

Training in electrical *canting* for children with special needs to improve batik quality

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ABSTRACT

"Asal Batik" SMEs helps children with special needs by teaching them how to make batik, a traditional cloth. These children often face challenges in society, so this community service program aims to equip them with important batik skills, encouraging independence and inclusiveness. The process of making batik is made simple so that it is easy for children with special needs to follow. However, SMEs involved in batik production face challenges such as limited production scale and insufficient infrastructure. To overcome this problem, this community service introduced electric *canting* to increase production and facilitate marketing on a larger scale. In addition, support is provided in the form of funds, equipment, and materials to increase overall production capacity. The efforts made by "Asal Batik" SMEs have resulted in positive changes. There has been a marked increase in both production levels and the variety of batik products, thanks to advances in electronic batik equipment which makes it easier for children with special needs to participate. This shows the positive impact of the community service in helping children become economically empowered and socially involved.

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1. INTRODUCTION

Batik is a cultural and legendary phenomenon in the field of fabric culture creation. A collection of decorations with various meanings and symbols can be found on a piece of cloth in several regions in Indonesia. One of them is on the island of Java. The variety of batik decorations comes in very diverse artistic expressions, both in variations of shape and color, in addition to being very numerous. Since its release, batik is one of Indonesia's world cultures, UNESCO has provided awareness to all Indonesian people to maintain and develop batik. Batik is currently experiencing very rapid development following technological developments, not only hand-written batik, but the phenomenon of large numbers of machine-printed batik being produced by textile factories, this will threaten the continued preservation of hand-written batik in society. Printed batik produced by textile factories is much cheaper than written batik produced by batik craftsmen. The development of batik art from time to time continues to experience changes that reflect changes in the social, cultural, political and economic life of society at that time (Soeparman, 2013).

The origin of batik comes from the word "asal" which means like, and batik which means batik cloth which is the cultural heritage of the nation. "Asal Batik" means an entrepreneur who makes batik with original/liked motifs, which is important to be interesting. It is called *Asal*, because the method of making it is quite unique and easy, because batik is produced by Children with Special Needs (ABK) with the age range from 13 until 17 years old. Groups of people with disabilities in society usually tend to experience discrimination in their daily lives because the physical and social environment is not inclusive. This means that the environment in which people with disabilities find themselves tends not to support the actualization of their potential. The owner of "Asal Batik" SMEs is Mrs. Choirun Nisa, an entrepreneur who had the idea to empower crew members to be able to be independent despite their limitations. Mrs. Choirun Nisa discovered a batik technique that can be done by crew members. "Asal Batik" SMEs is located at Graha Mulia Asri, Meteseh, Tembalang, Semarang City. The initial motivation for this batik production was to be able to develop batik work and to encourage crew members to be able to work and have their own income. "Asal Batik" SMEs has 20 workers, of which 15 are crew members. Even though the SMEs Asal Batik are able to run, the business is experiencing several obstacles through up and down.

Batik production is carried out by Mrs. Choirun Nisa with the help of 15 crew members using a by order system, that is, batik is produced only when orders are received. This is because Mrs. Choirun Nisa does not have adequate facilities and infrastructure so that the batik making process is also carried out using simple methods and tools. Limited infrastructure means limited production quantities. According to Figure 1, it shows production process that used a simple tools and process.



Figure 1. Batik production process used a simple tool

The main problem in "Asal Batik" SMEs is the production process. The batik cloth production process requires adequate facilities and infrastructure, moreover, this SMEs only uses children with special needs as craftsmen or batik makers. However, sufficient raw materials are only available if the order has been received, and the tools used are also very simple and limited in quantity. Therefore, the aim of empowering this community is to use and utilize new equipment that helps make the batik production process faster, easier, and more efficient. Implementation of the use of new equipment will be guided by the service team. To foster creativity and inclusivity, the use of electric *canting* has emerged as a new breakthrough for children with special needs.

A *canting* for making batik is a small tool consisting of a handle/stem made of bamboo, a *nyamplungan*/body of the *canting* (where the liquid wax is placed) and a carat/cucuk (where the wax comes out when making batik) made of copper. This *canting* is used to write batik patterns with wax. According to their function, there are *canting reng-rengan* (for making batik batik first according to a

pattern or without a pattern) and *canting isen* (for making batik filled fields). According to the size of the bowknot, there are small, medium, and large bowknots. According to the number of *cucuk* there are *canting cecekan/cucuk one*, *canting loron/cucuk two*, *canting telon/cucuk three*, *canting prapatan/cucuk four*, *canting Liman/cucuk five*, *canting byok/cucuk seven or more* and *canting jointly/galaran* (even *bercucuk* arranged from top to lower) (Hermawati et al., 2022).

As time goes by, new innovations are being developed in the form of electronic *canting*. This electronic *canting* consists of three main parts, namely a container for batik wax or wax, a holder, and a temperature control device which functions to control the temperature of the *canting*. One other advantage, the *canting* beak can be removed and replaced according to the desired size. All types of *canting* beaks, namely *ceceg*, *klowong*, *tembogan*, double *ceceg*, and double *klowong* can be installed on the body of the *canting*. In fact, in traditional *canting*, these five types are separate (Sayekti, 2020).

The *canting* tool, which is used to apply wax to the fabric, is connected to an electric current. This allows the wax to be applied with greater precision and control, resulting in more intricate and detailed designs. The electric current also helps to melt the wax more quickly, making the process faster and more efficient. Additionally, electric *canting* can help to reduce the amount of waste generated during the batik making process. By allowing for more precise application of wax, there is less excess wax left over, which can be a significant issue in traditional batik making methods (Nugroho & Anis, 2019).

Overall, the use of electric *canting* in batik making offers several benefits, including increased efficiency, greater precision, and reduced waste, making it a valuable tool for batik makers around the world. With this electric *canting*, it is very easy to write batik, without having to be painstaking, without having to be careful, it is very easy to use, just like writing using a marker or pen. This *canting* is equipped with a lever that controls the release of wax/paint and the *canting* eye can be replaced as needed while working (this can be done while it is being used, the wax/paint will not spill because there is a valve/valve that holds the wax/paint) (Antana, 2016).

2. METHODS

The method used in this Community Service Program is the mentoring method. The mentoring method is carried out by starting with a survey of partner locations (Irby et al., 2017). From the location survey and communication with partners, various problems faced by "Asal Batik" SMEs partners can be formulated. As a result of mapping the problems faced by partners, solutions are offered to overcome the problems faced by SME partners. As for problems in the pen, after partners agree to the solutions offered, implementation steps are then determined that will be taken to realize the solutions that have been offered.

Socialization Stages

This activity includes descriptions, identification of the needs of "Asal Batik" SMEs through discussions and meetings, planning to overcome existing problems, indicators of success and pioneering partnerships between the service team, students involved and "Asal Batik" SMEs. The socialization of this empowerment program focuses more on batik production using technology in the form of electric *canting*. Socialization activities are carried out by conveying the aims and objectives of the program so that the program can run smoothly. A brief demonstration of the empowerment process that will be carried out to achieve an understanding between the service team and batik producer workers. Ensure that all information related to the program has been conveyed properly by asking for feedback or

responses to matters related to the batik business empowerment program. Make a clear partnership agreement with batik-based SMEs so that the rights and obligations of each party are clear during the service process.

Training Stages

This activity was carried out to overcome one main problem, namely problems in the batik production aspect. Problems in the production aspect were overcome by holding training on several things, including introduction to types of fabric, motif making techniques, coloring techniques, batik techniques and finishing processes and most importantly, the batik process was carried out using an electric *canting* (Martino et al., 2021).

An introduction to types of fabric includes an explanation of what types of fabric are suitable for giving batik motifs, because each fabric has its own characteristics so that each type of fabric has different methods or techniques used in the batik making process. Some of the activities in this training include participants being able to learn about choosing the right fabric, tightening fabric, cleaning fabric, and basic techniques for waxing fabric.

Motif making techniques include training in various techniques for making various batik motifs. This includes manual techniques such as using *canting*, stamping techniques, free writing techniques, or a combination of these techniques. As well as an explanation of today's modern batik motifs so that the training participants' insight can develop following the times and fashion. Some of the activities carried out included explanations regarding the use of electric *canting*, selecting motifs, and techniques for controlling the flow of wax on fabric.

Coloring techniques are training in techniques for applying color to batik, including dye preparation, color mixing, and the coloring process itself. Participants can learn techniques for dyeing fabric in dye solutions, controlling dyeing time, and techniques for creating gradations or special effects in dyeing.

In batik technique training, trainees can learn the correct batik technique, the use of batik materials, as well as the process of drying and removing wax from the cloth after completing batik. Moreover, there is a special technique for the batik process for ship crews with their respective limitations.

The finishing process includes finishing stages such as boiling, shrinking the fabric, and drying to get good batik results. Training participants can also learn other finishing techniques such as batik coating or lamination, as well as techniques for sewing or assembling batik cloth into finished products such as clothing or accessories (Setiawan et al., 2023).

Application of Technology

Problems in the production aspect will be overcome by providing additional tools and materials to increase batik production and the quality of batik products. Additional tools and assistance provided include electrical *canting*, night pan, dye container, brush, dyeing tub, batik ruler, and cloth binder. The addition of tools and materials aims to increase production quantities and improve quality, so that they can become basic capital to increase product selling value (Astuti et al., 2021). At this stage partners are assisted in using new equipment to increase the efficiency of the production process.

Electrical *canting* likely refers to an electrically heated tool called a *canting* that is used in the process of making batik, a traditional Indonesian method of fabric dyeing and decoration. In batik, hot wax is applied to specific areas of the fabric to resist the dye, creating intricate patterns and designs (Lestariningsih, 2017)

Traditional *canting* tools are usually heated over an open flame, but in modern applications, electrically heated *canting* tools are used for safety and convenience. These electrical *canting* tools have a built-in electric heating element that keeps the wax at a consistent temperature, making it easier to control the wax flow and apply precise patterns onto the fabric (Helmy et al., 2019).

The process typically involves filling the *canting* tool with hot wax and then using it to draw the desired design onto the fabric. Wherever the wax is applied, it acts as a resist, preventing the dye from penetrating the fabric. Once the wax has dried and set, the fabric is immersed in a dye bath. After dyeing, the wax is removed by heating the fabric to melt and remove the wax, revealing the dyed pattern.

Using electrical *canting* tools simplifies and enhances the batik-making process, allowing for greater precision and control in creating intricate and beautiful designs on fabric.

Evaluation

Evaluating the process of making batik using electrical *canting* involves assessing various aspects to ensure the quality and effectiveness of the final product. Here are some key factors to consider: (1) Design Precision. Evaluate how well the electrical *canting* tool allows for detailed and precise designs. Check if it enables smooth and controlled wax application; (2) Temperature Control. Assess the effectiveness of the electrical *canting* tool in maintaining a consistent temperature. Temperature control is crucial for achieving even wax application and preventing wax from becoming too hot or too cool; (3) Ease of Use. Consider the user-friendliness of the electrical *canting* tool. Evaluate factors such as weight, grip, and maneuverability. An ergonomic design can contribute to a more comfortable and efficient batik-making process; (4) Safety Features. Ensure that the electrical *canting* tool has appropriate safety features, such as temperature controls and insulation to prevent burns or accidents during use; (5) Durability. Evaluate the build quality and durability of the electrical *canting* tool. A durable tool will have a longer lifespan and contribute to consistent results over time; (6) Wax Flow Control. Check the ability of the tool to control the flow of wax. A well-designed electrical *canting* tool should allow the artist to easily control the amount of wax released, contributing to intricate and well-defined patterns; (7) Compatibility with Materials. Ensure that the electrical *canting* tool is suitable for use with the specific materials and types of fabric commonly used in batik making; (8) Cleaning and Maintenance. Assess how easy it is to clean and maintain the electrical *canting* tool. A tool that is easy to clean will contribute to a more efficient and enjoyable batik-making process; (9) Energy Efficiency. Consider the energy efficiency of the electrical *canting* tool. An energy-efficient tool may have a lower environmental impact and contribute to cost savings over time.

By carefully evaluating these factors, the team can determine the effectiveness and suitability of the electrical *canting* tool for the batik-making process and make any necessary adjustments to improve the overall quality of the finished batik products.

Sustainability

After evaluating the process, the team needs to ensure that the sustainability of the service program aims to evaluate the effectiveness and long-term impact of the program. At the sustainability test stage, evaluation will be carried out through program achievement indicators. Apart from that, there also needs to be a good communication pattern between partners and helpers so that what is given can provide benefits (Kartikasari, 2019; Hermawati et al., 2020).

In the service process, there needs to be a division of tasks so that the service can run well: (1) The empowerment team (Lecturers) will act as directors of the training program to increase awareness

and direct procedures for using electric *canting*. The lecturer will act as director of the training program to increase awareness and direct the use of electric *canting* which is more practical and efficient than manual *canting* for children with special needs and evaluate the progress of the process that has been implemented; (2) The empowerment process requires collaboration between the service team and partners. Therefore, partners must also have a contributing role to increase the success of the program. Partners contribute in preparing training locations along with facilities and infrastructure to support the smooth running of the training program.

3. RESULTS AND DISCUSSION

"Asal Batik" SMEs is a start-up business that started from someone's concern for the fate of children with special needs (ABK). Based on the condition of children with special needs who have limitations and often have obstacles in getting work, "Asal Batik" SMEs strives to foster children with special needs to have financial independence. The dedication process is carried out in several stages. The process stages are as follows:

Coordination Process

In the initial stage, the service team coordinates the service process with partners as shown in Figure 2. This process is carried out to ensure the program runs according to plan. Therefore, in the initial process we coordinate the timeline of activities with partners along with the division of tasks and responsibilities. Creating a clear schedule of activities and division of tasks will facilitate the success of the activity process. Apart from that, at this stage the team carries out an inventory of needs and plans the activity process. The empowerment team (lecturers) will act as directors of the training program for the use of electric *canting* in making batik. The lecturer will act as director of the training program to increase awareness and direct procedures for using electric *canting* and evaluate the progress of the process that has been implemented. The empowerment process requires collaboration between the service team and partners. Therefore, partners must also have a contributing role to increase the success of the program. Partners contribute in preparing training locations along with facilities and infrastructure to support the smooth running of the training program.



Figure 2. The service team coordinates with partners

Training Batik Production Use Electrical *Canting*

Training is used to solve batik production problems carried out by children with special needs. The Covid-19 pandemic condition caused the number of requests to decrease drastically so that capital

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Noni Setyorini, Ika Menarianti, Prianka Ratri Nastiti, Inayaturo Rosidah, Daffa Arya Dinata

turnover was very minimal, so that in the end partners experienced capital constraints to carry out production. Based on these conditions, the service team intends to aid with production tools and materials according to partners' needs so that the amount of production produced can increase. The following is the production process carried out by partners in making batik using electric *canting* which has more advantages than manual *canting*. The batik was made by a child with special needs who was deaf. The process begins with drawing batik, followed by electric *canting*, coloring, and washing the batik that has been made. Figure 3 shows that batik is processed by children with special needs.



Figure 3. Batik production process by children with special needs

Discussion

For "Asal Batik" SMEs partners, the application of electric *canting* technology is very helpful in the production process carried out by children with special needs, so that partners save more time in producing batik and can fulfill orders from customers quickly. Apart from that, the quality of batik made using electric *canting* is better and neater than with manual *canting*. By increasing the quality of batik production, the number of orders from customers can also be increased (Syamsuri & Abidin, 2016; Imamilkhor et al., 2023).

Training on using electric *canting* to make batik for children with special needs is a program that uses electric tools to help children with special needs in the batik making process. Electric *canting* is a tool used to form batik by attaching color directly to the cloth (Hermawati et al., 2022). This training aims to help children with special needs in the batik making process, such as children who have ideas or physical disabilities that make it difficult to use traditional tools such as wooden *canting*. Electric *canting* has several advantages for children with special needs, First, Electric *canting* has higher speed and is easier to control, so children with special needs can place colors more easily and accurately. Second, more comfortable to use: Electric *canting* has a softer wire and does not require tension like wooden *canting*, so children with special needs can place colors more comfortably and without causing pain. Third, More flexible in use: Electric *canting* has a more flexible speed and can be used to place colors in a wider area, so that children with special needs can place colors more widely and cover more fabric (Wardhani et al., 2023).

Training to use electric *canting* to make batik for children with special needs also has several other benefits, such as helps children in motor development: Electric *canting* is lighter in weight and can be used to place colors in higher areas, so children with special needs can help in motor development. Helps children in cognitive development because electric *canting* has a higher speed and can be used to place colors more accurately, so children with special needs can help in cognitive development. Helps children in social development because electric *canting* has a more flexible speed and can be used to place colors in a wider area, so that children with special needs can work together and help each other.

Training to use electric *canting* to make batik for children with special needs is a very interesting program and has many advantages for children with special needs. This training can help children with motor, cognitive and social development, as well as speed up the batik making process for children with special needs.

Table 1. Comparison when using electronic *canting* and conventional *canting*

Items	Electronic <i>canting</i>	Conventional <i>canting</i>
Precision Temperature Control	Allows for more precise temperature control so resulting in better and more consistent outcomes.	The tool can not control the temperature
Heating	Most electronic <i>canting</i> does not require continuous reheating	Need continuous reheating
Ergonomic Design	User comfort	User inconvenience
For user (child with special needs)	Easy to control	Difficult to control

4. CONCLUSION DAN RECOMMENDATIONS

This service aims to overcome production problem in "Asal Batik" SMEs in Tembalang, Semarang. The target to be achieved in this program is that partners are able to produce batik in better quantity and quality. The implementation of this program is divided into 2 stages, namely the implementation stage and the evaluation stage. Equipment and supporting facilities, availability of space, partner involvement, and support from the community are the main factors in successfully achieving the goals of this program. The results achieved are in the form of increasing production numbers. Based on this, it can be concluded that children with special needs have good knowledge regarding the application of batik technology using electric *canting*. A new paradigm for children with special needs is the use of electric *canting* as a medium for making batik, even though manual *canting* is not abandoned. This is very important as a learning medium and increasing batik production capacity. If you use an electric *canting* to make batik, the wax that is etched into the batik design will turn out neater because the hearth in the electric *canting* is more stable. So that the resulting color avoids the impression of being uneven. The way it works is also easy, just put the hard wax into the tube and wait a moment for the wax to melt, so the resulting color is very bright.

This service has limitations, namely the production process is carried out by children with special needs so that the process required takes longer. The suggestions for service are: Firstly, it is necessary to provide ongoing assistance and monitoring to partners so that this program can be continued periodically. Second, production management SOPs are needed so that products have good quality. Third, it is necessary to improve business management to increase business. It is best if the program can be followed up through collaboration with other partners or other parties outside the institution, so that we can find out a wider response to the implementation of the community service program that has been carried out. Partners can provide useful information regarding needs that align with the skills and knowledge that will be used to implement similar community service programs.

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