logistics. Through an educational and interactive approach, this activity is expected to transform knowledge into sustainable and impactful collective awareness.

Thus, this community service program is not only relevant but also urgent, considering the increasing complexity of safety challenges in goods distribution in the era of digitalization and globalization. Early, well-targeted education for students is a tangible step toward reducing risks, improving human resource quality, and fostering a society that is safer, more responsive, and responsible in handling dangerous goods.

2. LITERATURE REVIEW

Dangerous goods are materials or items with specific chemical or physical properties that pose serious risks to human safety, property damage, or environmental pollution if not handled, stored, or transported properly. In the context of transportation, these goods cannot be treated like ordinary cargo due to their reactive, explosive, flammable, or toxic nature. Therefore, a specialized theoretical framework is needed to govern their classification, handling, packaging (Schlick-Hasper et al., 2022), labelling, and the regulations for transport across all modes: land, sea, air, and rail. According to international guidelines set out by the

United Nations Recommendations on the Transport of Dangerous Goods, dangerous goods are categorized into nine main classes: (1) explosives, (2) gases (compressed, liquefied, or dissolved), (3) flammable liquids, (4) flammable solids, (5) oxidizing substances and organic peroxides, (6) toxic and infectious substances, (7) radioactive material, (8) corrosive substances, and (9) miscellaneous dangerous goods not covered by the other classes. This classification is essential as a foundation for determining packaging methods, warning labels, shipping documentation, and emergency response procedures appropriate to the nature of each item. In practice, the handling of dangerous goods is governed by various international regulations, such as the International Maritime Dangerous Goods (IMDG) Code for maritime transport, the ICAO Technical Instructions (TI) and IATA Dangerous Goods Regulations (DGR) for air transport, and ADR (The European Agreement concerning the International Carriage of Dangerous Goods by Road) for road transport. In Indonesia, the management of dangerous goods is also regulated by national law, such as Government Regulation No. 74 of 2001 on the Management of Hazardous and Toxic Materials (B3).

The transportation of dangerous goods involves a range of risks that must be seriously mitigated. These risks include fires and explosions caused by flammable materials or pressurized gases, poisoning due to exposure to hazardous chemicals, environmental damage from spills of corrosive or radioactive substances, and transportation accidents caused by unstable or non-compliant cargo. To minimize such risks, proper implementation of safety management principles is crucial, including conducting risk assessments, fostering a strong safety culture, providing training and certification for involved personnel, and performing regular monitoring and audits to ensure regulatory compliance. In addition, proper labelling and the use of internationally standardized packaging are integral parts of managing dangerous goods transportation. The symbols and labels must convey clear and accessible information to all parties involved in the logistics process. In Line With Research From: (Tumoka, 2023), (Hermawan & Widana, 2024), (Rizaldy et al., 2018), (Rizaldy et al., 2024).

For the general public, especially younger generations like students, understanding the theory of dangerous goods is essential and should be instilled early as part of safety literacy and environmental awareness. The growing use of courier services by students or small online entrepreneurs is often not accompanied by sufficient knowledge about items considered dangerous, such as lithium batteries, perfumes, spray paints, or chemical cleaning agents. This lack of awareness can lead to incidents that endanger senders, couriers, and storage facilities. Therefore, educational approaches that address both theoretical and practical aspects of dangerous goods in transportation are highly relevant and necessary to introduce in schools as

part of preventive efforts and character-building that promote safety awareness. With this foundational understanding, students will be better prepared to navigate the realities of modern work and entrepreneurship, which demand not only product and market knowledge but also an understanding of legal responsibilities and social accountability for public safety. In Line With Research From: (Lasse & Himawan, 2020), (Susanto et al., 2021), (Singh & Singh, 2003).

3. RESEARCH METHODS

This community service activity was conducted offline in the Philippines over six days, from June 9 to June 14, 2025**,** with 80 participants consisting of vocational high school and technical college students with academic backgrounds in logistics, chemical engineering, and transportation. The implementation method adopted a participatory and educational approach aimed at improving participants' understanding of the classification and handling of dangerous goods under international standards. The program began with a pre-test on the first day to assess the participants' initial knowledge of hazardous materials, including their types, symbols, classifications, and basic handling procedures. On the second and third days, the materials were delivered through interactive visual presentations**,** covering the nine classes of dangerous goods based on the IMDG Code and IATA DGR**,** labeling practices, safety symbols, and the introduction of key documents such as the Safety Data Sheet (SDS)**.** The fourth and fifth days focused on labeling simulations**,** risk identification**,** and group discussions on real case studies, such as incidents involving flammable materials in sea and land transportation. On the final day, a post-test and evaluation session was conducted to measure knowledge improvement and assess the effectiveness of the program. Throughout the activity, facilitators monitored participant engagement and provided direct feedback. The entire program was delivered in English**,** in alignment with the international setting of the activity. This method was designed to provide an applied and collaborative learning experience while fostering critical awareness of the importance of safety and regulatory compliance in handling dangerous goods within the logistics and transportation sectors.

Figure 1. Community Service Activities

4. RESULT AND DISCUSSION

The community service program titled “Know Before You Ship: Raising Awareness of Dangerous Goods Classification Among Students” was initiated in response to the limited knowledge among students, particularly those in vocational high schools and colleges, regarding the classification and safe handling of dangerous goods in the fields of transportation and logistics. This understanding is critical, given the high risks associated with mishandling hazardous materials through improper packaging, labelling, or transport procedures.

Initial assessments through a pre-test revealed that the majority of students lacked familiarity with what qualifies as dangerous goods, how they are categorized under international guidelines such as the IMDG Code and ICAO/IATA DGR, and the relevance of using correct labelling and safety symbols. A common misconception identified among participants was the belief that commonly used household chemicals are inherently safe, even though many are officially classified as hazardous.

Using an engaging approach that included visual presentations, quizzes, labelling simulations, and group discussions, the program successfully deepened participants' understanding of the nine major classes of dangerous goods from explosives (Class 1) and gases (Class 2) to flammable liquids (Class 3) and radioactive substances (Class 7). Post-program evaluations showed a 45% average increase in student scores compared to the initial test, indicating significant learning outcomes.

Beyond theoretical knowledge, the program also highlighted the value of awareness and professional attitude in logistics. It emphasized that students, who are future professionals in air, sea, or land transportation, need to be mindful of the risks, legal implications, and public safety hazards that can result from improper handling of hazardous goods. Case studies and scenario-based learning helped contextualize these risks and responsibilities.

The program also familiarized students with key documentation practices, such as the use of the Safety Data Sheet (SDS), which is essential for the proper storage, handling, and shipment of dangerous goods. The high level of student engagement, evident from the number of questions posed and their active involvement in discussions, further illustrates their strong interest in the topic.

This activity contributed positively not just by enhancing students' technical knowledge but also by cultivating a greater sense of responsibility toward safety in the logistics chain. With a better grasp of dangerous goods classification, students are expected to carry this awareness into their studies and future careers, serving as advocates for safe logistics practices.

In conclusion, this community engagement effort confirmed the relevance and urgency of providing education on dangerous goods, especially for vocational students. It is recommended that further programs be developed to include more practical and certified training such as advanced handling techniques or emergency response simulations, to better equip students with the necessary industry-ready skills.

Discussion

This community service initiative stemmed from the need to enhance student comprehension of dangerous goods within the logistics and transportation sectors fields where these students are likely to pursue careers. Dangerous goods encompass substances that can pose significant threats to human life, property, and the environment when not managed in accordance with regulatory standards. Unfortunately, awareness and understanding of how these materials are classified and their specific hazards remain limited, particularly among students in vocational programs focused on logistics, chemical engineering, or transportation.

To address this gap, the program adopted an educational and interactive approach, delivering content based on the nine internationally recognized classes of dangerous goods, referencing guidelines such as the International Maritime Dangerous Goods (IMDG) Code and the International Air Transport Association (IATA) Dangerous Goods Regulations (DGR). Visual materials, hazard labels, and real-life case examples were used to make the sessions more engaging and relatable.

The program demonstrated a marked improvement in student knowledge. Before the session, most participants struggled to correctly identify various types of dangerous goods. However, following the training and group discussions, post-test scores improved by approximately 45%, indicating the effectiveness of the learning methods used.

Beyond imparting technical knowledge, the initiative also aimed to cultivate a deeper sense of responsibility among students regarding the handling of hazardous materials. Group discussions on real incidents such as chemical explosions during maritime transport helped students understand the severe consequences of mishandling, emphasizing the importance of proper labeling, packaging, and adherence to safety protocols.

An essential component of the program was the introduction of critical documents like the Safety Data Sheet (SDS). Students learned how to interpret SDS content and understand its role in guiding the safe storage, handling, and transport of hazardous materials. The program also highlighted the collaborative roles of various stakeholders—such as shippers, freight forwarders, transport operators, and regulatory agencies—in maintaining safety throughout the logistics chain.

The overall response from students was highly positive. Their enthusiasm and engagement suggested a strong interest in the subject, with many requesting similar training in the future and even proposing certified courses in basic dangerous goods handling. This response indicates a disconnect between current vocational curricula and the practical skills demanded by the logistics industry.

In conclusion, this initiative has proven that interactive, educational programs can significantly improve student awareness and understanding of dangerous goods. It serves as an essential starting point for fostering a culture of safety and accountability early in students' professional development. Moving forward, incorporating hands-on, certified training into educational pathways is recommended to better equip vocational students for real-world challenges in logistics and transportation.

5. CONCLUSION AND SUGGESTIONS

This community engagement initiative proved effective in enhancing students' knowledge and awareness regarding the classification and management of dangerous goods within the logistics and transportation industries. By utilizing an interactive and educational approach, participants developed a solid understanding of the nine categories of hazardous materials, the associated labeling symbols, crucial documentation such as the Safety Data Sheet (SDS), and the significance of global standards like the IMDG Code and IATA DGR. The notable improvement in post-test results compared to the pre-test outcomes demonstrates the success of the program in conveying essential information. Additionally, the strong enthusiasm displayed by students throughout the activity underscores the relevance and urgency of the topic, particularly for vocational learners aiming to pursue careers in the logistics sector.

Beyond delivering technical knowledge, the program also helped instill ethical awareness and a sense of accountability in handling workplace risks. These outcomes are vital in laying the groundwork for fostering a culture of safety and adherence to regulatory standards from an early stage in students' professional development. To ensure the sustainability and broader impact of this initiative, several strategic recommendations are proposed. First, the topic of dangerous goods should be integrated into vocational school and technical training curricula, either as a standalone subject or as an additional module within logistics and transportation courses. This integration will provide students with foundational knowledge early in their education. Second, hands-on and certified training, such as Basic Dangerous Goods Handling or Emergency Response Training, is highly recommended to equip students with industry-recognized competencies. Third, educational institutions are encouraged to strengthen collaboration with logistics companies and regulatory bodies like the Ministry of Transportation or the Customs Authority. Such partnerships can offer valuable field experience and real-world insights into dangerous goods handling procedures. Fourth, the development of digital learning media, including videos, interactive infographics, and virtual simulations, should be prioritized to enhance student engagement and facilitate independent learning. Lastly, continuous evaluation should be conducted to monitor the long-term impact of this program on students' attitudes and their readiness to meet the demands of the professional world.

REFERENCE

Hermawan, I. G. N. W., & Widana, I. D. K. K. (2024). Penerapan safety management system dan penanganan barang berbahaya di Yogyakarta International Airport. Jurnal Visionida, 10(1), 66-77. https://doi.org/10.30997/jvs.v10i1.13858

Lasse, D. A., & Himawan, T. (2020). Peningkatan penanganan pengangkutan barang berbahaya di bidang pelayaran. Jurnal Penelitian Transportasi Laut, 16(1), 9-17. https://doi.org/10.25104/transla.v16i1.1429

Rizaldy, W., Hidayat, D. R., & Chairuddin, I. (2018). Faktor penyebab mengendapnya barang berbahaya dan prosedur pemusnahannya di Terminal Kargo Bandara Soekarno-Hatta. Jurnal Manajemen Transportasi & Logistik (JMTRANSLOG), 4(3), 277. https://doi.org/10.54324/j.mtl.v4i3.156

Rizaldy, W., Lesmini, L., Chairuddin, I., Firdaus, M. I., & Widiyanto, P. (2024). Bimbingan teknis penanganan muatan dan limbah pada kereta melalui pedoman penanganan barang berbahaya. ADMA: Jurnal Pengabdian dan Pemberdayaan Masyarakat, 5(1), 133-144. https://doi.org/10.30812/adma.v5i1.3861

Schlick-Hasper, E., Bethke, J., Vogler, N., & Goedecke, T. (2022). Flow properties of powdery or granular filling substances of dangerous goods packagings-Comparison of the measurement of the angle of repose and the determination of the Hausner ratio. Packaging Technology and Science, 35(10), 765-782. https://doi.org/10.1002/pts.2678

Singh, S., & Singh, M. (2003). Explosives detection systems (EDS) for aviation security. Signal Processing, 83(1), 31-55. https://doi.org/10.1016/S0165-1684(02)00391-2

Susanto, P. C., Pahala, Y., Hartono, H., & Saroni, S. (2021). Proses handling barang berbahaya di bandar udara. Aviasi: Jurnal Ilmiah Kedirgantaraan, 17(1), 45-53. https://doi.org/10.52186/aviasi.v17i1.58

Tumoka, I. M. R. (2023). Faktor penghambat dalam pengawasan barang berbahaya di Kantor Kesyahbandaran dan Otoritas Pelabuhan Kelas I Sorong. Jurnal Governance and Politics (JGP), 3(1), 1-9.