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## COLLABORATION OF THE ETHNOBOTANY MATERIALS WITH THE ENVIRONMENTAL CARE ATTITUDE OF STUDENTS

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### *Abstract*

*One of the traditional utilization forms using diverse plants was a self-care ritual, which was anciently previously found in the tradition performed by women in the Qadriyah Palace of Pontianak Sultanate. The self-care ritual was aimed to treat either health-related problems or common diseases. Therefore, this ethnobotany study of the women self-care ritual was purposely implemented through a folding poster media in the tenth-grade sub-material of Senior High Schools, regarding the utilization of biodiversity in the field of cosmetics and medicines. The learning activity was collaboratively carried out with the teachers, so that students can recognize and preserve the varieties of beneficial plants in their environmental surroundings. The class selected as the subject of this study was class of X IPA 2. The collaborative learning process took place in two meetings; beginning with plan 1, performance 1, reflection 1; and plan 2, performance 2, and reflection 2 simultaneously in each meeting, with a duration of 90 minutes. The first cycle successfully implemented the ethnobotanic self-care-based folding poster media, previously performed by women in the Qadriyah Palace of Pontianak Sultanate's environment, which had previously been validated by lecturers and teachers and was declared fit for use. Meanwhile, in the cycle 2, the media used was a flipbook. The results showed that collaborative learning using ethnobotany-based media can promote an environmental caring attitude amongst the tenth-grade students of SMAN 10 Pontianak.*

**Keywords:** *collaborative learning, ethnobotany, utilization of plants.*

West Kalimantan is knowingly rich in plant diversity, which has been widely used for the living needs, inherited from generations to generations (Setyowati, 2005; Pradityo et al., 2016). The branch of science

studying the process of plant utilizations in the traditional way, which represents the relationship between human beings and plants, is called ethnobotany (Suryadarma, 2008; Walujo, 2011). One of the traditional utilisation forms using



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numerous plants, previously found in the tradition performed by the women living in the Palace of Kadriyah – Pontianak Sultanate, was a self-care. Self-care or personal hygiene is an effort to maintain the sanitation and health of personal well-being physically and psychologically. This aims to improve personal health status, to preserve personal cleanliness, to fix inadequate personal hygiene, to prevent from any illness, to boost self-confidence and to create personal beauty (Isro'in & Andarmono, 2012). According to Asmadi (2008), the self-care ritual was performed due to the emergence of health problems and diseases. Therefore, this ethnobotany study of the women self-care ritual was purposely implemented through a folding poster media in the sub-material of biodiversity utilisation in the specific field of cosmetics and medicines.

Materials of the biodiversity utilisation in the both fields of cosmetics and medicines have long been studied alongside the book of the Student Work Sheets (LKPD). Based on the statement of the two interviewed teachers teaching in SMAN 10 Pontianak (July 12<sup>th</sup>, 2018), those materials, however, have not been taught yet with a support of media tools. Interestingly, the folding poster media can accommodate various local plants that are beneficial for both cosmetics and medicines. This is accordingly suitable with the basic competency of National Curriculum 2013 directing to students on the introduction of local potency. The folding poster that is currently used is a visual combination of strongly colourful layout and note to attract people attentions, yet also to plant a firm statement in mind; the poster media is expected to motivate students in studying as it exhibits the usage of

attracting colours and variative sizes in order to draw attention in the learning process (Putri et al., 2013; Megawati, 2017).

The use of media that is attracting student responsiveness in the learning-teaching process is closely related to contents provided in the media itself. One of them is by displaying several plants that have been commonly known by students. The poster media is fully completed with the number of plant species that have been traditionally consumed by the people in the Palace of Kadriyah, Pontianak, with the total of 54 plants families for the purpose of women self-care ritual. The most benefit plant family is from the family of Zingiberaceae, with the following species: tumeric (*Curcuma domestica*), liak (*Zingiber officinale* Roxb.), banglai (*Zingiber purpureum* Roxb.), concave (*Kaempferia galanga*), white temu (*Curcuma zedoria* Berg.), yellow temu (*Curcuma xanthorrhiza*), lempuyang (*Zingiber aromatica* L.), and red liak (*Zingiber officinale* Roxb. var *Rubra*).

All of the plants are widely used in the women self-care practice; they particularly have nine benefits such as (1) facial care, (2) pre/post menstruation care, (3) reproductive health care, (4) pregnancy care and post pregnancy/childbirth, and breastfeeding care, (5) dental and oral hygiene care, (6) eye and eyebrow care, (7) hair care, (8) skin care and (9) nail care. The plant families involved in these treatments are *Gramineae*, *Zingiberaceae*, *Oleaceae*, *Poaceae*, *Pandanaceae*, *Altingiaceae*, *Annonaceae*, *Fabaceae*, and *Cucurbitaceae*.

It is presumed that those beneficial plants should be known by young generations, typically those who are in schools. This is purposely designed to

improve the attitude of students in caring about the environmental surroundings and to increase the awareness of maintaining and preserving those all beneficial plants used by the people in West Kalimantan.

According to the results of the study performed by Priyanto (2013), the student awareness in caring about the neighbourhoods should be trained as early age as possible starting from their earliest education. This consideration is made since the early age of education is a good place to alter attitude, behaviour and perception in students. This is also strongly agreed by Stout & Perry (2013), stating that students are prone to have a positive attitude over their environment after studying the environmental components such as biotic and abiotic components, and the symbiosis of both components. The research conducted by Manurung (2013) also demonstrated that the attitude care for the environment can help students in shaping their actual awareness in preserving natural resources and environment. Based on the previous studies, we are aware in the importance of having the environmental attitude care in the learning process by introducing various kinds of plants utilised by the women in the Kadriyah Palace, Pontianak Sultanate. Therefore, one of the learning processes in transferring this material is by collaborative learning.

Collaborative learning is a situation where two people or more learn or explore something altogether (Santoso, 2013). In this study, the collaborative learning was performed in order to make students and teachers as well as other participating teachers enable to share information and ideas on each other regarding the learning

implementations that were done or postponed.

Collaborative learning can train teacher capabilities socially and emotionally, including in managing classes and providing the learning contents that are more precise and accurate, accordingly to student characters. Besides, in this collaborative learning teachers can also create a learning situation which can supportably shape a critical thinking from each student (Isdaryanti et al., 2018; Dewi et al., 2016).

This collaborative learning has many advantages, including to establish a constructive cooperation and to foster a sense of caring for fellow teachers or fellow students. Through collaborative learning, students and fellow students will establish a better communication while discussing ideas.

In this study, it was carried out the measurement of student attitude during the learning process by using the folding poster method of the women self-care ritual in the Palace of Kadriyah, Pontianak. This attitude measurement is crucially important to the education implementations since it is one of the emphasised components in the National Curriculum 2013.

The implementation of National Curriculum 2013 is more emphasised to vitally foster a sense of awareness and care about the environment, especially in conserving the local potency such as traditional medicines and herbs. This study of the environmental attitude measurement played an important role in forming a generation who is more aware of the environment since the earliest education.

## METHOD

The process of the collaborative learning was performed in a lesson study of two cycles. The phases used in this lesson study consisted of planning, implementation and reflection. In figure 1, it was shown the flowing phases of the lesson study performed.

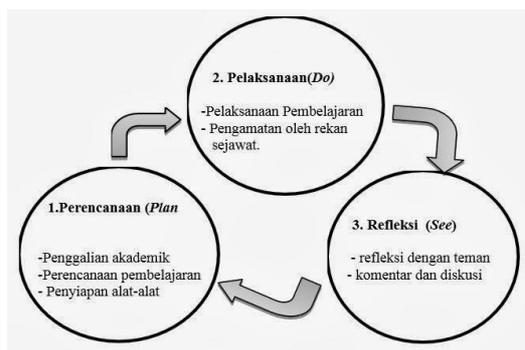


Figure 1. The Cycle of a Lesson Study (Syamsuri & Ibrahim, 2008)

This current study was done by two times of meetings with sub-chapter that was discussed at cycle 1 and cycle 2. The cycle 1 was referred to the plant utilisation as medicines and cosmetics, whereas the cycle 2 was about the plant utilisation for clothing stocks and food stocks. An estimated 50 minutes before the beginning of the first learning activity, it was carried out a meeting with an observer to rehearse all materials of do-not and do-things during the observation session in class. In the meantime, the observation papers were distributed to each observer who had been given time to present inquires if there were some matters of the contents of the observation papers that would like to discuss about. The implementation of plan 1 was formulated in the consideration of the learning process that uses an ethnobotany-based media according to the women self-care practice in the Kadriyah Palace, Pontianak. This learning activity was

performed at the class of X IPA 2. In figure 2, it was displayed the process of plan 1.



Figure 2. Plan 1 was with a teacher model and an observer

During the implementation period, there were two teachers whom played role as the observers. The students involved in this study, during the learning process, experienced some difficulties in providing examples of the kinds of plants that benefit to human life. The benefits of plants as a source of food, clothing, shelter, medicines and cosmetics are generally utilised well by society, yet the students still lack the knowledge in recognizing those beneficial plants. The measurement of a sense of the environmental care was completed by using the observation papers during the ongoing learning activities.

The reflection phase was performed on the same day as the implementation of plan 1 after the process of the open class. Every observer was required to present a result of the measurement of the student sense in caring about the environment during the collaborative learning that had been done before.

## RESULTS AND DISCUSSION

At the open class session of meeting 1, the class was opened by greetings and several questions in order to connect the upcoming materials with

the initial knowledge owned by students. In the core activity, teachers began the class by elaborating the concepts of plant utilisation as medicines and cosmetics with support of the folding poster media.

Every student, who had joined in the learning group, was provided with the Student Work Paper (LKPD) containing several various questions about the kinds of plants that have been beneficial to both medicines and cosmetics in daily life. During the ongoing discussion, each teacher led one group of students and the other groups, who experienced difficulties in understanding the Student Work Paper (LKPD). Group 4 was membered of more students compared to other groups, while Group 1 to 8 were only membered of up to 4-5 pupils. The folding poster media with a size of 1,5m x 1m was displayed in front of the class. Every member of the groups was regularly given a chance to have a look at the media to obtain useful information and data.

The used folding poster media exceedingly charmed the student attention of each group. The content of this media was full of the kinds of plants that were commonly utilised by the society in the Palace of Kadriyah, Pontianak. One thing that specifically was attracting the student attention, particularly female students, was the women in the Palace, who had beautiful, smooth, clean, healthy and bright skin. This triggered an idea of how the women in the Palace treated their skin. Moreover, oral hygiene and eye health were also properly maintained. This became a motivation for those, however for the male students, to obtain some information on how the people in the Kadriyah Palace maintained the eye care to stay healthy. The curiosity of students

resulted in a smooth learning process. Based on the Student Work Paper (LKPD), it was obtained two groups that discovered more than 10 species of the plants that were commonly used traditionally.

Group 2 and 4 were those who successfully discovered 12 plant species generally used in daily life for the cleanliness of limbs. This interestingly appeared for the teachers that the urban lifestyle does not guarantee their people to use modern products frequently. The statement obtained from one of the members in group 4 demonstrated that the habit of using the traditional medicinal plants was inherited from the grandfather and was confirmedly proved the efficacy. One of the plants used by one of the student families in group 2 was hibiscus plant (*Hibiscus rosasinensis*). The leaves of this plant are efficacious for reducing the high temperature of fever; this has been traditionally believed by the family. The processing of these leaves is also easy, instantly squeezed by hands with normal water and left for a while to let the extraction comes out, then the extract is rubbed onto the forehead of a person suffering the high temperature of fever and left for about 3 hours. After that, the temperature will expectedly go down.

The explanation of each group about the several types of medicinal plants was enormously interesting, which made students keeping up. The presentation of the discussion results allocated for about 10 minutes was insufficient, thus, each group was added for more 5 minutes, so that the content of the Student Work Paper (LKPD) could be transferred entirely in the front of the class. The interesting part for the teachers was the students had the initiative to record all the unknown

plants or unused plants from their families. This was one of the improvements in the implementation of lesson study.

Based on the statement obtained from the teachers during the plan activity, the students were basically lazy to take note. If they are not asked to take a note, barely would they have the initiative to record critical objects explained by the teachers. This was contrary to the findings during the first open class. This was indicated that the students fundamentally understood and comprehended that the presented materials in front of the class by other groups were important, and the students took a note without being ordered to do so. This learning style was one of the meaningful learning processes since the students enabled to implement the learning outcome that they obtained to be applied for in daily life. The expressive learning is crucially taught to students (Lamb, 2015).

On the ending activity, the teachers and students thoroughly compiled all the materials by providing a recapitulation table of the plant species and its benefits that have been generally used in the Pontianak city. The next activity was, making a scrapbook from the today's findings and appointing it as a class assignment.

This first learning activity was successfully done as the students were able to study actively and collaborate between students and teachers, students and students, and students and the media that had been going well. The students were highly enthusiastic to attend the next session of the learning activities by inquiring what other types of media that will be used for the next meetings. This indicated that the student was

cognitively ready to study in the next gatherings.

The reflection process was conducted on the same day as the open class session. This activity was initiated by the explanation from the teacher models about the feelings while teaching at the open class session. The impression and message from the teacher models were useful for connecting the contents or findings from the three observers. The observer 1 and 2 stated that this likely learning has never been implemented so that it absolutely became the attractiveness on every student since it was a new learning adaption practised in front of the class. However, according to the observer 1 whom is a Biology teacher, this learning style ineffectively digs the student cognitive so that the students did not feel studying properly but discussing more many things beyond the lessons.

Likewise, stated by the observer 3, this activity was fun enough for the students and prevent them from boredom in the class, however, the responsibility of each student was disappeared. Good learning should keep providing student responsibilities (Huang, 2017). The students, who were reluctant to study and to discuss, were prone to keep quiet, and seldom did the teachers pay attention on that. In addition, demonstrated by the observer 2, the presentation time given to the students was advisedly kept in 10 minutes because the addition of more 5 minutes for the two discussing groups would be not effective for summarising the contents. This was a less attractive learning method to be implemented.

The feedback and suggestions from each observer were the critical things to pay attention so that the next meetings can be properly implemented even better. However, the actual concern

in the learning-teaching process in the class during the open class session was not related to how teachers teach but on how the students study. Therefore, it was advised to be more attentive to the learning process of students. Each observer enabled to point out their findings of the teacher's shortcomings while teaching, yet the expectable concern was from the student's perspective. For instance, when the teachers were less clear on explanation, the observers could analyse and demonstrate the results that the students, from the student's perspective who is less understanding on the teacher's explanation – for example they less focused on, did not take note and listen to the teacher's explanation. Therefore, the teacher models would not feel intimidated during the teaching process.

After the reflection session was ended, the process of plan 2 was then continued. In figure 3, it was shown the process of plan 2.



Figure 3. The Implementation of Plan 2 With the Teacher Models and An Observer

Plan 2 was helpful to arrange the learning process that will be carried out in the next open class session 2. One thing should be noticed was the previous findings of the observers in the open class session 1. The media that had been considerably agreed to use in this plan 2 was flipbook. This media was chosen due to its small size and suitability to be

used by each group. Every group would use one type of flipbook of ethnobotany related to various plants that are beneficial for the source of clothing and food. The total flipbooks used were 8 units and each contained the results of studies performed by the university students from the Biology Education about the plant ethnobotanical as the source of clothing and food.

Besides, there was an agreement about the contents of the Student Work Paper (LKPD) that would be used and the instruments that will be distributed at the end of the meetings. The drafts of environmental care attitude consisted of three indicators: (1) having awareness and gratitude for the existence of plants on earth; (2) having curiosity, critical thinking, and caring for the environment in identifying the roles of plant in human life; (3) using plants wisely and maintaining the balance of the ecosystem in the neighbourhood. Those drafts were eventually modified from (Dewi, 2015).

The implementation of the second open class began with providing apperception in the form of pictures of extinct plant species in West Kalimantan. This extinction was caused by the large-scale planting of oil palm. This attracted the attention of student. There were 6 students who had asked and commented on the existence of oil plant plantation in their home regions. Figure 4 showed the process of the open class session 2.



Figure 4. The process of the open class session 2

During this activity, the situation was calmer compared to the first meeting since there were no longer students who walked back and forth from the class front to observe the contents of the folding poster media provided by the teachers. The learning-teaching process should provide more time in order to let students discussing one another (Clivas, 2018). Each group was persistent in finishing the Student Work Paper (LKPD) at their own groups. Questions arranged in the Student Work Paper (LKPD) were specifically designed to the discussing style.

The presentations were also done smoothly and the selected groups of the presentation in front of the class were those who were unable to present their works in the previous meetings. The presentation done spirally was much more attractive in the learning process (Wood, 2018). The selected students who were responsible to give the presentations were the students who were being picked up randomly by the teachers so that each student in the groups has the same responsibility. This was considered as a new technique in the learning activity in class, also this seemed to attract more student attention.

While the lesson finished, the teacher model and the three observers then performed the reflection session. The conclusion from the results of the reflection session revealed that the students were able to study even better and enabled to identify the kinds of plants that are beneficial in daily life. The learning activity will be much better if properly planned (Wood, 2017; Kundiati & Anggo, 2016).

The measurement of the student sense of environmental care attitude was calculated two times in the activities, which were at the open class session 1

and session 2. The results of data analysis for the measurement was presented in percentage. In figure 5, it was displayed the analysis results in the cycle 1.

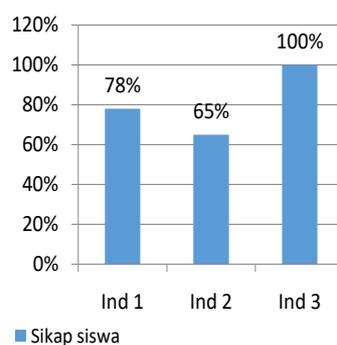


Figure 5. The Analysis Results of The Environmental Care Attitude of Students

Information:

- Ind 1 : having awareness and gratitude for the existence of plants on earth
- Ind 2 : having curiosity, critical thinking, and caring for the environment in identifying the roles of plant in human life
- Ind 3 : using plants wisely and maintaining the balance of the ecosystem in the neighbourhood

In figure 5, it was written the three indicators that had been used. The determination of the indicators referred to (Dwidjoseputro, 1987). The results of the measurement exhibited that the indicator (1) has the awareness and gratitude on the existence of plants on earth with a percentage of 78%. Based on the interview results, it was obtained that, through the learning activity, using the printing media that contained the abundance of plant species which are beneficial in the West Kalimantan, can grow the gratitude sense in the students over the presence of those plants.

The indicator (2) was related to having curiosity, critical thinking, and caring for the environment in identifying the roles of plants in human life with a percentage of 65%. This indicated, through the effective learning displayed by the teacher models could attract attention and might trigger curiosity and critical thinking in the students over the kinds of medicinal plants in their neighbourhoods.

The indicator (3) was associated with using plants wisely and maintaining the balance of the ecosystem in the neighbourhood with a percentage of 100%. This was significantly interesting for the attention of teacher models; this indicated that the learning process involving the surrounding environment could nurture a wise attitude of each student to care more for the environment. This was supported by the opinion of Sutanto (2017), stating that the learning process in classroom is significantly effective in altering student's perceptions and attitude in a positive direction.

If compared to the student attitude at the second open class (Figure 6), it could be concluded that there was an improvement in the environmental care attitude of students in the indicator (1), nor the indicator (2). In figure 6, it was displayed the diagram of environmental care attitude in the cycle 2.

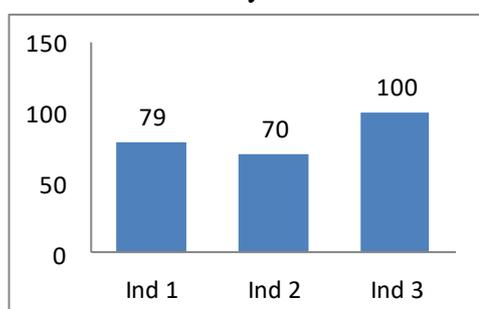


Figure 6. The Analysis data of the environmental care attitude at the cycle 2

Information:

Ind 1 : having awareness and gratitude for the existence of plants on earth

Ind 2 : having curiosity, critical thinking, and caring for the environment in identifying the roles of plant in human life

Ind 3 : using plants wisely and maintaining the balance of the ecosystem in the neighbourhood

The difference in the student attitude in the indicator (1) was merely 1%, while the difference in the indicator (2) was about 5%. This indicated that in the cycle 2, curiosity, critical thinking and environmental care in identifying the roles of plants in human life has increased. This was accordingly agreed by the studies of Raharjo (2010), demonstrating that the student curiosity will increase before the learning activities are not yet complete.

Based on the statement of a Biology teacher from the class of X IPA SMAN 10 Pontianak, it was obtained that, in applying for the National Curriculum 2013 in class, the attitude assessment was the assessment that was very hard to do. This was in accordance with the statement from Hairida (2018), in the study of the assessment of student attitude in learning Chemistry, stated that the teachers experienced difficulties in conducting the attitude assessment. The assessment produced by the teachers was limited to a certain predicate and was not an appropriate observation. Through this collaborative learning, difficulties in assessing the student attitude could be overcome, especially by the teachers from the class of X IPA who had applied for this learning technique in SMAN 10 Pontianak.

In collaborative learning, the student attitude assessment had become

much easier since the measurement of the attitude was carried out during collaborative learning. Collaboration with colleagues or teachers, who have the same background to take part in the learning process for the observers both in the open class sessions and planning activities, have produced a more directed and measurable assessment (Dharma, 2011). The observation sheets and student measurement questionnaires were made accordingly to the timeline based on the sequence materials that synergised with the attitude demands in which students must master from the beginning to the ending of the learning process. This will facilitate the observers in observing the student attitude per individual basis.

In accordance with Mel (2016), the Student Work Paper (LKPD), which had been displayed in collaborative learning with the timeline and material flow that synergised, facilitate students to study and to cooperate with others, including to contribute ideas and to take responsibility for the achievements of learning outcomes individually and group based. With the responsibility, it would ease the observers to measure the attitude of each student (John, 2011).

#### **CONCLUSION AND SUGGESTION**

The collaborative learning using the ethnobotany-based media may improve the environmental care attitude of the students at tenth-grade class in State Senior High School 10 (X SMAN 10), Pontianak. The environmental care attitude, according to the indicator related to the awareness and gratitude on the existence of plants on earth, increased by 1% from cycle 1 (78%) to cycle 2 (79%). In the indicator 2, the variable associated to having curiosity, critical thinking and environmental care

in identifying the plant roles in human life, also experienced the rise about 5% in the cycle 1 (65%) to cycle 2 (70%). In the meantime, the indicator linked to the wisely use of plants in maintaining the balance of the ecosystem in the environment, both in cycle 1 and 2, obtained the highest percentage (100%).

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