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Chemistry Learning Innovation in Household Level Entrepreneurship Product Training for the Community of Tidung Island

Familia Novita Simanjuntak^{1*}, Nova Irawati Simatupang², St Fatimah Azzahra³, Sumiyati Sumiyati⁴, Nelius Harefa⁵, Elferida Sormin⁶ and Leony Sanga Lamsari Purba⁷

^{1,2,3,4,5,6,7}Chemistry Education, Universitas Kristen Indonesia, Jakarta

*Email: familia.novita@gmail.com

Abstract: *This community service aims to provide support and training to PKK women on Tidung Island. Service implementation is carried out using presentations, interactive discussions, and direct practice to improve the village's capacity and creativity. The objectives to be achieved by this activity are to increase knowledge about the effects of careless disposal of used cooking oil waste and to improve skills in handling used cooking oil so that it is a valuable useful treatment. Used cooking oil is waste cooking oil that has been used many times and contains carcinogenic compounds that are difficult to decompose. Both of these properties are dangerous to health and the environment if used cooking oil is consumed and discharged into the environment without change. To achieve this goal, the method that will be used in this activity is to provide health education on the effects of careless disposal of used cooking oil waste and subsequent processing practices using cooking oil into candles. The outcome of undertaking this activity is an increased understanding of the impact of used cooking oil waste on health and the environment. In addition, you can also take advantage of used cooking oil scraps to make candles.*

Keywords: *Aromatherapy Candles; Oil; Waste Cooking*

INTRODUCTION

Chemistry is a group of science subjects taught specifically to SMA/MA/SMALB students with the following characteristics: (1) abstract, simple, hierarchical, and structured concepts; (2) science of problem-solving and describing facts and events, involving skills and reasoning (Mentari et al., 2017) . Chemistry can be found in everyday life, but quite a few students consider chemistry to be an

uninteresting science (Purba & Fitri, 2021). There are two things related to chemistry that cannot be separated, namely chemistry as a product (chemical knowledge in the form of facts, concepts, principles, laws, and theories) of scientific discovery and chemistry as a process (scientific work).

The biggest challenge of an ideal education process is not only preparing a generation capable of living today but also a generation equipped with the ability to live in the future (Panggabean & Purba, 2021).

Improving the quality of education cannot be separated from various government efforts (Malau & Juniar, 2020). Therefore, chemistry learning and assessment of chemistry learning outcomes need to pay attention to the characteristics of chemistry as a process and product.

More specifically, chemistry subjects are taught to equip students with knowledge and understanding of the daily environment. In education, there are many different learning approaches. Each learning method has advantages and disadvantages. The use of appropriate learning methods and approaches will improve students' abilities and interests in learning chemistry (Ismulyati & Ikhwan, 2019). Students can understand chemical concepts through experience and interaction with the environment. Chemistry can be considered a difficult subject (Zakiyah & Yonata, 2021)

Fun learning by connecting the chemical concepts learned with their application in everyday life, making chemistry learning an interesting subject while encouraging student creativity and innovation and developing knowledge to create useful products (Artani et al., 2021) R&D is a process or steps aimed at developing a new product or improving an existing product, in which all activities can be considered (Donasari & Silaban, 2021).

Aromatherapy candles are one example of a product derived from chemical learning. Aromatherapy candles have the potential to become high-value commercial products and can increase community income. Therefore, it is necessary to empower community groups, especially housewives, so that they can increase their family income and not only depend on the head of the family.

PKK mothers in Tidung Island have a life history as housewives. They spend more time in the kitchen, doing activities such as cooking, washing clothes, and cleaning the house and garden. There is still a lot of free time that can be utilized to do productive work

to meet daily needs and can even be used to develop the family economy. Therefore, they feel they need knowledge and skills in addition to their daily activities.

On that basis, the lecturers and students of the chemistry education program conducted community service in the form of training for PKK women on Tidung Island. It is expected that with the training of making aroma therapy candles, PKK women will be able to understand the importance of additional skills and the importance of utilizing free time to produce.

LITERATURE REVIEW

Aromatherapy candles are an alternative application of aromatherapy by inhalation (inhalation) and will produce aromas that provide therapeutic effects when burned such as insect repellent, alternative medicine, decoration, and air freshener (Melviani et al., 2021). Aromatherapy candles can create calm and help relieve symptoms of stress by lowering the hormone cortisol in the body and overcoming insomnia (Maradona & Hujjatusnaini, 2022).

These aroma therapy candles are made using simple basic ingredients such as wax sticks, lemongrass oil, and yarn. The odor produced by lemongrass oil can repel mosquitoes with its pungent smell (Al-Fatina et al., 2021). Citronella contains essential oils that can repel mosquitoes because it contains linalool, geraniol, and eugenol (Leto et al., 2022). The manufacturing method is quite simple. Characteristics of candles include: a. General characteristics: odorless, tasteless, to the touch feels slippery, burns with a bright flame, if melted produces a non-fluorescent liquid.

The form of using aromatherapy can be in the form of products that provide effects as room fragrances or can also use aromatherapy candles that can be used as a source of lighting (Veranita et al., 2022). Aromatherapy candles are usually used as a tool to improve the aroma and health conditions of the room (Azzahra et al.,

2023). Aromatherapy candles can change air quality to be healthier by causing soothing fragrances (Novitasari et al., 2023). Cooking oil is one of the basic human needs as a food processing tool. Cooking oil as a frying medium is very important and the need is increasing. Cooking oil is oil derived from refined vegetable and animal fats, liquid at room temperature, often used for frying food (Atikah, 2017). Along with the increasing human needs, the use of cooking oil has also increased. As a result, there is often an increase in the production of waste cooking oil, called used cooking oil.

Used cooking oil is oil that is used repeatedly for frying (Wahyuni & Rojudin, 2021). Oil stains are usually brown to black in color. The use of cooking oil can have a negative impact on human health (Ariani et al., 2017). Indiscriminate disposal of used cooking oil waste can cause soil and water pollution. Soil pollution occurs because it causes soil pores to close and harden, thus disrupting the existing ecosystem. Meanwhile, water pollution occurs due to waste entering the water, causing the function of water to decrease, no longer able to support human activities, and making it difficult to provide clean water (Mulyaningsih & Hermawati, 2023).

Used cooking oil is difficult to recycle and cannot be disposed of carelessly without prior processing. To avoid the negative impact of used cooking oil on health and the environment, used cooking oil can be utilized to create a creative economy for the community (Damayanti & Supriyatin, 2021). Therefore, utilizing used cooking oil as a base material for making therapeutic candles is a very simple step (Busalim et al., 2023).

METHODS

The approach used in this research is the descriptive qualitative method. The population includes residents of Tidung Island Village. The research subjects were PKK mothers from Tidung Island. Data collection techniques were carried out using interview

techniques. According to Sugiyono, "Interviews are preliminary research to find problems that need to be researched, as well as when researchers want to know more about a matter from respondents" (Sugiyono, 2015). Researchers conducted interviews with PKK mothers on Tidung Island who were involved in the study.

RESULT AND DISCUSSION

This 120-minute training includes processing used cooking oil into aromatherapy candles. During the training, participants were very enthusiastic about all training materials as seen from the recording of used cooking oil processing stages. The perception of housewives as trainees will be discussed in detail below.

Table 1. Percentage perceptions of aromatherapy candle making training participants for PKK women in Tidung Island

Statement	Score	
	Agree	Hesitate
Training Materials	85%	15%
Aromatherapy candles as additional income	62%	38%
Difficulties in Developing Aromatherapy Candles	77%	23%



Figure 1. PKK mothers shared their knowledge with mam Sumiyati as one of the resource persons

Analysis of Training Materials

Based on the results of interviews regarding training materials on the use of cooking oil as a basic ingredient for making aromatherapy candles, PKK mothers on Tidung Island argued that this training was very useful. From the interviews, it was found that 85% of PKK Tidung Island mothers understood how to make aromatherapy candles, while 15% were hesitant because they were still attending the training for the first time.



Figure 2. PKK Tidung Island women make aromatherapy candle dough

In line with (Mufriantie et al., 2024) research, aromatherapy candle training from used cooking oil is easy to understand and practice. PKK mothers who attended the training increased their knowledge about the use of cooking oil as a basic ingredient for making aromatherapy candles. Through this training, PKK mothers also became aware that they should not carelessly dispose of used cooking oil waste.

Analysis of Aromatherapy Candles as a Side Income

Aromatherapy candles can be a useful item (Wijayanti & Karanganyar, 2023). The profits obtained can not only be

used for mass purposes but can also be resold as souvenir products that can be a source of income. Based on the results of interviews, 62% of PKK mothers on Tidung Island plan to make aromatherapy candles from used cooking oil as additional income. Apart from being an additional income, most PKK mothers also plan to make aromatherapy candles for personal use.

Analysis of Difficulties in Developing Aromatherapy Candles

Based on the results of interviews with PKK mothers about the difficulties of developing aromatherapy candles. Although it is easy to make, the thing that is difficult to obtain is the material used. This is because the location of Tidung Island is far from Jakarta so materials that are easily available in Jakarta are not available on Tidung Island. But this is not an obstacle in making aromatherapy candles, because 77% of PKK mothers think that these ingredients can be purchased online even though it takes a long time.

In making the candles, the team first gave examples to PKK mothers, where participants immediately followed each stage of the training. At the end of the candle training, the team showed samples of preserved or finished candles to the trainees. The participating mothers enthusiastically participated in the experience of making scented candles until the end of the event.

CONCLUSION

Chemistry is a subject that is difficult for students to understand, but if you already understand the concept, it will feel easy to do. In this research, chemistry learning innovations were applied through training on recycling used cooking oil into aromatherapy candles. This training was conducted by lecturers and students of the Chemistry Education Study Program to the mothers of the Tidung Island PKK. This training received a positive response from the trainees. The training process went

smoothly and the experiment of turning used cooking oil into wax was easy to do according to PKK mothers this training was 85% easy to understand and do. As many as 62% of PKK mothers who participated in this training understood that using cooking oil will have a negative impact that is not good if used repeatedly and will use used cooking oil in aromatherapy candles. PKK mothers know that used cooking oil is also difficult to decompose, so this is the reason that 77% of PKK Tidung Island mothers will make aromatherapy candles again, both for their use and to be used as additional income.

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