Entrepreneurial Spirit and Skill of Women Farmers at Wonokerto, Indonesia (The Role of Organic-Processed Food Education and Training)

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Abstract

This research assessed the role of organic-processed food education and training (made of snake-fruit and arrowroot) toward entrepreneurial spirit and skill of women farmers at Wonokerto. This research compared treatment between women farmers at Wonokerto who join organic-processed food education and training and those who do not join the program. The analysis instrument is MANOVA (Multivariate Analysis of Variance) with T- Hotelling test. The result reveals that the skill average of women farmers at Wonokerto is higher on those who join education and training program than those who do not join; meanwhile, the average on entrepreneurial skill of women farmers at Wonokerto shows no difference. However, the partial analysis result on entrepreneurial spirit variable related to alertness, optimistic, persistent, and realistic indicators demonstrates greater result for those who join the program compared to those who do not join; whereas, openness for those who do not join the program is greater than those who join the program. We conclude that organic-processed food education and training partially affects on the improvement of skill and entrepreneurial spirit of women farmers at Wonokerto. We recommend intensive entrepreneurship education and training to enhance entrepreneurship among women farmers at Wonokerto.

Introduction

Women farmer is part of farmer family. Most women farmers assist their husband’s job in farming commonly in rural areas of Indonesia, particularly at Wonokerto village. They help to find grass for their livestocks’ feed. Some others is weeding sugar cane plantation or snake-fruit yard; they also responsible for domestic (household) tasks. Those are traditional roles of women as supporting partner of her husband (Javanese term: kanca wingking). There is a difference on social role and function; yet, women should handle multiple roles in their family such as earned additional income for their family (Azahari, 2008).

Based on the survey, 71.9% women farmers at Wonokerto have quite low formal education level. Their knowledge on the development of local plant potential is also limited. Local plants such as snake-fruit and arrowroot are categorized into organic plants which are environmental friendly (Field and Oliweler, 2002; Daly and Farley, 2009; Padel et al., 2009; Saragih, 2010). In fact, at Wonokerto, the product of snake-fruit and arrowroot during the harvest time suffers from extremely cut rate price about Rp. 1.000 to 2.000 rupiah per kg. Moreover, the product cannot be naturally preserved in a long time (it is got rotten relatively in short period after harvesting). Those problems are the main hindrances; thus, it needs further processing, such as snake-fruit kurma-like candy or called as Salacca dates. The price will be elevated to Rp. 50.000 – 60.000 per kg. This processed-product will be preserved longer than just a fresh fruit (until 7 months). However, Wonokerto’s Salacca dates are not well-known yet. Furthermore, only a few farmer families are able to produce Salacca dates. Arrowroots also faces similar problem. It is only processed to be arrowroot flour during Muslim’s holiday. Although the price of arrowroot flour reaches Rp. 20.000 – 25.000 per kg, it is difficult to market the product since it’s more expensive than the local market price in Bantur. However, Multifiah (2011) explained that women farmers at Wonokerto have more spare time to develop their skill.
Skill development of the women farmers is not instantly formed. It should involve training and education. Specifically, education and training which is relevant with Wonokerto local resource potential should be also used organic snake-fruit and arrowroot plants. They need to alter their mindset to encourage their entrepreneurial spirit (Kumalaningsih, 2008). There should be an action to encourage them to do experiment on producing processed-food made of snake-fruit and arrowroot. If successful, it will raise their self-confidence which in turn will also gather their self-reliance (UN, 2007). Technology training related to food processing is part of human resource development which motivates women farmers to be entrepreneurs (Leinbach, 2004; Quisumbing and Pandolfelli, 2010). Thus, micro and small businesses of women farmers need to be promoted to enhance sustainable job opportunity (UN, 2007). Entrepreneurial spirit development for women farmers needs motivator that understands their character and personality. An effort to achieve women farmers’ empowerment is education which enhances their skill (McElwee, 2005). Hence, education to improve the skills of women farmers has a crucial role to help them to be entrepreneur candidates (Collet and Gale, 2009). The important reason to conduct this research is to assess the effort of improving entrepreneurial spirit and skill of women farmers at Wonokerto by organic-processed foods (snake-fruit and arrowroot) education and training. We expected that it will improve the farmer family’s income.

Theoretical Review:

Vroom’s Expectancy Theory stated that an individual’s behavior is motivated by the expectation toward particular result (Robbins, 1996). Behavior is also a function of relationship between personal trait and environmental variables. Entrepreneurial spirit is the characteristic of entrepreneurial spirit (Audresch et al., 2001). According to the perception of the training participants, they perceive the benefit of the entrepreneurial spirit of Wonokerto women farmers who join the program (Kumalaningsih, 2008). The behaviors of most entrepreneurs have been observed in California, USA, Alma (2009) found that there are 24 indicators that affect the behavior, including: self-confidence, optimistic, leadership, finance management, imagination, ability to make a plan, patient, firm, spirit, responsible, hard-working, encouragement for achievement, realistic, organizational, precision, calmness, risk calculation, physical health, good communication, freedom, sociable, and able to make a decision. Basically, entrepreneurship is the result of interaction, integration, reflection idea, expectation, and inter-individuals relationship. Learning that aimed to encourage entrepreneurship is to support entrepreneurial activities (Priyanto, 2009). In Southern Malaysia, women successful are affected by family support, social relationship, and internal motivation. Otherwise, Information Communication Technology (ICT) does not have any direct effect (Alam, 2011).

Other study explained the influence factors on entrepreneurial spirit are external factor and internal factors, such as education/training and the surrounding environment (Wibowo, 2011). It corresponds to the convergence theory proposed by Walgito (2004). Entrepreneurial training has been conducted to the women population in rural area in Greece. Based on the perception of the training participants, they perceive the benefit of the training on their skill advancement (Petridou and Glaveli, 2008). Therefore, education and training are inter-related. According to UNESCO, education is tightly corresponds to the development of knowledge and understanding; meanwhile, training aims to improve skills (Kamil, 2010).

Education and training on organic-processed food is arranged to improve the knowledge and skill of women farmers at Wonokerto to produce processed-food made of snake-fruit and arrowroot which are environmental friendly. It is an effort to enhance the additional economic value of the product. We assumed it has a correlation with entrepreneurial spirit and skill of women farmers to define the success of the program. The course materials delivered during the program in organic-processed food consist of: (1) economy-ecology knowledge about environmental friendly product, (2) knowledge of organic agriculture, and (3) practice to produce organic-processed food. Next, women farmers had a chance to make an experiment (trial) in producing organic-processed foods which are made of snake-fruit and arrowroot. The products’ outcome then evaluated based on the creativity level of innovation (Fig. 1).

Our conceptual framework proposed two hypotheses. H1: Wonokerto women farmers who join the program have higher entrepreneurial spirit than who do not join the program. H2: Wonokerto women farmers who join the program have greater skill than those who do not join the program.

The problem is about the low education level and knowledge among Wonokerto women farmers to develop organic plants (e.g. snake-fruit and arrowroot) to be preferable processed-foods. Hence, the significance of this research is to analyze the program role of organic-processed food education and training toward the development of entrepreneurial spirit and skill of Wonokerto women farmers. The objectives of this research are: (a) identify the factors on entrepreneurial spirit and skill of Wonokerto women farmers, (b) describe the variables of identified factors on entrepreneurial spirit and skill of Wonokerto women farmers, and (c) analyze...
the differences of entrepreneurial spirit and skill of Wonokerto women farmers between those who participate the program and those who do not participate.

We expected to contribute in providing an insight for women farmers to enhance the additional economic value of the organic snake-fruit and arrowroot, and a feedback to the policy maker (relevant institution to the society/ population empowerment) to intensify organic-processed food education and training program.

![Conceptual Framework](image)

**Fig. 1: Conceptual Framework.**

**MATERIALS AND METHODS**

We used experimental approach design in this research. Arikunto (1997) stated that good type of experiment is experiment technique that uses the control group, which is not treated. This research consisted of experiment group and control group (Sekaran, 2007). We observed the program’s role of education and training on organic-processed food for the group which received treatment and the other group which did not receive any treatment.

**Study Area:**

Malang Regency is located in East Java province, Indonesia. The area is located in the mountainous areas with coordinates of East Longitude 112°17'10,90” - 122°57'00,00” and South latitude 7°44'55,11” - 80°26'35,45”. Malang is directly adjacent to Jombang, Mojokerto and Batu. It is also adjacent to Pasuruan on the north, Lumajang in the east, the Indian Ocean in the south, Blitar and Kediri in the west. Malang is known as one of the main tourist destination in East Java, where Wonokerto village located (in the Bantur District of Malang), with 1.044 ha width. North area is verge with Lesti River, south with Rejosari Village, west with Rejoyoso Village and east with Sumberjo Village.

**Data Collection:**

The sampling used probability sampling technique of Sugiyono (2011) with the population of women farmers that joined the program. The name of the program is “Integrated Science and Technology Diffusion Program on Sustainable Farming, Live-Stocks, Fishery, and Energy Acceleration” by Agustina (2007). Sulistiyanto (personal interview, 2013) as key informant in neighborhood association explain on the practice of biogas energy made of cow’s manure and the practice on organic vegetable, chicken, and fish cultivation. The sample is taken from the population of the two neighborhood associations. However, only a total of 39 persons are willing to actively join the education and training program and to completely fulfill the distributed questionnaire.

Group 1 consisted of women farmers from Rukun Tetangga (neighborhood association) 13 who received education and training on organic processed-food. Group 2 consisted of women farmers at Rukun Tetangga 11 who did not participate the program. Variable as research’s object (Arikunto, 1997) are entrepreneurial spirit and skill of women farmers. We used questionnaire to collect the data, which included five alternative answers based on the 1 to 5 Likert’s scale (Sugiyono, 2011). The entrepreneurial spirit data consisted of 24 indicators, while the skill data consisted of 13 indicators.

**Data Analysis:**

**Factor Identification of Entrepreneurial Spirit and Skill of Women Farmers at Wonokerto:**

We used factor analysis to identify the factors in this research. Factor analysis was used to summarize information into a set of a new variant (factor). Bartlett of Sphirty test applied to determine the correlation between variables and resulted significant. Measure of Sampling Adequacy (MSA) showed the value of > 0.50 (Ghozali, 2011). Variables grouping interpret the factor with loading factor ≥ 0.4 which becomes new factor and is given a new factor name (Malhotra, 1993). This research used descriptive analysis to describe the result of factor analysis on the new formed variable. The variable consisted of cluster on entrepreneurial spirit and skill indicators on women Wonokerto farmers.
Multivariate Analysis of Variance (MANOVA):

$T^2$ Hotelling test is a statistical analysis technique to reveal the difference between two groups of population which have two or more dependent variables – in multivariate analysis of variance (MANOVA) (Hair et al., 2009). The prerequisite to use $T^2$ Hotelling test for the two groups of the observed sample should fulfill the following assumptions: (a) the data sample has at least interval scale, (b) the sample has normal distribution, and (c) the sample has homogenous data covariance (Purnawirawan and Mahmudah, 2007). The instrument to analyze the homogeneity assumption is Levene’s Test with the score $> 0.05$ (Ghozali, 2011). Assumption of multivariate normality is each variable (factor) in normal distribution defined with Kolmogorov-Smirnov test. Each variable of entrepreneurial spirit that consisted of alertness, optimistic, realistic, persistent, and openness is analyzed partially by using normal Q-Q plot and marginal mean were estimated.

Validity and Reliability of the Instruments:

We checked the validity and reliability of the instrument on the entrepreneurial spirit and skill of Wonokerto women farmers before processed further into the analysis. The validity test is based on the bivariate correlation between the score of each instrument and the total score which must be significant. The instrument with Cronbach Alpha score $> 0.60$ is reliable (Ghozali, 2009). The result reveals that all of the entrepreneurial spirit and skill variables are valid and reliable (0.958 and 0.916).

Result:

Factor Identification on Entrepreneurial Spirit and Skill of Women Farmers:

The factor identification on entrepreneurial spirit and skill of Wonokerto women farmers has met the requirement of MSA score, i.e. 0.774 and its Bartlett of Sphery is significant (0.000). Factor analysis on entrepreneurial spirit variable is resulted in five factors; each factors composited of several indicators which obtained the greatest scores (Table 1, printed in bold).

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Self-confident</td>
<td>0.392</td>
<td>0.424</td>
<td>0.024</td>
<td>0.602</td>
<td>0.012</td>
</tr>
<tr>
<td>2.</td>
<td>Optimistic</td>
<td>0.235</td>
<td>0.158</td>
<td>0.222</td>
<td>-0.027</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Leadership</td>
<td>0.297</td>
<td>0.718</td>
<td>0.365</td>
<td>0.076</td>
<td>0.159</td>
</tr>
<tr>
<td>4.</td>
<td>Financial management</td>
<td>0.312</td>
<td>0.540</td>
<td>0.333</td>
<td>0.167</td>
<td>0.384</td>
</tr>
<tr>
<td>5.</td>
<td>Imagination/Creativity</td>
<td>0.266</td>
<td>0.478</td>
<td>0.822</td>
<td>0.228</td>
<td>-0.019</td>
</tr>
<tr>
<td>6.</td>
<td>Able to make a plan</td>
<td>0.082</td>
<td>0.733</td>
<td>0.362</td>
<td>0.105</td>
<td>0.228</td>
</tr>
<tr>
<td>7.</td>
<td>Patient</td>
<td>0.042</td>
<td>0.187</td>
<td>0.358</td>
<td>0.740</td>
<td>0.217</td>
</tr>
<tr>
<td>8.</td>
<td>Firm</td>
<td>0.195</td>
<td>0.394</td>
<td>0.492</td>
<td>0.469</td>
<td>0.353</td>
</tr>
<tr>
<td>9.</td>
<td>Persistent</td>
<td>0.291</td>
<td>0.188</td>
<td>0.103</td>
<td>0.796</td>
<td>0.290</td>
</tr>
<tr>
<td>10.</td>
<td>Responsible</td>
<td>0.087</td>
<td>0.716</td>
<td>0.253</td>
<td>0.267</td>
<td>0.331</td>
</tr>
<tr>
<td>11.</td>
<td>Hard Working</td>
<td>0.390</td>
<td>0.101</td>
<td>0.164</td>
<td>0.612</td>
<td>0.301</td>
</tr>
<tr>
<td>12.</td>
<td>Encouragement for achievement</td>
<td>0.328</td>
<td>0.433</td>
<td>0.297</td>
<td>0.173</td>
<td>0.185</td>
</tr>
<tr>
<td>13.</td>
<td>Integrity</td>
<td>0.621</td>
<td>0.222</td>
<td>0.315</td>
<td>0.276</td>
<td>0.338</td>
</tr>
<tr>
<td>14.</td>
<td>Self-reliance/Openness</td>
<td>0.211</td>
<td>0.090</td>
<td>0.096</td>
<td>0.424</td>
<td>0.784</td>
</tr>
<tr>
<td>15.</td>
<td>Realistic</td>
<td>0.357</td>
<td>0.177</td>
<td>0.740</td>
<td>0.351</td>
<td>0.133</td>
</tr>
<tr>
<td>16.</td>
<td>Organizational</td>
<td>0.155</td>
<td>0.354</td>
<td>0.682</td>
<td>0.174</td>
<td>0.032</td>
</tr>
<tr>
<td>17.</td>
<td>Precision</td>
<td>0.681</td>
<td>0.338</td>
<td>0.003</td>
<td>0.327</td>
<td>0.076</td>
</tr>
<tr>
<td>18.</td>
<td>Calmness</td>
<td>0.004</td>
<td>0.495</td>
<td>0.069</td>
<td>0.249</td>
<td>0.438</td>
</tr>
<tr>
<td>19.</td>
<td>Risk Calculation/Alertness</td>
<td>0.035</td>
<td>0.123</td>
<td>0.179</td>
<td>0.082</td>
<td>0.254</td>
</tr>
<tr>
<td>20.</td>
<td>Physical health</td>
<td>0.823</td>
<td>0.092</td>
<td>0.280</td>
<td>0.193</td>
<td>-0.064</td>
</tr>
<tr>
<td>21.</td>
<td>Good Communication</td>
<td>0.271</td>
<td>0.320</td>
<td>0.232</td>
<td>0.213</td>
<td>0.698</td>
</tr>
<tr>
<td>22.</td>
<td>Freedom</td>
<td>0.745</td>
<td>0.160</td>
<td>0.148</td>
<td>0.124</td>
<td>0.270</td>
</tr>
<tr>
<td>23.</td>
<td>Sociable</td>
<td>0.633</td>
<td>0.194</td>
<td>0.210</td>
<td>0.214</td>
<td>0.580</td>
</tr>
<tr>
<td>24.</td>
<td>Able to make a decision</td>
<td>0.161</td>
<td>0.239</td>
<td>0.741</td>
<td>-0.026</td>
<td>0.342</td>
</tr>
</tbody>
</table>

The result of factor analysis on the skill of Wonokerto women farmers has also met the requirement of MSA (0.790) and significant (Bartlett of Sphery = 0.000). The factor analysis of skill variable is measured by using 13 indicators that resulted in 3 factors. Each factor is composed by several indicators which obtain the highest scores compared to the other indicators (Table 2). Each factor that construct entrepreneurial spirit and skill variables of Wonokerto women farmers described further based on the represent characters (Table 1 and 2).

Factor analysis creates new factors which then become variable’s attributes. There are five factors for entrepreneurial spirit variable: alertness to calculate profit, optimistic and creative, realistic, persistent and openness. The finding of entrepreneurial spirit of women farmers is represented by those five factors. There are three factors for skill variable, i.e. skill, non formal education knowledge, and formal education knowledge.

Entrepreneurial Spirit of Women Farmers:

The indicators of entrepreneurial spirit are clustered into five groups (Table 1). Factor 1 is consisted of encouragement for achievement, integrity, precision, calmness, risk calculation, physical health, freedom, and
sociable. Ghozali (2009) explained that in the factor analysis, an indicator that obtained the highest score can represent the factor’s attribute. The highest score indicator (0.835) for Factor 1 is the attitude of risk calculation. Informants mentioned that they alert toward their business whether it will be profitable or not.

Table 2: Weighting Score of Skill Variable.

<table>
<thead>
<tr>
<th>No.</th>
<th>Indicator</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Formal Education/School Duration (year)</td>
<td>0.034</td>
<td>0.069</td>
<td><strong>0.900</strong></td>
</tr>
<tr>
<td>2.</td>
<td>Non Formal Education/Training (Attendance Frequency)</td>
<td>0.195</td>
<td>0.720</td>
<td>0.263</td>
</tr>
<tr>
<td>3.</td>
<td>Understand agriculture with non-synthetic chemical substance</td>
<td>0.201</td>
<td>0.727</td>
<td>0.185</td>
</tr>
<tr>
<td>4.</td>
<td>Know about organic plants</td>
<td>0.795</td>
<td>0.206</td>
<td>0.362</td>
</tr>
<tr>
<td>5.</td>
<td>Know about natural-processed food</td>
<td>0.796</td>
<td>0.289</td>
<td>0.117</td>
</tr>
<tr>
<td>6.</td>
<td>Know about healthy cook</td>
<td>0.230</td>
<td></td>
<td><strong>0.829</strong></td>
</tr>
<tr>
<td>7.</td>
<td>Know about environment degradation problems</td>
<td>0.310</td>
<td></td>
<td>0.032</td>
</tr>
<tr>
<td>8.</td>
<td>Know about how to protect environment sustainability</td>
<td>0.305</td>
<td>0.766</td>
<td>0.142</td>
</tr>
<tr>
<td>9.</td>
<td>Know about the benefit of green restoration plant</td>
<td>0.299</td>
<td>0.401</td>
<td>0.682</td>
</tr>
<tr>
<td>10.</td>
<td>Know about the benefit of snake-fruit as refined food’s material</td>
<td><strong>0.895</strong></td>
<td>0.335</td>
<td>0.121</td>
</tr>
<tr>
<td>11.</td>
<td>Know about the benefit of arrowroot as refined food’s material</td>
<td>0.836</td>
<td>0.440</td>
<td>0.121</td>
</tr>
<tr>
<td>12.</td>
<td>Easy to produce processed-food made of snake-fruit</td>
<td><strong>0.832</strong></td>
<td>0.362</td>
<td>-0.050</td>
</tr>
<tr>
<td>13.</td>
<td>Easy to produce processed-food made of arrowroot</td>
<td><strong>0.849</strong></td>
<td>0.093</td>
<td>0.060</td>
</tr>
</tbody>
</table>

Indicators in Factor 2 consisted of optimistic, leadership, financial management, able to make a plan, and responsible. The highest score (0.825) among the indicators is optimistic. Basically, Wonokerto women farmers believe that their business will bring profit for their family.

Otherwise, Factor 3 consisted of imagination/creativity, firm, realistic, organization and able to make a decision. The factor analysis on Factor 3 concludes that realistic and able to make a decision are the highest score indicators among others (0.740 and 0.741, respectively). Wonokerto women farmers making their decision based on realistic thought (reality). It is proven by the recent low price of snake-fruit that causes some farmers decided to switch to other plants which are perceived to be more profitable.

Factor 4 consisted of self-confidence, patient, persistent, and hard-working indicators. The highest score (0.796) is obtained by persistent indicator. In fact, Wonokerto women farmers have quite great spirit to encourage business interest.

The last, Factor 5 consisted of self-reliance and good communication with others. The highest score is obtained by self-reliance indicator (0.796). Self-reliance in the context of women Wonokerto farmers is interpreted as voluntary awareness. When there is a traditional ceremony without formal invitation, they will still attend whether they are formally invited or not. The traditional ceremonies can be pengajian (Holy Quran Citation), New Baby Born, Funeral, or Marriage. The information usually received through gethok tular (oral invitation). It implies their openness characteristic. Supardjo and Paterson (2005) confirmed that Javanese local culture still acknowledges gethok tular as a communication medium.

Entrepreneurial Skill of Women Farmers:

Factor 1 includes the indicator of know about organic plants, natural-processed food, the benefit of snake-fruit and arrowroot as refined food’s material, easy to produce processed-food made of snake-fruit and arrowroot. There are four indicators which scored > 0.8 in Factor 1, i.e. 0.895, 0.836, 0.832 and 0.849. It describes the knowledge of Wonokerto women farmers related to snake-fruit and arrowroot as the material to produce refined-food. The skill of women farmers at Wonokerto is related to the production of organic processed-food made of snake-fruit and arrowroot.

Factor 2 of skill variable consisted of attendance frequency in organic-processed food education and training, understand agriculture with non-synthetic chemical substance; know how to cook healthy, know the problem of environment degradation, and know how to protect environment sustainability. There are two scores of indicators that > 0.8, i.e. 0.829 for know how to cook healthy and 0.801 for know the problem of environment degradation. Respondents are familiar with those activities when there was an Integrated Science and Technology Diffusion Program on Sustainable Farming, Live-Stocks, Fishery, and Energy Acceleration at Wonokerto conducted by Agustina and team (2007). The program ran in 3 years and provided sufficient knowledge for the respondents related to environmental issues.

Otherwise, Factor 3 includes indicators of formal education and knowing the benefit of green restoration plant. The highest score (0.900) is obtained by formal education which is supported by the length of the formal education. It implies that formal education is highly important for women farmers at Wonokerto in improving their ability. It is relevant with Kamil (2010) that stated education developed the overall abilities including cognitive, affective, and psychomotor aspects.

In sum, the indicator cluster of Factor 1 represents skill to produce organic-processed food; the indicator cluster of Factor 2 represents comprehension on environment sustainability; and indicator cluster of Factor 3 represents skill based on formal education.
Discussion:

**Difference on Entrepreneurial Spirit and Skill among Women Farmers:**

Entrepreneurial Spirit Variable:

Kolmogorov-Smirnov test displayed that all factors have $p > 0.05$. The scores of alertness, optimistic, realistic, persistent, and openness are 0.736, 0.511, 0.319, 0.807 and 0.842 respectively. It means that the five factors of entrepreneurial spirit spread normally; thus, it meets normality assumption.

The other assumption that should be met is equality of variances. The result on Levene test equality of variances concludes that all of the entrepreneurial spirit factors have $p > \alpha$ (0.05). Each of the factor scores 0.516 for alertness, 0.367 for optimistic, 0.460 for realistic, 0.565 for persistent, and 0.842 for openness. Since all of the basic assumptions which are required by $T^2$ Hotelling test are met, this assessment can be applied to the entrepreneurial spirit factors.

The $T^2$ Hotelling test result on education and training participation toward entrepreneurial spirit indicates the $p$ Hotelling’s Traces of 0.483 ($> \alpha = 0.05$). Statistically, the entrepreneurial spirit condition between those who join organic-processed food training and education and those who do not join the program are similar. There is no difference between those two groups. It means that H1 is rejected (the result comes from the entrepreneurial spirit variable which is measured based on its mean score).

Q-Q Plot and marginal mean estimated that all of the variables exhibit normal curve. The plot profile showed that alertness, optimistic, realistic, and persistent of Wonokerto women farmers who join education and training program are higher than those who do not join the program. However, openness of women farmers who do not join the education and training program is higher as compared to those who join the program (Fig. 2).

Mean value showed entrepreneurial spirit of women farmers between those who join the program and those who do not join the program are equal. However, in fact of a deeper observation, women farmers who join education and training program are likely to work themselves – they become less openness. For instance, if there is a woman farmer who gets an order to produce organic-processed food product, she tends to do it herself without informing the others. It implies that they can produce the product by themselves (self-reliance). According to Drucker (2007), an entrepreneur should have self-reliance. Thus, it concludes that organic-processed food education and training is able to increase entrepreneurial spirit of women farmers at Wonokerto who become the participants of the training and education program.

This research is similar with the result of a research that conducted on rural women in Greece (Petriou and Giaveli, 2008) which concludes that business success is tightly correlated to skill, motive, and attitude of the entrepreneur. The other research demonstrates that education is one of the factors which cause significant impact on entrepreneurial innovative behavior (Babalola, 2009).

The results indicate that Wonokerto women farmers have openness attitude in their communication. Their way of communication is affected by local Javanese culture (Supardjo and Peterson, 2005) by using gethok tular – oral communication strategy. This culture arranges a type of communication from one person to another which spreads through particular local events such as arisan (social gathering) or pengajian (Holy Quran Citation). Hence, the value of openness for those who do not join the program is statistically higher than those who join the program (Fig. 2). Moreover, the number of respondents who do not join the program is greater than the respondents who join it. The openness characteristic is found when the researcher goes deeper down on self-confidence indicator as mentioned in Alma (2009) entrepreneurship theory. As what occurs on the rural entrepreneurs in southern Malaysia, women farmers also do not utilize much communication technology (Alam, 2011). This condition resembles the rural circumstance in Indonesia, particularly in Wonokerto-Malang.

![Fig. 2: The profile plot of Women Farmer’s entrepreneurial spirit factors at Wonokerto.](Image)
Skill Variable:

The $T^2$-Hotelling test result on each skill variable (factor) has met the assumption of multivariate normal distribution as proven by all of the skill’s factors have $p > 0.05$. Skill to produce organic processed food, comprehension on environment sustainability, and skill based on formal education achieved 0.223, 0.788, and 0.559, respectively. It confirms that the three factors of skill spread normally. The Levene test result on overall factors of skill should be $p > \alpha$ (0.05). Each factor achieved 0.974 for skill to produce organic-processed food, 0.082 for comprehension on environment sustainability, and 0.232 for skill based on formal education. Further, the Hotelling’s Trace result obtains the $p$ score of 0.000, which is less than $\alpha$ (0.05), which means it’s significant.

It is revealed on normal Q-Q plot and estimated marginal mean of each factor (skill to produce organic-processed food, comprehension on environment sustainability, and formal education) that elucidate the assumptions requirement. Normal Q-Q plot indicates that the skill of women farmers who join the training and education program is greater than who do not join the program.

The hypothesis test result on skill variable between those who join the program and those who do not join the program demonstrates different result. It implies that skill of the respondents who join the program is greater than those who do not join the program. Therefore, hypothesis 2 (H2) is accepted since women farmers who join the education and training program exhibit better skill compared to those who do not join the program.

Organic-processed food education and training is related to the production of syrup that made of snake-fruit dates’ residue. The syrup is then packaged in a sterilized bottle. The instructor demonstrates the standard operational procedure to sterilize syrup bottle as shown in Fig. 3.

![Fig. 3: The process of bottle sterilization to package snake-fruit syrup.](image)

(a) Instructor explanation; (b) bottle sterilization; (c) packaging the snake-fruit syrup into the bottle.

The training is continued by producing processed-food, i.e. snake-fruit dates. The term is snake-fruit date due to the end-product has similar shape like palm-dates (Fig. 4a). The training also included the production of organic-processed food made of arrowroot which is called as emping garut (arrowroot chips). The arrowroot chips are fried by using palm-oil (Fig. 4b).

![Fig. 4: Organic-processed food: (a) Snake-Fruit (Salacca) dates; (b) Emping Garut (Arrowroot Chips).](image)
Implementation) also provide training for the farmers (Prasad, 2006). The motive of rural women in micro business – which is based on their ability, technical skill and family support – is to have more income for their family (Jena, 2012). Improved knowledge and comprehension on sustainable (organic) agriculture among Wonokerto women farmers is achieved by Integrated Science and Technology Diffusion Program by socializing the procedure to cultivate organic vegetable, organic fish and chicken, and bio-gas production (Agustina, 2007).

Conclusion:
Factor analysis concluded that 24 indicators of entrepreneurial spirit among Wonokerto women farmers are clustered into five factors which consisted of alertness to calculate profit, optimistic, realistic, persistent, and openness. On the other hand, 13 indicators of skill variable are clustered into three factors which consisted of skill on producing organic-processed food, comprehension on environment sustainability, and formal education.

The description on entrepreneurial spirit of Wonokerto women farmers includes alertness which is interpreted as they always calculate whether it will be profitable or not. The factor is dominant among women farmers that observed in the research scope. Besides that alertness is also supported by optimistic, realistic, and openness. Essentially, women farmers have alertness to prevent less-beneficial condition. They optimist but realistic which is supported by a willingness to be better in their self-reliance. It will encourage resilient entrepreneurs. Considering their openness among both Wonokerto women farmers who join and do not join the program, it supports an informal information distribution channel called as gethok tular (oral communication) during particular local events such as arisan (social gathering) and pengajian (Holy Quran Recitation). It indicates the harmony among village societies as the Indonesian culture. The difference of women farmers between those who join education and training program and those who do not join the program is on self-reliance. After joining organic-processed food education and training, women farmers are capable of being self-reliant. It means that they are able to produce organic-processed food by themselves. Skill variable comprises of non formal education, skill to produce organic-processed food, and comprehension on environment sustainability. Formal education level of the respondents comprehended and sufficient for producing the organic-processed food made of snake-fruit and arrowroot.

There is no difference on the entrepreneurial spirit neither joins nor do not join the program. It is presumed by the high openness characteristic of women farmers who do not join the program compared to those who join the program. Otherwise, the alertness, optimistic, realistic, and persistent characteristics are greater for women farmers who join the program than those who do not join the program. However, the average score test demonstrates that there is no difference on entrepreneurial spirit for both groups who join and do not join the program. It implies that the openness of women farmers who do not join the program is quite high. It concludes that women farmers who join the program have greater self-reliance. In term of skill, there is a difference between women farmers who join and who do not join the program. Therefore, organic-processed food training and education has been success in improving the skill of women farmers who join the program.

Suggestion:
We suggest further research to reveal the correlation between entrepreneurial spirit and skill variables among women farmers. It is essential to conduct effective entrepreneurship training to improve entrepreneurial spirit of Wonokerto women farmers. The availability of organic snake-fruit and arrowroot plants that have been preserved generation to generation should be retained for maintaining environment sustainability. This effort will develop the economic potential of Malang Regency (Indonesia) and support tourism sector in that region.

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