Development of bamboo handicraft product from Brajan Sendanggung Minggrir Sleman

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Abstract. The targets of this activity are small and medium enterprises (SME) Prinx Mas and Pring Gedhe. This activity’s main objectives are to improve the quality and quantity of products, increase the comfort level of owned facilities/facilities, and increase the product marketing network. The method used is by implementing technology assistance activities as well as training and mentoring. Technology assistance in the form of production equipment, arrangement of the showroom, updating the website and enhancing partners’ capabilities by providing various training and mentoring. The technology equipment provided to partners is a multi-functional grinding machine and drying oven. Meanwhile, the training held was training on the fabrication process and training in drafting contract drafting. The results that have been achieved are (1) Prinx Mas SME experienced an increase in productivity by 11%, an increase in assets by 4.5%, and an increase in turnover by 8.75%; (2) Pring Gedhe SME experienced an increase in productivity by 8.8%, an increase in assets by 4.8%, and an increase in turnover by 7.3%.

1. Introduction

Bamboo handicrafts can be found in all districts in Special Province of Yogyakarta, especially in Sleman Regency [1]. One of the famous bamboo handicraft centers is located in Brajan village, Sendanggung, Minggrir, Sleman. There are two partners involved in this study, which are Prinx Mas small and medium enterprises, called as partner I, and Pring Gedhe small and medium enterprises (SME), called as partner II. Both partners are well known among tourists (local and foreign tourists) for their high quality products. They also always make innovations in their products and follows market trends [2].

Apus bamboo, wulung bamboo, cendani bamboo, petung bamboo and ampel bamboo were the raw material used in bamboo handicraft products. These raw materials could be obtained easily in Sleman Regency. Production equipment owned by partners is still straightforward, consisting of manual equipment. The equipment includes manual saws, manual slitting knives, drilling machines, and sanding machines. When there is a large order, both partners are very overwhelmed in fulfilling it not to order fulfilled. Partners are in dire need of production equipment assistance and fabrication capabilities to modify their equipment.

The partners’ production process, namely starting from making product design drawings, cutting bamboo according to product size, splitting/cutting bamboo, bending bamboo, weaving processes, drying processes, checking/quality control, and finally, finishing processes. The drying process is carried out directly by utilizing heat from the sun. If the weather is not hot enough like in the rainy season, the...
drying process becomes obstructed. This will cause a delay in producing the handicrafts and the products become moldy due to water contained in bamboo. Various kinds of newspaper holders, fruit basket, tissue holders, lamp shades, slippers, bags and souvenirs are products made by our SME partners (figure 1). They also accepted products requested by customers.

![Newspaper holder](image1)
![Fruit basket](image2)

![Various Place Tissue](image3)
![Various Lamp Shades](image4)

![Various Slippers](image5)
![Various Bags](image6)

**Figure 1.** Some of the partner products

Partner production capacity is between 500-800 units/month, with a turnover of Rp. 15,000,000-18,000,000/year. Local marketing reaches Yogyakarta, Magelang, Semarang, Solo, Purwokerto, Bandung, Jakarta, Bali, Sumatera, and Kalimantan. Meanwhile, overseas marketing reaches Australia, Singapore, America, and Dubai. In the buying and selling process, especially in serving large orders, the two SMEs have not used a sale and purchase agreement/contract, so it is perilous to have an achievement that can harm the SME.
Based on the situation analysis described above, several problems still experienced by partners can identify:

a. Additional requires production equipment.

b. The drying process depends on the heat from the sun and if the weather is not hot enough like in the rainy season, the drying process becomes obstructed.

c. Fabrication requires engineering capabilities for the modification of some production equipment.

d. It needs an administration room and showroom arrangement.

e. Not yet have the ability to draft a drafting contract.

For these problems, a solution must found immediately. Lecturers have to carry out the Tri Darma of Higher Education, namely, in addition to implementing education and teaching, it is also obligatory to carry out research and community service [3]. We, the service team, feel called to try to find a solution to these problems. Small and medium enterprises' development requires synergy between the government and universities to succeed optimally [4].

2. Method

Based on the existing problems, the activities carried out to overcome these problems can see in Table 1 below.

| Table 1. List of activities for partners |
|----------------------------------------|
| **Partners I**                        | **Partners II**                           |
| Fabrication of a drying oven          | Administration and showroom arrangement   |
| Purchasing the showroom furniture     | Purchasing the showroom furniture          |
| Purchasing the production equipment   | Purchasing the production equipment        |
| Updating website                      | Updating website                           |
| Making brochures and product catalogs | Making brochures and product catalogs      |
| Fabrication process training          | Fabrication process training               |
| Training drafting contract drafting   | Training drafting contract drafting        |

This service activity consists of two main activities: the transfer of skills and knowledge and technology transfer. According to partners' needs, skills and knowledge transfer activities to transfer some knowledge and skills. This activity pursues using training and mentoring. Meanwhile, technology transfer is an activity related to the transfer of several appropriate machinery and equipment to increase production quality and quantity. This activity pursues by the method of procurement (purchase) and manufacture.

3. Result and Discussion

The problems based on prioritized to resolved, the activities have been carried out, and the results so obtained are as follows:

| Table 2. Results of activities that have achieved |
|--------------------------------------------------|
| **Partners**          | **Activity**                          | **Result**                      |
| Administration and showroom arrangement   | The administration room and showroom are tidier and more organized |
| I Procurement of showroom furniture | Seven partner product display racks Signboard |
| Procurement of production equipment | One welding inverter unit |
|                               | One unit of multi-functional grinding machine |
Prinx Mas SME

Activities for Prinx Mas SME are focused on marketing efforts. These activities consist of rehabilitation and arrangement of the showroom, making display racks, making brochures and product catalogs, updating name boards, updating SME websites, and making video production processes. In the showroom or showroom’s rehab activity and arrangement, the rehab is first carried out, namely patching the broken walls, repairing the ceiling, repairing the room floor, and painting all the showroom walls. After the rehabilitation, the next activity is the arrangement of the showroom. Besides that, a craft product display rack makes to complement the showroom tools, totaling eight units.

Showroom equipment, product catalogues and marketing brochures were made in order to increase sales. The brochures printed were 2500 pcs and the catalogue were 50 pcs. In addition, the Prinx Mas SME name board were replaced with a new and attractive one. Prinx Mas SME website were also updated in order to attract customers. We can access their website atpringmasbambubrajan.com. This website made without coding and directly online [5]. Website updating activity is one of the way to promote the products online. In this era, online product marketing is a must where almost all of activities in the world are carried out online [6]. Anyone in the world can see the products we deliver through online marketing. Online marketing allows customers and sellers or craftsmen to be able to relate and communicate directly so that the profit obtained could be maximum. In addition, videos of the production process are also made as a means of marketing and media for publication. This video is uploaded to Prinx Mas official website and youtube. Some of the production equipments needed like welding inverter machine and a multi-function grinding machine were also given to Prinx Mas SME in order to increase their productivity.
Observation of partner productivity development is observed after service activities are carried out. Observations on the development of SME partners Prinx Mas until October 2019 showed production capacity increased by 11% (from 900 to 1000 units / month), income turnover increased by 8.75% (from 32 million to 34.8 million / month) and assets increased by 4.5% (from 660 million to 690 million).

Prinx Gedhe SME

The service activities at Prinx Gedhe SMEs focused on solving problems in the field of increasing production capacity. This effort realized by providing several production equipments which were really needed by the partners. The equipments consist of 1 unit of drying oven, 1 unit of multi-function grinding machine and 1 unit of inverter welding machine.

a. Drying oven

The oven that was handed over to Prinx Gedhe SME was an oven designed and made in the machining workshop of the Mechanical Engineering Education Department, Universitas Negeri Yogyakarta. The making of this oven involved a technician and 4 students. This product is a student's final project work which is very helpful in their graduation process. The oven has a size of 120 x 60 x 200 cm and was designed using a frame material from a rectangular pipe and the walls were made of base plate with a thickness of 1.8 mm. This oven used a 1 burner stove with LPG gas fuel which can reduce air pollution. Heat-resistant foam was installed on the entire inner wall of the oven so that the heat that was directed into the oven will not spread to the oven walls. This results in a more efficient and maximum heating process in the oven. This has the effect of achieving the ideal temperature for drying bamboo products in a relatively short time. The average temperature used to dry bamboo products is around 40 to 50 degrees Celsius.

Observations were made to determine the effectiveness of the oven in the product drying process. The observations show that for one time the oven process of bamboo handicraft products with a temperature range between 40 and 50 degrees Celsius, the dry product takes 3-4 hours. However, if the drying is done manually in the hot sun, it must be dried for at least 2 days. In addition, for the consumption of LPG gas for the drying process, one 3 kg tube can be used for oven up to 8 times (assuming each oven takes an average of 4 hours). The price of a 3 kg gas cylinder currently in Indonesia is quite cheap, around Rp. 36,000.00 so that this will not burden the SME in financing. This oven is not equipped with a blower to push hot steam because it is feared that hot steam will disappear more quickly when blown.
using a blower. Based on this, it is clear that the existence of this dryer is very much needed, especially in the rainy season because for products that do not have a maximum level of dryness, the product will easily mold.

b. Multi-function Grinding Machine
Grinding machines can make in machining and fabrication workshops at the Faculty of Engineering, Yogyakarta State University. Making this machine involves two students and, at the same time, becomes their final project. This machine calls multi-functional because, in addition to its primary function for grinding, it can also use for sanding and cutting/sawing wood and bamboo. Machine construction makes it simple to make it easy to operate and also in the maintenance process. With the addition of this machine, several production processes can be quick. This machine uses a motor that has a power of ½ PK with a rotation of 1400 rpm. So that with the use of this machine, it will not burden partners, especially in financing the electric power used.

c. Inverter Welding Machine
Welding inverters can obtain by direct procurement. This seconded Inverter Welding machine requires a maximum electric power of 900 watts. The electric power required for this welding inverter's operation is relatively small, so partners will not burden electrical power problems. This welding inverter helped solve problems, especially in the formation and connection of metals, where this metal material is the mainframe of some of the handicraft products produced. Having a welding inverter will reduce production costs, because before having a welding inverter, the partner ordered this frame from a welding workshop, and the price was relatively high. So that by having this welding inverter independently, it can increase partner productivity without burdening production costs, especially related to the cost of electric power.

Figure 3. Handover of the grinding machine and oven

From the activities that have been carried out, especially in support of increasing productivity, it can observe that the development that has been achieved by the Pring Gedhe SME, namely production capacity, increased by 8.8% (from 850 to 925 units/month), income turnover increased by 7.3% (from 36.8 million to 39.5 million/month), assets increased by 4.8% (from 620 million to 650 million).

4. Limitations
The limitation in implementing this activity is the partners' confidence, especially in applying the sale and purchase agreement. Partners are afraid that prospective customers will go to find other artisans when this agreement letter implement.

5. Conclusion
Based on the results in activities that have achieved, the conclusions that can draw are as follows:
a. Prinx Mas SME has achieved developments, namely:
   1) Production capacity increased by 11%.
   2) Income turnover increased by 8.75%.
   3) Assets increased by 4.5%.

b. Quantitatively, the developments that have been achieved by the Pring Gedhe SME are:
   1) Production capacity increased by 8.8%.
   2) Revenue turnover increased by 7.3%.
   3) Assets increased by 4.8%.

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