

TRAINING ON MAKING AROMA THERAPY CANDLES FROM WASTE COOKING OIL FOR STUDENTS OF SMKN 4 BANJARMASIN

Salwa Aulia Risky, Asy Syaffa Raihana, Maulida Rahmah,
Puteri Yulia Nieta, Aminah, Lea Emilia Farida
Politeknik Negeri Banjarmasin
lea@poliban.ac.id

ABSTRACT

Used cooking oil, which is produced from the repeated use of cooking oil, contains hazardous compounds that can trigger serious illnesses and contribute to environmental pollution. In vocational schools, particularly those with culinary arts programs, used cooking oil is a common waste product generated from cooking practices. Often regarded as waste and discarded, used cooking oil can be recycled into valuable aromatherapy candles.

This community service initiative aims to educate the students of SMK Negeri 4 Banjarmasin about effective waste management of used cooking oil through training in aromatherapy candle making. In addition to raising environmental awareness, this activity enhances students' creativity by transforming waste into useful products.

The implementation method includes: (1) providing a lecture on the dangers of used cooking oil and its potential uses; (2) hands-on practice in making aromatherapy candles from waste oil; (3) discussion and Q&A sessions; and (4) evaluation through pre- and post-tests. Pre-test results indicated that 88.57% of participants had never made aromatherapy candles using used cooking oil. In contrast, post-test results showed a significant improvement in skills, with all participants successfully making aromatherapy candles from used cooking oil.

Keywords: Training, Recycling, Used Cooking Oil, Aromatherapy Candles.

i. INTRODUCTION

Cooking oil is a staple ingredient widely used in various cooking activities. However, if cooking oil is used repeatedly, more than three or four times, its quality will deteriorate, its color will change, and its fatty acid content will become more saturated. This altered oil is known as used cooking oil, which not only has negative health impacts but also has the potential to pollute water and soil. (Damayanti and Supriyatin, 2021).

Dangerous compounds, which are free radicals and are carcinogenic, are formed due to the repeated heating process of oil, such as trans unsaturated fats, peroxides, and hydroperoxides. (Yana, 2023). Consuming used cooking oil for a long time is very dangerous because of its high levels of saturated fatty acids, which can cause various serious health problems, such as coronary heart disease, stroke, hypertension, high cholesterol, and the risk of cancer. (Ardhany and Lamsiyah, 2018).

Used cooking oil disposed of directly onto the ground can clog soil pores and harden the soil structure (Hesti et al., 2022). Furthermore, used cooking oil waste also has the potential to disrupt the balance of aquatic ecosystems. Contaminated water experiences a decline in function, ultimately causing problems in the provision of clean water. (Rumaisa, Christy, and Hermanto, 2019).

Amidst growing concerns about environmental pollution from household waste, used cooking oil remains one of the most common yet often overlooked sources of waste. Until now, used cooking oil has been associated with waste from household cooking activities, particularly by housewives. However, in reality, educational settings, such as vocational schools, particularly those specializing in culinary arts, also generate used cooking oil waste through daily cooking practices.

In addition to their direct connection to waste sources, the 10th-grade students of the Culinary Department of SMK Negeri 4 Banjarmasin are also considered to have great potential to be introduced to the concept of environmentally friendly and useful waste management. As the younger generation and future culinary industry players, they are expected to become agents of change. Not only simply users of materials, but also innovators in waste utilization. Through training on utilizing used cooking oil into aromatherapy candles, this activity not only fosters environmental awareness but also instills an entrepreneurial spirit and creativity in creating economically valuable products from waste materials. Based on these conditions, we conducted a training activity on making aromatherapy candles from used cooking oil at SMK Negeri 4 Banjarmasin, located on street Brigjend H. Hasan Basri, North Banjarmasin District, Banjarmasin City, South Kalimantan Province as seen in Figure 1. Participants in this activity consisted of 35 10th-grade culinary students and were accompanied by seven teachers.



Figure 1. Location of State Vocational School 4 Banjarmasin

The training, which was carried out in this community service activity, aims to make the younger generation more aware of the importance of managing kitchen waste and provide new skills regarding processing used cooking oil waste into aromatherapy candles.

ii. METHOD

Some of the stages of the method we used in this service are as follows:

a) Survey to partner locations

This survey aims to determine the attitudes and behavior of school residents towards the management of used cooking oil so far, as well as to identify the potential for school participation in the used cooking oil collection and recycling program as part of the activities to be carried out.

b) Socialization

This socialization was carried out using the lecture method, namely delivering material directly to participants in the form of a structured oral presentation. Inayati and Dhanti (2021) and Aisyah *et al* (2020) also use the lecture method in community

service. Rinanti *et al* (2022) mention the extension method as their method of service.

c) Training in making aromatherapy candles

The hands-on training aims to provide participants with the opportunity to directly practice how to manage used cooking oil, ensuring that they gain not only theoretical knowledge but also practical experience. Hands-on work experience is crucial for gaining experience and developing students' skills. This type of training was also conducted by previous community service providers, resulting in aromatherapy candles. (Nuriskasari, Saputra and Nainggolan, 2022) (Rinanti *et al.*, 2022) (Inayati and Dhanti, 2021)(Aisyah *et al.*, 2020). Other services also include holding training/workshops, but produce a product in the form of solid soap. (Naulina *et al.*, 2023)(Agustine, Nurlatifah and Sujana, 2022) (Damayanti and Supriyatin, 2021).

d) Discussion and Q&A

This discussion and Q&A session was designed to reinforce understanding of the importance of managing used cooking oil. The teachers' interest in conducting similar activities emerged after witnessing firsthand the practice of making aromatherapy candles. This was evident in the numerous questions they asked during the discussion and Q&A session. They found the activity not only fun and creative but also beneficial. They were encouraged to try it again in the future..

e) Evaluation

Our evaluations consisted of pre-tests and post-tests using questionnaires completed manually by the students. The pre-test was administered before the training began to assess students' understanding of used cooking oil and their initial skills in processing it into aromatherapy candles. Students were given a post-test to assess their skill levels after the training concluded.

iii. RESULTS AND DISCUSSION

a) Survey to Partner Locations

Prior to the community service activities, we conducted a survey at SMKN 4 Banjarmasin. The first survey involved interviews with a teacher named Ms. Fitri and a culinary student representing the partner. We discussed the suitability of the activity concept, the desired objectives, and requested permission to conduct the activity at the school. Previously, the used cooking oil produced during the cooking practice had not been properly managed. The cooking practice was conducted daily, Monday through Friday, in the Cooking Practice Laboratory (PM), producing approximately 2 liters of used cooking oil per month.



Figure 2. Survey to Partner Locations

The second survey was conducted to submit the official permit from the Banjarmasin State Polytechnic (Poliban) requested by the partner. Next, we coordinated the activities via WhatsApp chat with Ms. Fitri. The survey was a preliminary step to ensure that the program concept aligns with the school's needs and has the full support of the partner.

b) Preparation of Tools and Materials

Before the training began, we first prepared the necessary tools and materials. This preparation was crucial because it determined the smooth running of the aromatherapy candle-making workshop. Several key ingredients, such as refined used cooking oil, palm wax, fragrance, dye, and candle wicks, were purchased online from Shopee, as it's more convenient and offers a wide selection at affordable prices. For the glass candle containers, the team conducted a face-to-face survey of several shops in the Banjarmasin and Banjarbaru areas to find the most suitable shape and size for their needs. This approach ensured that the containers used were not only functional (heat-resistant) but also attractive when converted into finished products. Initially, we planned to use used cans as a recycling concept. However, cans are poor heat conductors and less aesthetically pleasing, so we decided to use glass.

The first step in turning used cooking oil into aromatherapy candles is refining the used cooking oil. We collected 3 liters of used cooking oil from our respective kitchens. This process removes impurities, unpleasant odors, and any remaining harmful substances contained in the used cooking oil. For this activity, we'll need equipment such as a stove, a stirrer, a bowl for soaking the used cooking oil, tongs for burning charcoal on the stove, a fine sieve, and a dishcloth to filter out the oil impurities. Here are the steps we'll follow to purify used cooking oil:

				
Stage 1	Stage 2	Stage 3	Stage 4	Stage 5

Make activated charcoal by heating it on the stove.	Adding activated charcoal to used cooking oil.	Soak activated charcoal in used cooking oil for at least 24 hours.	Separating activated charcoal from used cooking oil	Filtering small particles of charcoal and dirt from used cooking oil to produce cleaner and clearer used cooking oil.
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Figure 3. Waste Cooking Oil Refining Process

We also prepared equipment to bring along during school activities, including three portable stoves, three pots, three woks, five stirrers, 35 glass cups, 35 candle wicks, 35 sticks, and 35 pairs of latex gloves. The spacious PM Laboratory and the available equipment, such as stoves and practice tables, facilitated our activities. Furthermore, the students' skills in using cooking utensils further facilitated the process of making aromatherapy candles..



Figure 4. Tools and Materials Used During Activities at Partner Locations

c) Socialization

This outreach activity was conducted using a lecture method combined with a PowerPoint presentation. The material presented included an explanation of the definition of used cooking oil, the sources of used cooking oil, and the potential dangers posed if its use is not properly managed. Furthermore, information was provided on various ways to reuse used cooking oil and the differences in characteristics between used cooking oil and new cooking oil. This method is expected to help participants understand and absorb the information more easily.

The outreach activity plays a crucial role in establishing a foundation for understanding before entering the training phase of making processed used cooking oil products. Participants gained new insights that then served as a foundation for developing creativity and practical skills in subsequent sessions..



Figure 5. Regarding Used Cooking Oil

d) Training in making aromatherapy candles

Following the socialization phase, the activity continued with hands-on training in making aromatherapy candles from used cooking oil. The training

involved hands-on practice in making aromatherapy candles from used cooking oil. Participants were divided into five groups of seven students each. This grouping facilitated supervision, fostered teamwork in project completion, and promoted efficient use of equipment and materials.

The activity took place in the PM Laboratory, which is fully equipped with supporting equipment. Participants wore latex gloves during the candle-making process to prevent direct skin contact with high temperatures that could cause burns. This simple precaution not only ensured safety but also made the activity more comfortable and reduced the risk of injury.



Figure 6. Training in Making Aromatherapy Candles

The stages of activities carried out by participants are as follows:

		
Stage 1 Heat the refined used cooking oil (with palm wax and dye) using a double boiler to create a homogeneous liquid texture. Then, add the fragrance oil.	Stage 2 Print the candle on a glass cup that has a wick installed.	Stage 3 Cool the wax until it hardens into a ready-to-use aromatherapy candle.

Figure 7. Stages of Aromatherapy Candle Making Training

The teacher supervised the practical work, while the students actively participated, gaining hands-on experience in transforming waste into a useful product. Although working in groups, each student created their own scented candle, which they were allowed to take home as a souvenir.



Figure 8. Teacher Involvement in Aromatherapy Candle Making Training Activities

e) Discussion and Q&A

Participants actively participated in the discussion and Q&A session regarding the use of cooking oil processing. They asked critical and relevant questions. Their enthusiasm was evident in their desire to try implementing the recycling process independently at home and in their surrounding environment. This demonstrated a good understanding and motivation to contribute to maintaining environmental cleanliness through the use of cooking oil waste. Teachers were also enthusiastic about discussing with us options for using glass replacements, shops selling the necessary tools and materials (palm wax, dyes, and fragrance oil), candle durability, and more. These aromatherapy candles can be used as souvenirs for guests or stakeholders attending school activities and can be a means of promoting environmentally friendly schools to external parties. The skill of making aromatherapy candles also opens up business opportunities/profit centers for schools.



Figure 9. Discussion and Q&A with Students and Teachers

f) Evaluation

We conducted an evaluation in the form of providing a questionnaire containing questions before the activity started (pre-test) and after the activity was completed (post-test). (Figure 10).



Figure 10. Pre-test and Post-test implementation

Through this evaluation, we wanted to determine the participants' level of understanding of used cooking oil and their skills in making aromatherapy candles from it. The following pre-test questions were given:

- 1) Do you know what used cooking oil is?
- 2) Have you ever made aromatherapy candles from used cooking oil?

3) Have you ever wanted to learn how to make aromatherapy candles from used cooking oil?

The pre-test results (graph 1) show that 88.57% of students were familiar with used cooking oil, 88.57% had never made aromatherapy candles using used cooking oil, and 88.57% were interested in learning how to make them.

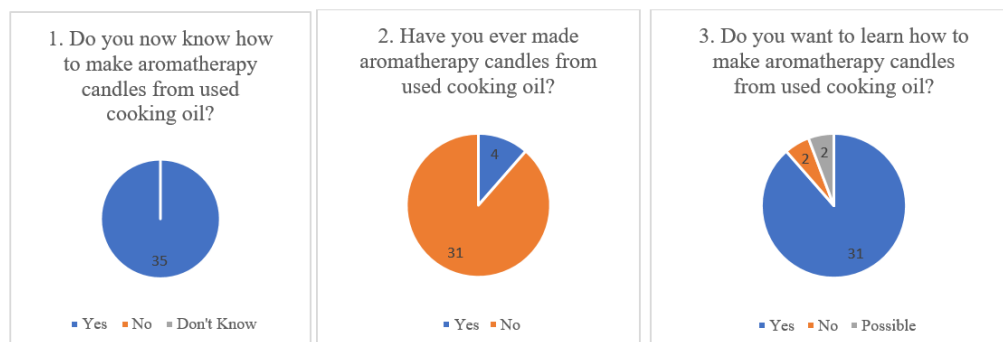


Chart 1. Pre-Test Filling Results

The post-test questions we asked were as follows:

- 1) Do you now know how to make aromatherapy candles from used cooking oil waste?
- 2) Did you enjoy making aromatherapy candles from used cooking oil waste?
- 3) Are you proud of your craft?
- 4) Will you share this knowledge with your friends?

The post-test results (graph 2) showed a significant improvement in skills, with all participants able to make aromatherapy candles from used cooking oil. This indicates that the material delivery was effective. 91.4% of students enjoyed the activity, 88.57% were proud of their work, and 51.4% wanted to share this knowledge with their friends..



Chart 2. Post-Test Filling Results

iv. CONCLUSION

The community service program at SMK Negeri 4 Banjarmasin demonstrated that used cooking oil, often considered hazardous waste, can be processed into useful and economically valuable aromatherapy candles. Participants' skills improved significantly.

Pre-test results showed that 88.57% of participants had never made aromatherapy candles from used cooking oil, while post-test results demonstrated

that all participants successfully produced them independently. This demonstrates the development of new skills related to processing used cooking oil waste into aromatherapy candles.

This activity not only fostered environmental awareness but also instilled an entrepreneurial spirit in students, serving as an effective learning model for other schools integrating waste management, creative education, and environmentally friendly sustainable business innovation.

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