THE EFFECTIVENESS OF DEMONSTRATION AND EXPERIMENTATION LEARNING METHODS FOR EMPOWERING PINE FOREST COFFEE FARMERS BENDOSARI VILLAGE PUJON-MALANG INDONESIA

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ABSTRACT
An effective learning method is very important for the success of a learning goal, especially for the success of learning that involves the village community. The village communities have very diverse abilities and knowledge, in general an activity is carried out in accordance with daily habits, so it is not easily changed. However, the villagers already have a lot of experience, especially related to their daily livelihoods. The characteristics of such objects require an effective learning innovation in order to increase the knowledge they do not yet have. An effective learning method is a form of activity to improve the culture of literacy in the community. The demonstration learning methods and field experiments proposed as learning methods are expected to be in accordance with the characteristics of coffee farmers in Bendosari Village in the context of empowering coffee farmers in Bendosari Village. The purpose of this study is to identify how effective the demonstration learning methods and field experiments for empowering coffee farmers in Bendosari Village, Pujon-Malang Indonesia. The results showed that the demonstration learning method and field experiment very effective in increasing the knowledge and field ability of coffee farmers in Bendosari Village. Increase farmers knowledge and ability by 26.67%.

KEYWORDS
Learning Methods, Demonstration, Experimentation, Coffee Farmers, Bendosari-Indonesia

INTRODUCTION
Literacy culture is an urgent need for anyone in the millennia era as it is today. Literacy comes from the Latin Language "Literatus", which has the meaning of people who study. Literacy is a set of abilities and individual skills in reading, writing, speaking, counting and solving problems at a certain level of expertise needed in daily life (Teale and Sulzby, 1986). In this case, to be able to solve problems in everyday life that are increasingly complex, one needs a high literacy culture. Literacy culture must continue to be promoted among the community in order to be able to improve the quality of life of the community in solving problems around it and be able to be critical and care for their environment. The benefits of growing a high literacy culture in society are adding and increasing knowledge and abilities in various fields and optimizing brain performance. (https://www.maxmanroe.com/vid/umum/arti-literasi-adalah.html).
A learning model is applied as a pattern of interaction between instructors and participants in a learning activity that involves learning strategies, approaches, methods and techniques (Suherman, 2003:7). There are various learning methods based on the problem based learning model that can be chosen as the most effective learning methods for an activity, namely the demonstration method (Sumantri et al., 1998; Sanjaya, 2006), experimental method (Sumantri et al., 1998; Sagala, 2006), demonstration and experimental methods (Sumantri et al., 1998; Sagala, 2006 and Sanjaya, 2006), integrated method (Collins and Dixon, 1991:6), Jigsaw method (Arends, 1997), role playing method (Hadfield, 1986; Zuhaerini, 1983:56 and Syamsu, 2009) dan explicit instruction method (Kardi and Nur, 2000:2). Demonstration learning method is a way of presenting learning by demonstrating and showing a process and situation or certain objects that are being studied, where the objects that are exhibited can be in their actual or imitated form. Experimental learning method is a way of presenting learning that allows participants to do direct experiments to prove what is being learned. While the demonstration and experimental methods are combined learning methods from the demonstration and experimental methods (Sumantri et al., 1998; Sagala, 2006 and Sanjaya, 2006). The use of demonstration learning methods and experiments have been widely applied in various studies of learning methods, including by Wadji and Hizbi (2016). The results showed that the demonstration learning and experimental methods had a better effect than the lecture method.

Village communities must be encouraged to develop a culture of literacy so that their villages become developed, established and self-sufficient in food. Through an effective learning method which is one of the activities to improve literacy culture becomes important for village communities. Coffee farmers from Bendosari Village have an innate ability as a self-taught farmer. Knowledge from coffee farmers about suprime coffee cultivation is not yet possessed, even though the environment of Bendosari Village as one of the villages in the Pujon highlands is very supportive as a suprime coffee growing place. In addition, Bendosari Village has a distinctive taste of coffee, namely pine forest arabica coffee which is not owned by other regional coffee flavors. The distinctive taste of pine forest coffee from Bendosari Village Pujon-Malang Indonesia needs to be introduced in the world and the quality of pine forest coffee from Bendosari Village Pujon-Malang Indonesia needs to be improved in order to become a suprime and widely known pine forest coffee in the world from Indonesia. Bendosari Village is located in the western area of the alternative west transportation route and has a strategic potential with an area of 269.23 Ha. The lifestyle and perspective of the community in Bendosari Village is more focused on animal husbandry and agriculture so that the customs and dynamics of the community still prioritize mutual cooperation (http://desa-bendosari.malangkab.go.id/index.php/first/artikel/114).

Based on the characteristics of pine forest coffee farmers from Bendosari Village, Pujon-Malang Indonesia and various reviews of learning methods that have been presented, this research will identify the effectiveness of demonstration learning methods and experiments in the framework of empowering pine forest coffee farmers from Bendosari Village, Pujon-Malang, Indonesia.

LITERATURE REVIEW
Problem Based Learning Model

Various problem-based learning models continue to be developed where this starts from the problems that occur in the field of health science at McMaster University in Canada in the 1960s and was formalized in 1968. The beginning of the development of problem-based learning methods occurs because students are not able to apply a large amount of basic scientific knowledge to clinical situations (Neufeld and Barrows, 1974). This development was then followed by three other medical schools, namely the University of Limburg in Maastricht (Netherlands), the University of Newcastle (Australia) and the University of New Mexico (USA).

The findings from cognitive psychology state that there is a theoretical basis for improving teaching in general and specifically about Problem Based Learning (PBL). The basic premise in cognitive psychology is learning, where learning is a process of constructing new knowledge based on current knowledge. According to Frederick et al. (1991), it is generally assumed that learning is a constructive process and not an acceptance. Cognitive processes called metacognition affect the use of knowledge, social factors and contextual influence learning. According to Suherman (2003:7), the learning model is a pattern of interaction between students and teachers in the classroom that involves strategies, approaches, methods and learning techniques applied. The concept stated by Suherman (2003:7) explains that the learning model is a form of interaction created between the teacher and students related to learning strategies, approaches, methods and techniques.

Gijselaers (1996) states that problem-based learning is derived from the theory that learning is a process in which learners actively construct knowledge. This concept explains that learning occurs from the actions of students and educators only have a role in facilitating the construction of knowledge activities by learners. Educators must focus on helping students achieve self-directed learning skills.

The purpose of the problem-based learning method according to the Ministry of National Education (2003) is to make students become independent learners. This means that when students learn, students can choose appropriate learning strategies, so they become skilled using these strategies for learning and are able to control their learning processes, and are motivated to complete their learning. Therefore, the main purpose of problem-based learning is to explore the creativity of students in thinking and can motivate students to continue learning. Ibrahim (2000:7) states that problem-based learning is not designed to help teachers provide as much information to students, but problem-based learning is developed to help students develop thinking skills, problem solving and intellectual skills, learning various roles through engaging in real experiences or simulation and become an independent learner. Based on this understanding it can be seen that problem-based learning is focused on student learning development, not to help teachers gather information that will later be given to students during the learning process.

Gijselaers (1996) states that the principles of problem based learning according to the view of cognitive psychology have three principles, namely:

**Learning is a Constructive Process and Not Acceptance**
Traditional learning is dominated by the view that learning is the pouring of knowledge into the head of the learner. The head learner is seen as an empty box that is ready to be filled through repetition and acceptance. Teaching is more directed at storing information by the learner in his memory, as well as storing books in a library. Callback information depends on the quality of the call number used in classifying information. However, modern cognitive psychology states that memory is an associative structure. Knowledge is arranged in networks between concepts, referring to semantic ties. When learning, new information occurs coupled to the existing information network. Semantic links not only concern how to store information, but also how that information is interpreted and invoked.

Knowing About Knowing (Metacognition) Affects Learning
Learning is a fast process. When learners propose self-monitoring skills, they generally refer to metacognition. Metacognition is seen as an essential element of learning skills, such as setting goals (what am I going to do), selection strategies (how am I doing it?) and evaluating goals (did it work?). The success of problem solving does not only depend on the ownership of content knowledge (body of knowledge), but also depends on the use of problem solving methods to achieve goals. Specifically, metacognitive skills include the ability to monitor self-learning behavior, that is, being aware of how a problem is analyzed and whether the results of problem solving make sense?

Contextual and Social Factors Influence Learning
The use of knowledge directs the learner to have knowledge and to be able to apply the problem solving process, which is a very ambitious goal. Learning usually begins with the conveying of knowledge by the instructor to the learner, then followed by assigning tasks in the form of problems to increase the use of knowledge. However various studies show that learners experience serious difficulties in using scientific knowledge.

According to Arends (1997), in its implementation, several advantages possessed by problem-based learning are: (1) Developing critical thinking, creative and independent skills, (2) Increasing motivation and problem solving skills, (3) Helping students learn to transfer knowledge with new situations, (4) Learning becomes meaningful, (5) Students are able to integrate knowledge and skills simultaneously and apply them in relevant contexts and (6) Improve critical thinking skills, foster learning initiatives at work, internal motivation for learning and can develop interpersonal relationships in group work. But some of the drawbacks of problem-based learning in field use are: (1) students and instructors are not familiar with this method, (2) Lack of learning time, (3) Students cannot really know what might be important for them to learning and (4) A teacher is difficult to be a good facilitator.

Demonstration Learning Methods
The demonstration method is one of the learning methods by using a demonstration to clarify an understanding or to show how a particular formation process is going on for the learner. The showing in the demonstration method, instructors can use the original object or imitation objects on the learner. The use of demonstration methods is generally to provide a clearer picture of the process of organizing and making something, the process of working something and the process of working on it or using it. The basic assumption of using the demonstration learning method is that working and seeing directly will be better than just hearing from a work process, moreover
there are several types of learners that can be found, namely visual, auditive, motor and mixed types (Nata, 2009; Listianti, 2014). By applying the demonstration method in learning makes students clearer, more interesting, more memorable, easy to remember and understand, so as to encourage the creativity of the learner (Nasution, 2004). The demonstration method is a very effective learning method because it is able to attract learners’ attention to their instructors and generally the demonstration method is used by instructors as an appropriate alternative to playing the role for learners (Listianti, 2014).

Important aspects in using the demonstration learning method are: (1) Demonstration will be an immoderate method if the demonstration tool cannot be observed carefully by students, for example the tool is too small or the explanation is unclear. (2) Demonstrations become less effective if they are not followed by activities where the learners themselves can pay attention and become their activities as valuable experiences. (3) Not everything can be demonstrated in class because there may be some tools that are too big or are in other places far from the class. (4) Should be done in practical matters (5) As a preliminary, give understanding and theoretical basis of what will be demonstrated. It is an important note that in demonstrating the lesson, the instructor must first demonstrate as well as possible, then the learner follows the instructor's instructions (Hakim, 2006).

According to Sanjaya (2006), the advantages possessed by the demonstration method are (1) The attention of the learner can be focused on the emphasis that is considered important by the instructor and can be directly observed, (2) The attention of the learner will be more focused on what is being demonstrated, so the process of understanding the learner will be more directed and will reduce the learner's attention to other problems, (3) Can stimulate learners to be more active in following the learning process, (4) Can increase the experience for learners, (5) Can help learners remember more about the material delivered, (6) Can increase the experience for learners, (7) Can answer all problems that arise in the minds of every learner because they participate directly. While the deficiencies possessed by the demonstration method are (1) Requires considerable time, (2) If there is a shortage of media, the demonstration method becomes less efficient, (3) Requires quite expensive costs, especially to buy materials for demonstration, (4) Requires a lot of energy and (5) If students are not active then the method of demonstrators becomes ineffective.

Sanjaya (2006) states about the steps in applying the demonstration method are (1) Planning, in planning things that must be done include a. Formulate good objectives from the standpoint of skills or activities that are expected to be achieved after the demonstration method ends, b. Determine the outline of the demonstration steps to be carried out c. Calculate the time required d. During the demonstration the instructor must introspect whether the information conveyed can be heard clearly by the learner? Are all media used in a good position so that all learners can see everything clearly? Learners are advised to take notes as deemed necessary and set a plan of assessment of the learner's abilities. (2) Implementation, in this case matters that need attention are a. Check all the readiness for implementation, b. Demonstrating by drawing the attention of students, c. Remembering the main points of the material to be demonstrated in order to achieve the goal d. Paying attention to the situation of the learners, whether all of them participated in the demonstration properly, e. Provide opportunities for learners to be active and f. Avoid tension.
Experimental Learning Methods
Experimental Method is a method of learning between instructors and learners together in doing an exercise or an experiment to determine the effect of an action (Sagala, 2006:7-17). Experiments are experimental activities to prove a particular question or hypothesis. Experiments can be done in a laboratory or outside the laboratory, where the experimental work contains the meaning of learning to do, so it can be included in the learning method (Sagala, 2006:7-17 in Nugroho, 2012). According to Djamarah and Zain (2006), the experimental method is a way of presenting lessons in which learners conduct experiments by experiencing and proving themselves something that is learned. Sumantri et al. (2001) says that the experimental method is defined as a way of teaching and learning that involves learners by experiencing and proving the process and results of experiments. According to Roestiyah (2001:80), the experimental method is a way of teaching where the learner conducts an experiment about something, observes the process and writes the results of the experiment, then the results are conveyed to the class and evaluated by the instructor.

The target of the experimental method is 1) Learners can prove the real truth of applicable legal theories, 2) It is expected that with this method learners can get satisfaction from the results of their learning. So it can be stated that the purpose of the experimental learning method is (1) Learners are able to deduce facts, information or data obtained, (2) Learners are able to design, prepare, carry out and report experiments, (3) Learners are able to use inductive thinking logic to draw conclusions from facts, information or data collected through experiments and (4) Learners are able to think systematically, highly disciplined, orderly and neat life (Abimanyu, 2009:7-17). There are several steps in implementing the experimental method, namely: explaining the experimental method, discussing the significant issues to be raised first, before the instructor determines the tools needed and what steps must be controlled on the variables that must be observed and after the experiment is carried out, instructors must collect reports, process activities, and conduct tests to test the understanding of learners (Sumiati and Astra, 2008:102).

The advantages of the experimental method are (1) Increase the activeness of learners in doing and solving their own problems and (2) Can implement scientific methods properly. The weakness of the experimental method are (1) Not all subjects can use the experimental method and (2) Students who have less intellectual power will result in poor results. The experimental method should be applied to lessons that have not been taught or explained by other methods, so that the experimental method feels its function right for the learner. Some important things that need to be considered in conducting the experimental method are (1) Prepare the required materials first, (2) Keep the learner directly involved when conducting the experiment, (3) Before conducting the experiment, the learner is first given an explanation and instructions guidance as needed, (4) Conduct grouping or each individual conducts a planned experiment, if the results are not satisfactory then it can be repeated again to prove its truth and (5) Each group or individual can report the results of the experiment in writing (Sagala, 2006).

Demonstration and Experiment Learning Methods
The demonstration and experiment method is a combined learning method between the demonstration method and the experimental method as explained in section B and section C. This means that all the properties, advantages and disadvantages of the demonstration method and the experimental method will be integrated in the demonstration and experimental methods.
Suggestions for implementation demonstration and experimental methods are (1) Conduct demonstration and experimental methods in matters that are practical and urgent in the community, (2) Direct demonstrations and experiments so that learners get a clear understanding in shaping practical attitudes and skills, (3) Try to get all learners to take part in demonstrations and experiments and (4) Give a clear understanding of the theoretical basis of what you want to demonstrate and experiment with (Sagala, 2006; Sanjaya, 2006).

RESEARCH METHODS

The data used in this study are the results of evaluation of community service activities of Doctorate Servants on the empowerment of pine forest coffee farmers in Bendosari Village, Pujon District, Malang Regency Indonesia in 2018 as shown in Figure 1. The learners in this research activity were coffee farmers from Bendosari Village and the instructors in this activity were expert lecturers in the field of coffee from Brawijaya University and experienced coffee farmers from Tumpang Village, Malang Regency. The learning model is done by the method of demonstration and experimentation from instructors to learners. The demonstration method was carried out at the Bendosari Village Hall and the experimental method was carried out on the coffee plantations owned by one of the coffee farmers in Bendosari Village. Evaluation of activities to identify the effectiveness of the use of learning methods is done by looking at the level of learner attendance, the level of activeness and interest of learners and evaluation of pre-test and post-test. The number of coffee farmers who participated in the research was 27 people. Data analysis was performed using regression modeling and correlation and the comparative test of two populations paired with t with the risk of modeling and testing errors of $\alpha = 5\%$. Data analysis was performed with the Minitab Program.
Figure 1. Community Service Activities: Doctoral Services in Bendosari Village, Pujon, Indonesia
RESEARCH RESULT AND DISCUSSION

The results of evaluating the effectiveness for the application of demonstration and experimental methods in the Dedication of Doctoral Services training activities as a form of community service activities in Bendosari Village, Pujon Malang Indonesia, gave the following results:

Research Results Data and Descriptive Statistics

Research Results Data

The results of the evaluation for the activities of the Bendosari Village coffee farmers are shown in Table 1. The attendance rate of activity participants is measured in percentage of attendance, if a coffee farmer is present 8 hours during the activity, then the attendance rate is measured 100%. Post-test and pre-test values are measured based on the percentage of correct answers obtained from coffee farmers.

<table>
<thead>
<tr>
<th>Coffee Farmers</th>
<th>Coffee Farmers Attendance Level (%)</th>
<th>Post-Test Values (%)</th>
<th>Pre-Test Values (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>89</td>
<td>54</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>84</td>
<td>63</td>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>73</td>
<td>66</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>89</td>
<td>73</td>
</tr>
<tr>
<td>5</td>
<td>87.5</td>
<td>79</td>
<td>43</td>
</tr>
<tr>
<td>6</td>
<td>87.5</td>
<td>80</td>
<td>49</td>
</tr>
<tr>
<td>7</td>
<td>100</td>
<td>82</td>
<td>59</td>
</tr>
<tr>
<td>8</td>
<td>100</td>
<td>88</td>
<td>63</td>
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<tr>
<td>9</td>
<td>100</td>
<td>89</td>
<td>70</td>
</tr>
<tr>
<td>10</td>
<td>100</td>
<td>89</td>
<td>74</td>
</tr>
<tr>
<td>11</td>
<td>87.5</td>
<td>81</td>
<td>40</td>
</tr>
<tr>
<td>12</td>
<td>87.5</td>
<td>80</td>
<td>45</td>
</tr>
<tr>
<td>13</td>
<td>100</td>
<td>83</td>
<td>61</td>
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<tr>
<td>14</td>
<td>100</td>
<td>82</td>
<td>64</td>
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<tr>
<td>15</td>
<td>100</td>
<td>86</td>
<td>61</td>
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<tr>
<td>16</td>
<td>87.5</td>
<td>82</td>
<td>58</td>
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<tr>
<td>17</td>
<td>100</td>
<td>84</td>
<td>64</td>
</tr>
<tr>
<td>18</td>
<td>75</td>
<td>72</td>
<td>45</td>
</tr>
<tr>
<td>19</td>
<td>100</td>
<td>90</td>
<td>42</td>
</tr>
<tr>
<td>20</td>
<td>100</td>
<td>89</td>
<td>70</td>
</tr>
<tr>
<td>21</td>
<td>100</td>
<td>92</td>
<td>48</td>
</tr>
<tr>
<td>22</td>
<td>100</td>
<td>98</td>
<td>64</td>
</tr>
<tr>
<td>23</td>
<td>100</td>
<td>86</td>
<td>54</td>
</tr>
</tbody>
</table>
Descriptive statistics from the research data as shown in Table 2. The results of the average post-test values indicated greater than the pre-test average value (85.00%>58.33%) with a standard deviation of the post-test value of 5.60 and the standard deviation of the pre-test value of 10.56. The lowest percentage of post-test scores by 72% and the highest percentage of post-test scores by 98%. The lowest percentage of pre-test scores by 40% and the highest percentage of pre-test scores by 74%. The percentage of the majority of the post-test scores obtained was 89% and the percentage of the majority of the pre-test scores obtained was 63% and 64%. The average level of attendance of coffee farmers in this activity was 95.83% with a standard deviation of 7.75. The lowest attendance rate is 75% and the highest attendance rate is 100%. The majority of coffee farmer attendance rates are 100%. Plots of coffee farmer attendance rates and post-test scores are shown in Figure 2. The scatterplot results indicate that there is an indication of a positive relationship between the level of coffee farmer attendance with the post-test value.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SE Mean</th>
<th>StDev</th>
<th>Variance</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Range</th>
<th>Mode</th>
<th>N for Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers Attendance Level (%)</td>
<td>95.83</td>
<td>1.49</td>
<td>7.75</td>
<td>60.10</td>
<td>75</td>
<td>100</td>
<td>25</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Post-Test Values (%)</td>
<td>85.00</td>
<td>1.08</td>
<td>5.60</td>
<td>31.38</td>
<td>72</td>
<td>98</td>
<td>26</td>
<td>89</td>
<td>7</td>
</tr>
<tr>
<td>Pre-Test Values (%)</td>
<td>58.33</td>
<td>2.03</td>
<td>10.56</td>
<td>111.62</td>
<td>40</td>
<td>74</td>
<td>34</td>
<td>63;64</td>
<td>3</td>
</tr>
</tbody>
</table>
Data Distribution Identification

Identification of the distribution of data is very important to do associated with the selection of the right analytical method. The results of the distribution identification for the post-test value and the pre-test value data are shown in Figure 3 and Figure 4. Based on Figure 3, it can be shown that the post-test value data has a normal distribution because of P-value (>0.150) > $\alpha = 5\%$ and based on Figure 4, it can be shown that the pre-test value data also has a normal distribution because of the P-value (0.093) > $\alpha = 5\%$.
Regression Model and Correlation

Correlation analysis and regression models were performed to determine the magnitude of the relationship and the form of the relationship between the level of coffee farmers attendance and the post-test scores obtained. Correlation analysis and regression models will provide information
about the effectiveness of demonstration and experiments learning methods in terms of the interests of coffee farmers in participating in the activities carried out. The results of the correlation analysis are shown as follows:

Matrix CORR1

<table>
<thead>
<tr>
<th></th>
<th>1.00000</th>
<th>0.80812</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.80812</td>
<td>1.00000</td>
<td></td>
</tr>
</tbody>
</table>

**Correlations: Farmers Attendance Level (%); Post-Test Values (%)**

Pearson correlation of Farmers Attendance Level(%) and Post-Test Values(%) = 0.808

P-Value = 0.000

Correlation value between coffee farmers attendance level and post-test value of 0.808 with the results of the correlation test has a P-value of 0.000 < \( \alpha = 5\% \). This means that between coffee farmers attendance level and post-test value has a very real linear relationship with a correlation value of 0.808. The correlation value is positive, meaning that an increase in the presence of coffee farmers in the activity, the higher the post-test value obtained by coffee farmers and on the contrary. This conclusion has a 95% truth level and an error rate of 5%.

While the results of the analysis of the regression model are shown as follows:

**Regression Analysis: Post-Test Values versus Farmers Attendance Level (%)**

The regression equation is

\[
\text{Post-Test Values} = 29.0 + 0.584 \times \text{Farmers Attendance Level}
\]

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Coef</th>
<th>SE Coef</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>29.033</td>
<td>8.184</td>
<td>3.55</td>
<td>0.002</td>
</tr>
<tr>
<td>Farmers Attendance Level(%)</td>
<td>0.58400</td>
<td>0.08513</td>
<td>6.86</td>
<td>0.000</td>
</tr>
</tbody>
</table>

\( S = 3.36512 \) \( \text{R-Sq} = 65.3\% \) \( \text{R-Sq(adj)} = 63.9\% \)

**Analysis of Variance**

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>1</td>
<td>532.90</td>
<td>532.90</td>
<td>47.06</td>
<td>0.000</td>
</tr>
<tr>
<td>Residual Error</td>
<td>25</td>
<td>283.10</td>
<td>11.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>816.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The form of the model for the relationship between coffee farmers attendance and post-test scores is as follows:

\[
\text{Post-Test Values} = 29.0 + 0.584 \times \text{Farmers Attendance Level}
\]

This linear regression equation model has R-Sq = 65.3% with the results of the test parameters of the regression model having a very significant effect. That is, there is a very real linear relationship between the level of attendance of coffee farmers and the post-test value obtained...
by coffee farmers, where the goodness of fit model is 65.3% and the standard deviation is 3.36512. This conclusion has a 95% truth level and an error rate of 5%.

**Student’s t Test of Two Paired Populations**

Student t-test of two paired populations to the results of pre-test and post-test scores were carried out to determine the effectiveness of demonstration and experiments learning methods in terms of the ability and expertise of coffee farmers in understanding the material being demoted and experimented by the instructor on coffee farmers. If the results of the post-test scores differ from the results of the pre-test scores, where the post-test scores are higher than the pre-test scores, then it can be stated that the method of demonstration and experimentation learning is very effectively applied to this activity. Conversely, if the post-test value is lower than the pre-test value, then it can be stated that the demonstration and experimental learning methods are not very effective in this activity. The t-Student test results of two paired populations are as follows:

**Paired t-Test and CI: Post-Test Values (%) ; Pre-Test Values (%)**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>StDev</th>
<th>SE Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Test Values</td>
<td>27</td>
<td>85.00</td>
<td>5.60</td>
<td>1.08</td>
</tr>
<tr>
<td>Pre-Test Values</td>
<td>27</td>
<td>58.33</td>
<td>10.56</td>
<td>2.03</td>
</tr>
<tr>
<td>Difference</td>
<td>27</td>
<td>26.67</td>
<td>10.01</td>
<td>1.93</td>
</tr>
</tbody>
</table>

95% lower bound for mean difference: 23.38

t-Test of mean difference = 0 (vs > 0): t-Value = 13.84  P-Value = 0.000

Student t test results show that there are very significant differences between the post-test and pre-test scores, where the post-test scores are higher than the pre-test scores. This is shown from the results of the one-way test with a P-value = 0.000 < α = 5%. The average post-test score of 85% correct answers and the average pre-test score of 58.33% correct answers. The demonstration learning method and field experiment very effective in increasing the knowledge and field ability of coffee farmers in Bendosari Village. Increase coffee farmers knowledge and ability by 26.67%. This conclusion has a 95% truth level and an error rate of 5%.

In terms of the activity of coffee farmers in activities it can be stated that the activity of asking questions and the attention of coffee farmers to instructors is very high. This is indicated by the number of questions raised by farmers to instructors so that the discussion goes well. The attention of coffee farmers is also high and this can be seen from the absence of coffee farmers who play mobile phones or chat among farmers. Thus, the demonstration and experiment method is very effective to be applied in the activities of Doctor of Serving in the framework of community service in Bendosari Village, Pujon-Malang Indonesia.

**CONCLUSION**

The application of demonstration and experimental learning methods in the activities of Doctor of Serving in the context of community service is very effective in increasing the ability and
understanding of material by coffee farmers and can increase the interest of coffee farmers in participating in a whole series of learning activities. There is a very real linear relationship between the level of attendance of coffee farmers with the post-test scores obtained, where the higher the level of attendance of coffee farmers in activities, the higher the post-test scores obtained and on the contrary. The relationship model is Post-Test Values (%) = 29.0 + 0.584 Farmers Attendance Level (%) with a value of R-Sq = 65.3% and a standard deviation value of 3.36512. The t-Student test results stated that the results of the post-test scores of coffee farmers were much higher compared to the results of the pre-test scores of coffee farmers. The increase coffee farmers knowledge and ability by 26.67%. In addition, demonstration and experimental learning methods can increase the concentration, attention and activeness of coffee farmers in the activities carried out.

REFERENCES


