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Chemistry Study and Entrepreneurship Program for the Younger Generation at Sanggar Bimbingan Sentul, Kuala Lumpur Malaysia

Anugrah Ricky Wijaya[1*] , Alif Alfarisyi Syah[1], Helwani Fuadi[1], Irma Kartika Kusumaningrum[1], Indah Nur Pramesti[1]

Chemistry Department, Faculty of Mathematics and Natural Sciences, Universitas Negeri Malang, Indonesia.
Corresponding author: anugrah.ricky.fmipa@um.ac.id

Abstract: The issues faced by the sons and daughters of Indonesian citizens (WNI) in Malaysia are social inequality, access to education, and a sense of community involvement. Sanggar Bimbingan Sentul, as a partner, provides learning facilities for WNI's children to solve these three main problems. We initiated to apply the program of MAWIRAKI (Matahari Kewirausahan Kimia) with chemistry study and entrepreneurship program through the Pengabdian Kemitraan Luar Negeri (PKLN) grant by Universitas Negeri Malang (UM). This program integrated by computer training with MS-Word and Paint programs, chemistry daily-life experiments, and the art of batik craft. The results of learning process WNI's children shows that 18 favored students in the Paint program and 10 in the MS Word program during computer training. The "Where's Vitamin C" experiment garnered support from 17 students, highlighting an interest in chemistry study. These activities involved the batik ecoprint and jumput, which received a positive response, with 15 students favoring batik jumputan and 11 choosing batik ecoprint. The WNI's children interest data during the learning process as the foundation and our spirit for developing programs to unearth the entrepreneurial potential and creativity of the younger generation.

Keywords: Chemistry education, Entrepreneurship, WNI's children

INTRODUCTION

Sanggar Bimbingan Sentul is one of the educational and counseling centers, embodying the full commitment of the Embassy of the Republic of Indonesia (KBRI) to expand access to non-formal education for the children of Indonesian migrant workers residing in the Peninsula of Malaysia(Sudarmanto, 2022). This establishment serves as a response to the limitations of formal educational institutions in Malaysia, such as the Indonesian School of Kuala Lumpur (SIKL) and the Indonesian School of Johor Bahru (SIJB), which cannot accommodate all Indonesian children in the peninsula. As a result, Indonesian parents and legal or undocumented residents in Malaysia do not have equal access to education for their children(Jatmika, 2023).

The primary objective of Sanggar Bimbingan Sentul is to provide educational access for (1) school-age children who are not enrolled, (2) children without access to formal education, (3) illiterate children, and (4) children whose educational needs are not met by formal institutions. As of 2023, there are approximately 33 students at Sanggar Bimbingan Sentul, ranging from grades 1 to 6. The establishment of this center is a community-driven initiative aimed at enhancing the quality of education, with governmental support in terms of guidance, development, and facilitation through resources, instructors, and facilities.

Regrettably, there is a scarcity of comprehensive programs for Indonesian migrant children in terms of entrepreneurship-based education, vocational training, and soft skills development (Mosbah et al., 2018; Yuniarto, 2019). Through entrepreneurial activities, the younger generation is expected to create or expand businesses that meet market demands. In the current context, the 2023 Chairman of Sanggar Bimbingan Sentul has become a partner, agreeing to collaborate further in ensuring that Indonesian children in Malaysia, particularly the children of migrant workers, receive their fundamental rights to education without discrimination(Murni Saptasari, 2019).

METHOD

Introducing of chemistry daily-life knowledge through an interactive approach to children was the primary goal. Introduction to Microsoft Word, Paint, engaging experiments with the title "where is the vitamin C," and simple separation process experiments were chosen to foster learning. The core activity revolved around entrepreneurial training in crafting tie-dye and eco print fabric, spanning four days. Day one we focused on learning and experimentation, followed by an introduction to the tie-dye and eco print fabric-making techniques on day two. Day three we featured the practical creation of fabric using various materials and instant dye powder coloring techniques. The fourth day we centered around product and activity evaluation.

Experiment procedures:

Where is the vitamin C

Tools and materials: Two glasses with 25 ml of water, betadine, lemon juice, packaged orange juice.

Experiment: Lemon was added to the first glass until the solution turned colored. A few drops of betadine was added to each glass of water and stirred evenly. Finally it was observed until the disappearance of color in the solution (Tembusai et al., 2021).

Simple Separation

Tools and materials: Perforated filter paper, intact filter paper, colorful markers, a glass of water.

Experiment: The colorful markers were made to encircle holes on the filter paper. The other rolling piece of filter paper was placed into the holes of the first filter paper. The glass was covered with the filter paper and ensured the end rolled paper submerged in water. The process was conducted to witness the color change in the marker ink due to water absorption.

Ecoprint Fabric Production (Batik Ecoprint)

Tools and materials: Natural fiber fabrics like cotton, silk, or canvas, leaves/flowers, vinegar, alum-water mixture, plastic pipe, string, pot.

Experiment: Preparing the fabric by soaking it in alum-water for an hour, printing the fabric with leaves or flowers arranged systematically and pounded to create patterns, steaming the fabric for one and a half hours, untying the fabric, fixing it, and washing it (Natadjaja et al., 2012).

Tie-Dye Fabric Production (Batik Jumputan)

Tools and materials: Cotton/moria fabric, rubber bands or raffia strings, marbles, stones, or coins, salt or vinegar, fabric dye, pot, spatula.

Experiment: The plain fabrics were designed with a certain pattern, wrapped in marbles, and tied them by rubber bands or raffia strings. They were dipped into a dye solution, submerged to plain fabric, allowed to soak for 2 minutes until the dye was absorbed, drained the fabric on a flat surface, and untied it to observe the resulting colors.

RESULTS AND DISCUSSION

Implementation of the education and entrepreneurship

In 2023, there were approximately 33 students at Sanggar Bimbingan Sentul, ranging from grades 1 to 6 of elementary school. However, their attendance is not consistent every day, and sometimes classes are mixed due to limited space. The establishment of the Sanggar Bimbingan Sentul serves as a community-based institution to provide a learning environment for the children of migrant workers. Unfortunately, there is a lack of concepts and formulated programs for these Indonesian migrant children, especially in terms of entrepreneurship education, vocational training, and soft skills development. Therefore, our team provided the teaching and materials to the

children, keeping up with the advancements of the digital era. This included the development of everyday chemistry knowledge and the potential for entrepreneurial training, covering the introduction and training in Microsoft Word and Paint, conducting everyday chemistry experiments/practicals, and creating ecoprint and jumputan batik.

Figure 1. Welcoming and introduction from the team leader

First days of implementation

On the first day of our program, we started with an introduction to computers and software, particularly Microsoft Word and Paint. This is important because in the digital age, a basic understanding of computers and fundamental skills like using word processing programs is a crucial foundation. Participant responses varied; some children showed great enthusiasm and quickly grasped the basics of using a computer, while others may have needed more time to adapt. Here are some key points: The use of Microsoft Word is a fundamental skill that is highly essential in various job sectors and education. It equips children with a tool for written communication and expressing their ideas. It is important to understand that not all participants have the same level of computer experience. They gave us varied responses due to some of them using the computer for the first time.

Figure 2. Introduction of the MS.Word and Paint software

Second and third days of implementation

On the second and third days, we focused the program on a chemistry practical, including the "Where's Vitamin C" experiment and the separation of marker pen color components. Participant responses varied again; some participants showed great enthusiasm and a willingness to learn more about chemistry, while others needed time to grasp the concepts and laboratory equipment. The key points here are: Exploring the science of chemistry: The chemistry practical provides children with a basic understanding of chemistry and how this science can be applied in daily life, such as in determining the vitamin C content in sachet products. It's important to emphasize that chemistry activities must be conducted under careful supervision and guidance. Participant safety is paramount.

Figure 2. Documentation of chemical experiment processes

Implementation of the fourth and fifth days

On the fourth and fifth days, children learned to create ecoprint batik. Participant responses reflected their interests, art skills, and exploration in the world of batik. The key points here are: Development of art skills: Some children displayed outstanding artistic talent, while others required additional guidance. This highlights the uniqueness of each participant. Although safe synthetic chemicals were used, it's important to ensure that participants understand how to use and handle chemicals safely. Diverse participant responses are a natural part of the learning process, and the goal of this program is to provide opportunities for children to develop skills, interests, and understanding in various fields.

Figure 3. Documentation of the jumput batik training process

Evaluation of activities

Overall, this program provided participants with an opportunity to explore the world of art and develop their creative skills while introducing them to the use of chemicals in art. Safety and understanding of chemical materials were always a priority during these activities. Diverse responses reflected varying levels of experience and interests among the participants, all of which are integral to the learning experience. The survey results are shown in the Figure 4, as follows:

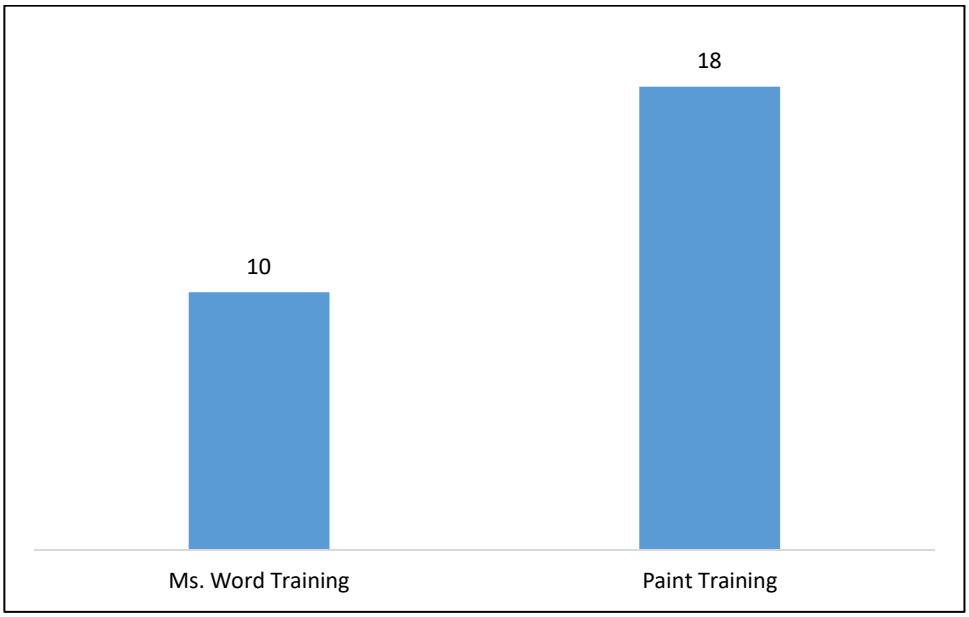

Figure 4. Student interest survey on the first day of training

Figure 4 shows that 18 children showed a greater interest in the Paint training compared to MS Word. This suggests that these children may have a specific interest in digital art or computer-based art. Their strong interest in Paint could be influenced by the creative elements involved in using drawing tools and colors in the program. Conversely, 10 children showed an interest in the MS Word training, indicating that some participants are more drawn to the typing and word processing aspects taught in MS Word. This interest may stem from a desire to learn more about using word processing software commonly used in various contexts.

The survey results highlight the importance of understanding individual interests and preferences during the learning process. As instructors or educators, these results can serve as a guide for designing a more tailored learning experience for participants. For example, children who prefer Paint can be given more digital art projects, while those interested in MS Word can receive more challenging writing tasks.

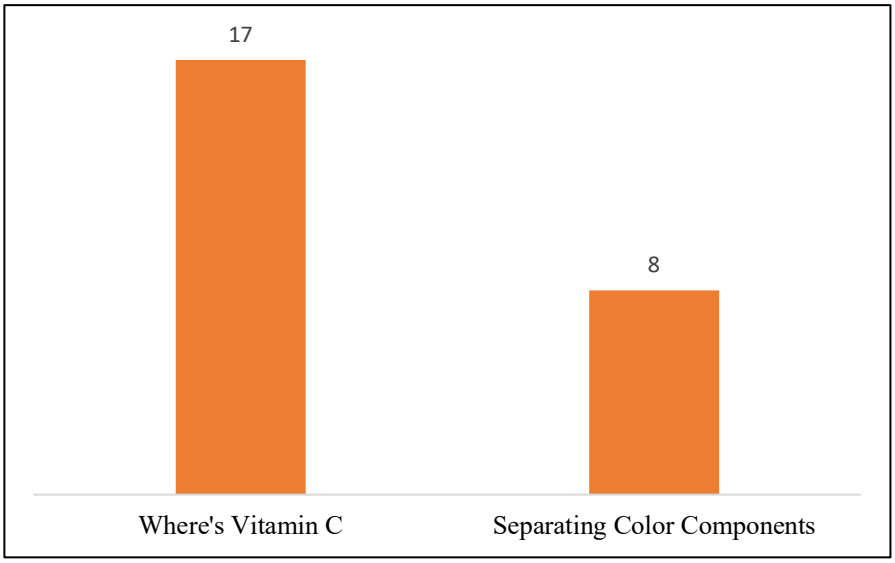

Figure 5. Student interest survey on everyday chemistry experiments

As shown in Figure 5, it indicates that 17 children displayed a greater interest in the "Where's Vitamin C" experiment than in the separation of marker pen color components. This suggests that these children might be more inclined towards the field of chemistry and laboratory experiments. Their strong interest in the "Where's Vitamin C" experiment may stem from their fascination with the scientific aspects involved in determining the vitamin C content in sachet products. On the other hand, 8 children showed an interest in the activity of separating color components. This may indicate that some participants have an interest in understanding the concept of chemical separation and related experiments. Their interest could derive from a desire to gain a deeper understanding of how color components are separated in laboratory experiments. The impact is that even with differing interests, teaching methods that integrate chemistry with color separation can provide a more comprehensive and multidisciplinary learning experience. This allows children to develop a deeper understanding of chemistry in a broader context.

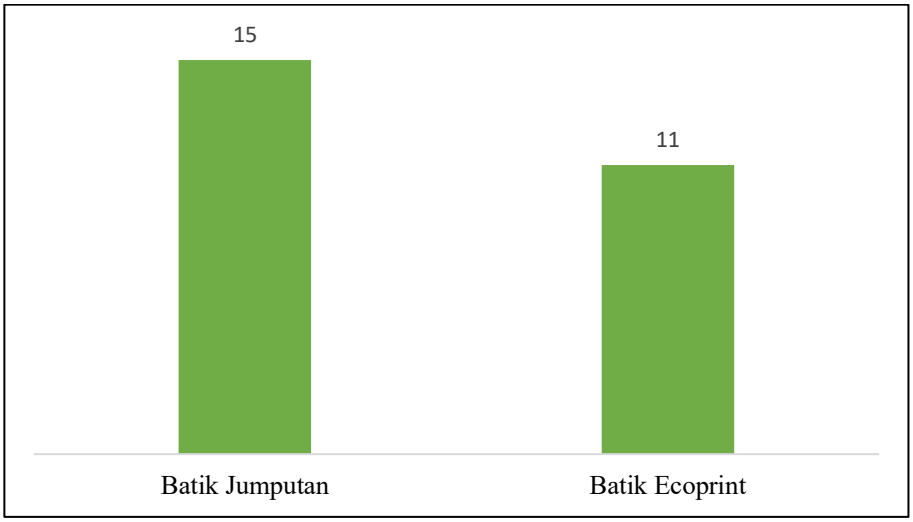

Figure 6. Student interest survey on batik training

From the survey results, it is observed that 15 children exhibited a greater interest in the batik jumputan activity compared to batik ecoprint. This indicates that these children may be more inclined towards the traditional technique of tie-dye batik. Their strong interest in batik jumputan could be influenced by the artistic and craft aspects associated with this technique. In contrast, 11 children showed an interest in ecoprint batik. This may indicate that some participants have a specific interest in experimenting with natural leaves and ecoprint techniques in batik production.

Children interested in art and crafts through batik jumputan and batik ecoprint activities have the potential to start businesses in the creative and art industries. They can become successful and creative young entrepreneurs.

Understanding children's interests and developing their skills in various fields, training programs can stimulate entrepreneurial potential among them. Educators can support the development of these skills and interests by providing opportunities for exploration and practical experience. Through an integrated approach, children can leverage their interests to start businesses that align with their talents and passions in the future. With the right support and guidance, they can become successful and creative young entrepreneurs.

CONCLUSIONS

The implementation of community service was successfully carried out for 5 days at the Sanggar Bimbingan Sentul. This program shows a variety of interests, skills and enthusiasm in participating in various training activities. The results of the interest survey also indicate that entrepreneurial potential can be developed by understanding children's individual interests and supporting the development of skills that match these interests. With the right guidance and guidance, they have the potential to become successful young entrepreneurs in various fields.

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