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### Application of Service-Learning for Developing Curiosity, Responsibility, and Honesty of Biology Education's Students, Sanata Dharma University

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**Abstract.** This study aims to describe the application of Service-Learning in developing the values of curiosity, responsibility, and honesty of the students of the Biology Education Study Program, Sanata Dharma University. This research used a mixed method of qualitative and quantitative. The research subjects were 76 students of Natural Resources Management (NRM) course, Academic Year of 2016/2017. The data was collected using questionnaires and documented in the form of activity report of Service-Learning. The results showed that Service-Learning can develop the students' curiosity, responsibility, and honesty. Character development can occur because students are invited directly involved in identifying the problems that occur in the community and implement programs of community service activities. Through Service-Learning, students can apply the theory of learning into the real world problem in the society. It can indirectly develop students' responsibilities as citizens.

#### 1. Introduction

Character education is a movement proclaimed by the government of Indonesia in order to overcome the declining character of the young generation of today. Curiosity, responsibility, and honesty are three of the eighteen values promoted by the Indonesian Government to be implemented at all levels of education including Higher Education. For a biology education student, these three characters are important to possess as part of a scientific attitude. Curiosity is one's attitude and eagerness to know more deeply and extensively from what one learns, sees, and hears. Responsibility refers to one's accountable attitude and behavior in carrying out his duties and obligations, to himself and others and the environment, while honesty is one's behavior to make oneself trustworthy in words, actions and work [1]. From the definition, it can be seen that the values of good characters do not only cover concepts and understanding but also cover aspects of attitude and action. It is expected that when students have these values, they can take real action and it will become the character of a nation. Character refers not only to the notion of knowing something (to know), but also doing something (to do), living together with others (to live together), and being a better human person (to be). Thus students get accustomed to doing good according to their values, perfectly make their life much better [2].

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*by Handoyo Luisa Diana*

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## 1. Introduction

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In its application, character education must be holistic. All parties involved in the educational process are crucial to the success of the character education. This means that it is not only the schools that have the responsibility to educate and shape students' character but the parents and the whole community are also responsible. Schools or colleges also have a significant role in developing students' character. Thus, character education in schools is not solely the task of teachers but also the task of all community members in the school. Teachers as role models for students have a big enough role, especially in fostering their students' critical thinking habits. In this case, character education can be instilled through various activities and learning methods. One of the learning methods that can be applied to support character education movement is Service-Learning.

According to the National Service-Learning Clearinghouse (NSLC), service learning is a learning and learning strategy that integrates community service activities in the learning process and involves reflection to enrich learning experiences, teaching responsibilities as citizens and strengthen society. Meanwhile, according to KIDS Consortium, service-learning is a method of teaching and learning that challenges students to identify, conduct research, write proposals and implement solution to community needs as part of the curriculum [3]. Some studies mention the positive impact of the application of service-learning for students. The application of service-learning in learning is prioritized for students' cognitive development and academic achievement because their activities are related to disciplining students [4] [5]. Service-learning has a positive effect on student learning outcomes. In addition to the cognitive benefits, several studies have expressed the benefits of service-learning as in higher-order thinking, empathy, cultural awareness [6], personal and interpersonal development, motivation to engage in social issues, motivation, life skills [7]. Service-learning can improve students' creativity, responsibility, hard work, communication skills, and social care [8]. Seeing the many benefits of service-learning for the development of students, the development of service-learning in learning continues to be developed, especially to develop students' character.

## 2. Methodology

This research is a mixture of quantitative and qualitative research. Quantitative research was conducted to measure the development of good character traits, such as curiosity, responsibilities, and honesty using the character questionnaire instrument. Quantitative data analysis was done by comparing the initial character traits before the implementation of service-learning and the final character traits after the implementation of service-learning. Qualitative data were obtained from the student reflection on the report of the service-learning activities. Qualitative data are analyzed qualitatively by describing the development of good character traits, i.e. curiosity, responsibility, and honesty. The subjects of this research were 76 students of Natural Resources Management (NRM) course, Biology Education Study Program, Sanata Dharma University, the second-semester of the Academic Year 2016/2017.

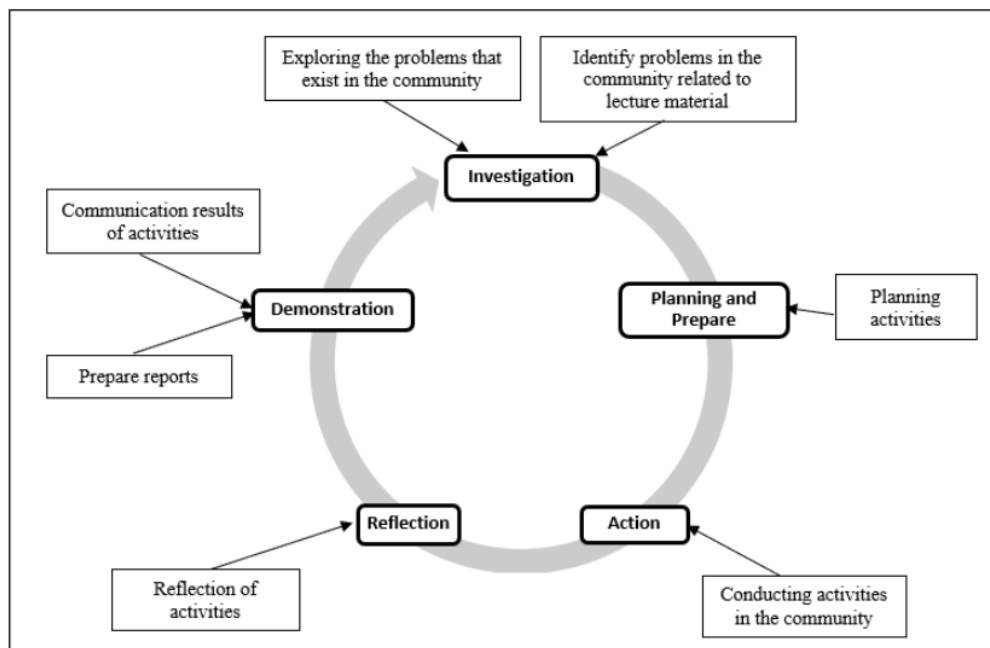
## 3. Result and Discussion

### 3.1. Application of Service-Learning in Natural Resource Management (NRM) Course

Service-learning in NRM course was applied in the even semester (2<sup>nd</sup>) of the academic year 2016/2017. The subject matter used was on Participatory Rural Appraisal (PRA) materials. In the implementation, 76 students were divided into 16 groups. The service-learning stage is a modification of the stages proposed by [9], namely Investigation, Planning and Preparation, Action, Reflection, and Demonstration. In this study, the stages of service-learning can be seen in figure 1 below.

The investigation stage was conducted by observation and interview to the owners of cattle and goats in Turgo, Purwobinangun, Sleman, Yogyakarta, on May 20, 2017. Observations and interviews were directed to explore potentials and obstacles on livestock management aspects. Through this investigation activity, students learned to know that Turgo people mostly have cattle and goats. Currently, milk livestock is sold in raw form to dairy cooperatives. The selling price of raw cow's milk is relatively cheap because it has not undergone processing. Milk has been processed into ginger milk and milk powder, but now milk processing is not done by the farmers anymore. Processing milk into

ginger milk is constrained by insufficient production and milk powder processing is constrained by the lack of public interest to buy it. From this investigation activity, students learn to know the potential of cow milk that has not been processed by the Turgo community. This potential becomes the study material for further planning and preparation activities.



**Figure 1.** Service-Learning activity step.

<sup>1</sup> The planning and preparation stage is held in class in regular face-to-face meetings. At this stage, student groups present their observations and interviews. Students create a list of potential and obstacles experienced by the people of Turgo in managing cattle and goats. After students learn about the potential and obstacles faced by the community, they discuss community service activities that can be done, especially related to Participatory Rural Appraisal (PRA) material. Planning involves determining the schedule of activities, the agenda of PRA activities to be undertaken, and technical issues such as transportation and consumption during activities.

The action phase was held on May 27, 2017, taking place at the house of Mr. Musimin, in Dusun Turgo. In this activity, students practice PRA to the community. PRA is a technique that enables communities to participate in planning, monitoring and evaluating policies that affect their lives. PRA principle asserts that society is regarded as the subject, not just the object of a policy. In addition, outsiders involved to serve as facilitators and communities as actors [10]. The action phase was attended by citizens of Turgo community. At this stage, students had the opportunity to present their observations. After the presentation, the students acted as facilitators who invited the community to discuss together how to develop the dairy products produced in Turgo. Students offered training activities for making ice cream and yogurt as alternative dairy products. Citizens welcomed the proposal. Together, citizens and students discussed the technical training activities to be undertaken. The reflection and demonstration stage were done in the form of activity report. Reflection was guided by 5 (five) questions, namely 1) how do you feel when you are involved in service-learning ?, 2) what do you feel when doing observation and PRA in community citizen?, 3) how do you feel about the



problem faced by citizen society?, 4) What ideas came to your mind related to <sup>1</sup>the problems that exist in the community based on the learning in the classroom and the discussion?, and 5) What intentions <sup>14</sup>emerge from your personality after learning, gaining experience and information from the citizens as a result of doing the service-learning activities? <sup>11</sup>

From students' reflection, it was known that at the beginning of the service-learning task, students felt confused in general because they had never done service-learning before. However, they also felt curious and happy to have the opportunity to study outside the classroom and with the community. From the observation activities, it was known that students felt enthusiastic when they had to go directly to the field and meet with the citizens. In addition, students could also develop creative ideas to socialize with the citizens. Observation activities also left a deep impression in the students, especially about the problems faced by citizens. Students felt concerned as shown in the quote below. The student in the quote below shows the attitude of empathy to the problems in the community. This impression is a good start in fostering a caring character for others.

<sup>2</sup>"The impression I got from observing the problems in the community is that I am quite concerned. In my opinion, dairy cattle breeding in Turgo village is highly prospective and the people need to be educated that cow's milk can not only be processed conventionally but it can be processed into more modern beverage and food products. If cow's milk is processed into more varied products, the benefits can increase people's economic income"(ANP)

<sup>2</sup>"My impression on the problems that exist in the community is that I feel surprised to know that the sale price of pure cow's milk is not worth the cost of cattle breeding. This is due to the lack of knowledge and human resources (labor) in processing cow's milk"(MNGR)

The service-learning activity inspires students to have some ideas and intentions in dealing with the problems in society as seen in the quotation below.

"I'm inspired to add some flavors from agricultural plants produced by the farmers in Turgo Village in the yogurt and ice cream. . Another potential is cow dung. Other than being sold, cow dung can be used as biogas and organic fertilizers so that they do not only get milk from the cow, but also fertilizers, biogas, etc. . I'm greatly inspired to get more involved in the field to make changes for the wider community with all the ideas I have to implement sustainable management"(DRT)

"I want to find a way of processing milk in other forms. I have an idea to conduct training on goat milk processing to be a beauty mask. There are a lot of people raising goat for milk in this area. Plus the fact that goat milk has many nutrients for the skin. Processed from goat milk products will make the economic value even higher" (ERRS)

The quote shows that the Service-Learning that students do in the <sup>20</sup>course of NRM gives an impact on their personal development. Service-Learning can help prepare students to be sensitive citizens to the problems that occur in the environment around them. The hope is that the service-learning experience in this NRM course can be developed again in their own place.

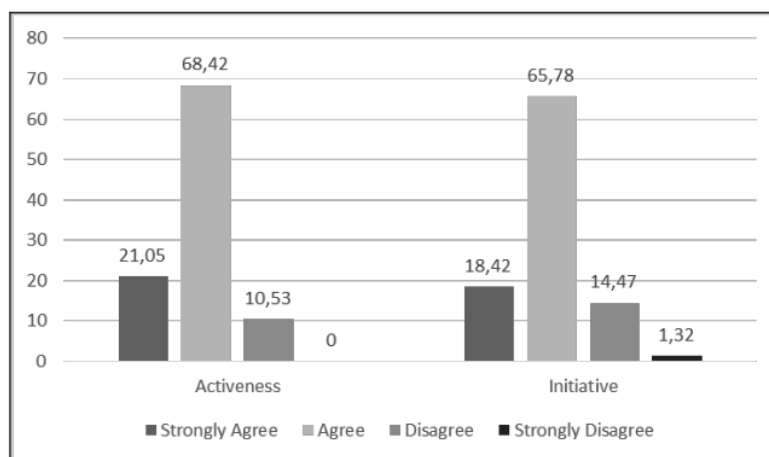
### 3.2. The Development of Curiosity Character

The development of the curiosity character was analyzed through the initial and final questionnaires. The indicator of the curiosity character in this research is to search for information from various sources, with the question "Where do you usually find information related to NRM lectures?" From the initial questionnaire, it is known that in general students look for information from lecturers, internet, books, field observations, interviews with resource persons, journals, discussions, popular news, print media, as well as from personal experience. The Internet and books are the most widely

used sources of information for students. Preliminary questionnaire data is shown in table 1 below. Internet and books ranked 1st and 2nd mostly used sources by students respectively. Observations and interviews were not commonly done by students. The development of students' character of curiosity in this study is directed so that the students can better observe and interview the sources as sources of information. The final character of curiosity is revealed through two indicators of seeking information from various sources and having the initiative to seek information. The results of the final questionnaire are shown in figure 2 below.

**Table 1.** Percentage of information sources for students.

Sources of Information	Percentage (%)
Lecturer	6,40
Internet	27,09
Book	24,63
Field observation and interview of resource persons	13,79
Journal	13,79
Discussion	10,34
Other (news, print media, personal experience)	3,94



**Figure 2.** Activity and student initiative in finding information.

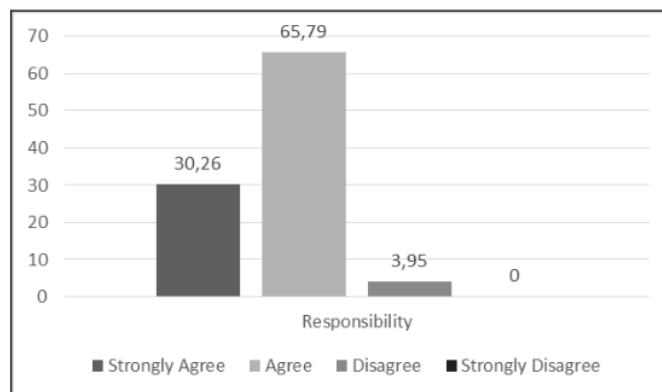
Figure 2 above shows that after implementing service-learning, 89.47% of students stated that they strongly agreed and agreed actively in finding information from various sources and 84.2% of students stated that they strongly agreed and agreed to have initiative<sup>10</sup> to seek information from various sources, not from lecturers only. The character of curiosity is a way of thinking, attitude, and behavior that reflects the curiosity and curiosity of<sup>16</sup> things seen, heard and studied in more depth [11]. In line with that definition, Lisytarini [1] states that curiosity is an attitude and action for always seeking to know more deeply and extensively from something one learns, sees, and hears. Students' curiosity development in NRM course was done through observation and interview in the service-learning investigation phase. At this stage, students were asked to make a direct observation to the public related to the potential and problems faced by the community. Students should explore information from the public on the topic of cattle or goat management by citizens of Turgo. Through these

activities, students can develop their curiosity, especially about the problems in society. Students have real experience in finding information from primary sources i.e. the community, instead of from secondary sources such as websites, news or books. In addition to developing the character of curiosity, observation activities also provide an opportunity for students to interact with the community directly.

Curiosity is the beginning of knowledge. Knowledge begins with curiosity [12]. When someone is curious about something, he will find a way to get the information he wants. This curious character is very important for students who are studying. In the process of learning, the character of curiosity is necessary to make students become active thinkers and observers to generate motivation from within students to continue learning [13] [14]. Service-learning can develop students' curiosity as students are exposed to the context of society. Students should be able to dig up information and find out all the potentials and problems in the community. Students should be able to interact with the community well in order to obtain information. Through this process, students are expected to be sensitive and ready to be citizens who can help solve the problems that occur in the community with the provision of the theory that has been learned in the classroom.

### 3.3. The Development of The Character of Responsibility

The character of responsibility in this study was analyzed through the initial and final questionnaires. From the preliminary questionnaire it was found that 51.56% of college students felt they had a great responsibility, 43.75% moderate, and 4.69% felt that they were less responsible. The development of the character of responsibility after the implementation of service-learning was assessed from the final questionnaire with the indicator of "completing the task well." The results can be seen in figure 3 below. From the data, it can be seen that after doing service-learning, 96.05% of students strongly agreed and agreed that they were responsible for completing the task given to them.



**Figure 3.** Student responsibility in completing the task.

According to Barbara [13] responsibility is being reliable, determined, organized, timely, to honor commitment and planning. There are several types of responsibilities, including moral responsibility; legal liability; family responsibility; community responsibility; responsibility for customs, traditions, beliefs and rules; as well as personal responsibility. Meanwhile, according to Listyarti [1], the character of responsibility is the attitude and behavior of a person to perform his duties and obligations, to himself and others and the surrounding environment. As social beings, there are three kinds of responsibilities, namely personal responsibility, social responsibility, and total responsibility to God Almighty. Personal responsibility plays a role in making oneself good individuals while social responsibility is related to others, thus providing benefits among others [16].



The character of responsibility in this study was developed through the provision of service-learning tasks. Students are challenged to apply learning theories obtained in the classroom to overcome the real problems in the society. The character of responsibility in this research is focused on the development of personal and social responsibilities. Personally, the sense of responsibility of the students is seen from how much responsibility they have in completing the service-learning task. Service-learning is a learning method that requires great responsibility from students because they must be able to make good planning for all stages of service-learning to be done properly. The service-learning process requires considerable time and effort, so the student must be able to perform time management and task management well. In addition, the timeliness in carrying out activities in the community should also be considered. From the observations made, it appears that students try to run all stages of service-learning well and in accordance with the time specified. Students are able to complete the task of service-learning in a timely manner in accordance with the planning undertaken.

This is in line with Issac's opinion [17], which states that "The responsible person will fulfill all obligations by mobilizing the best of his abilities." In this study, it appears that the student is able to complete the service-learning task even though they have other tasks in other courses. Students can regulate themselves, plan, persevere, and be timely so that service-learning can be completed properly.

In addition to personal responsibility, the implementation of service-learning can also develop social responsibility because students learn to solve existing problems in society. This appears in the following quotation.

"... (I want) to be a more sensitive person to the problems in my own society, so that I can provide the right solution to overcome them" (RH)

Learning theory obtained by students in the classroom is an object in conducting service-learning activities. Through the service-learning students learn to apply the theory to a real action that is useful for the community. Classroom theory is not only theory but can be realized in action which can help solve the problems that exist in society. Students learn to be a responsible person not only for themselves but also can take a role in society. This indirectly equips students to become individuals who are ready to go to the community when they have completed their studies.

### 3.4. The Development of the Character of Honesty

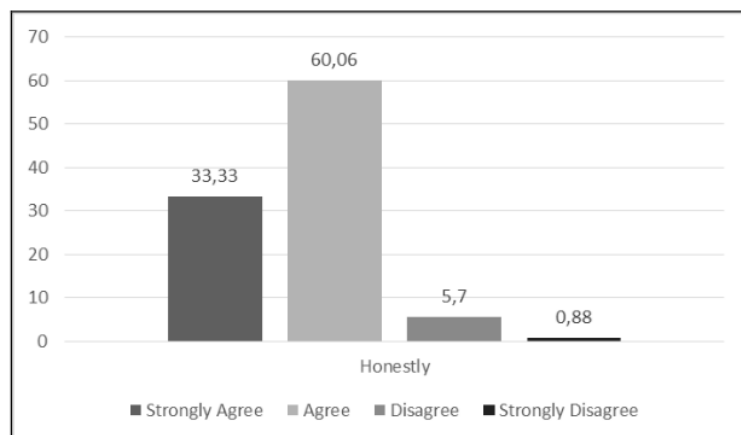
Being honest, according to Listyarti [1], is a behavior based on an attempt to make himself/herself a person who can always be trusted in words, actions, and work. In Oxford Dictionary, the word "honest" is defined as Free of deceit; truthful and sincere; Morally correct or virtuous; Fairly earned, especially through hard work; one with good intentions even unsuccessful or misguided; Simple, unpretentious, and unsophisticated, while "honesty" means the quality of being honest [18]. The honest character is needed in everyday life, including in the learning process. From the initial questionnaire, it is known that honesty is required by students when performing tasks, making reports, taking exams, giving responses and judgments, writing reflections and spelling questions. Percentages can be seen in table 2 below.

**Table 2.** Percentage of honest required during classroom learning.

Activity	Percentage (%)
Doing task	35,29
Working on a problem	10,98
Giving feedback and assessment	2,94
Taking Exam	25,49
Writing a report	30,39
Writing reflection	1,96

From table 2, it can be seen that doing the tasks and reporting requires an honest attitude the most from the students. The application of service-learning to develop honest character is emphasized so

that students can report observation data in accordance with the conditions of the people interviewed and so that students can prepare activity reports in accordance with what is done. The results of the final questionnaire after the implementation of service-learning can be seen in figure 4 below.



**Figure 4.** Percentage of student honesty after service-learning implementation.

From figure 4, it can be seen that 93.39% of students strongly agreed and agreed that they reported the service-learning activities in accordance with the reality in the community. Honesty must be continuously cultivated within the students. In implementing service-learning, honest attitude can start from small things such as reporting the results of interviews and observations in accordance with the reality in the community. Honest attitude can also be nurtured through the process of report writing activities where students are invited to honestly write down all the service-learning process in accordance with what they actually do.

The honest character must be continuously developed within the students. Honesty is the key to happiness and peace as revealed by Burdah [19], who states that in the community, honesty brings peace, inner calm, and even happiness to a person. According to Wijaya [20], honesty is the basic capital for a person in building relationships with others and is the key to success. Service-learning is expected to cultivate students' character to become trustworthy individuals in the community.

#### 4. Conclusion 11

The results showed that service-learning can develop students' curiosity, responsibility, and honesty. Character development can occur because students are directly involved in identifying problems that occur in the community and implementing community service programs. Through service-learning, students can apply the theory of learning into the real world to solve the problem in society. It can indirectly develop students' responsibilities as citizens.

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