PROCEEDING

ISBN: 978-602-8043-84-7

Bengkulu International Conference on Science and Education (BICSE - 2017)

“Breaching international boundaries to share scientific research and advance education”

Rectorate Building 3rd Floor, University of Bengkulu
December 14 – 15, 2017

Invited Speakers:

Dr. Corey Johnson
University of North Carolina–Greensboro, USA

Dr. Jay Lennartson
University of North Carolina–Greensboro, USA

Dr. Ian Singleton
PanEco Foundation, Switzerland

Organizer:
Fakultas Keguruan dan Ilmu Pendidikan
Universitas Bengkulu
Bengkulu International Conference on Science and Education (BICSE - 2017)

“Breaching international boundaries to share scientific research and advance education”

Chief editor: M. Lutfi Firdaus, Ph.D.

FKIP UNIB Press, 2018

ISBN: 978-602-8043-84-7

Editor : Annisa Puji Astuti, Hadi Apriyoanda
Layout : Hadi Apriyoanda
Cover Design : Deni Parlindungan

Publisher : Unit Penerbitan dan Publikasi FKIP UNIB
Address : Gedung Lab Pembelajaran FKIP Universitas Bengkulu, Jalan WR.
Supratman, Kandang Limun, Bengkulu 38371

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Bengkulu International Conference on Science and Education (BICSE - 2017)

“Breaching international boundaries to share scientific research and advance education”

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PREFACE FROM ORGANIZING COMMITTEE

The Bengkulu International Conference on Science and Education (BICSE-2017) was held from 14 – 15 December 2017, in Bengkulu, Indonesia. The conference is organized by Faculty of Teacher Training and Education, University of Bengkulu. The conference was hosted in the rectorate building of University of Bengkulu and new hall building of the Faculty of Teacher Training and Education located in the Bengkulu city center.

This conference was organized by Faculty of Teacher Training and Education, University of Bengkulu, which was attended by more than 100 registered presenters and participants. Invited Speakers include Dr. Jay Lennartson, Dr. Corey Johnson, and Dr. Ian Singleton. The theme of the conference is “Breaching international boundaries to share scientific research and advance education.” The range of topics covered by BICSE 2017 are experimental, theoretical and empirical papers includes, but not limited to (1) Scientific research, (2) Science, physics, chemistry and biology, (3) Teaching, learning, media, and assessment in education, (4) Teacher education, (5) Teaching technology, (6) Research on education, science, and in between, and (7) Advance education.

Finally, we thank all the participants of BICSE 2017, everybody who helped in the organization, all sponsors, the PEER-project supported by USAID, and we are looking forward to meeting you again at BICSE 2019.

Bengkulu, February, 2018
BICSE Organizer,

M. Lutfi Firdaus, Ph.D
Chairman
PREFACE FROM PEER PROJECT

Principal Investigator (PI) of Sumatran Turtles Conservation Project

There is a clear distinction between scientists and science teachers in Indonesian universities, with scientists focusing on pure biology (science) and science teachers focusing on learning biology (pedagogy). Some educational institutions in Indonesia still emphasize this dichotomy between content and learning, which has been noted as a classical problem in science education. The difference between a scientist identity and a science teacher identity is only where to place the emphasis. I believe that both science and learning research capacity to show that these two identities can co-exist in a single individual and that can be very beneficial. In the meantime I also witnessed the facts that Science education at the K-12 levels in Bengkulu does not focus on biodiversity. Fieldwork is rarely included as an instructional technique at any educational level, and there is little focus on local conservation issues. Bengkulu University (UNIB) recently started a graduate program for teachers with the theme of “Natural Conservation Education for A Better Life”.

In conjunction with this graduate program, UNIB has also started a pioneering conservation effort, “UNIB Campus, A Safe Home for Turtles,” with educational components at the K-12 level and at the university as part of the Science Teacher Education curriculum track. On the basis of the description I feel that the development of science teachers through the experience of science and learning research is one option for the improvement of science education in locations similar to Bengkulu.

Implementation of science and learning research in science teacher education was not easy. It requires a long discussion and openness of the existing dichotomy paradigm. Students of biology education, for example, usually do not easily answer with a short sentence when asked: “What is the difference between biology and pure biology?” Some of them answered; “We study biology according to the curriculum demands where we will teach”. I communicated with some science education experts, among others, Dr. Catherine Matthews. She is a science educator at the University of North Carolina Greensboro (UNCG), and is also Principal Investigator (PI) on the National Science Foundation (NSF) -funded project; "Herpetology Education in Rural Places and Spaces". Matthews and I visited each other, wrote some manuscripts, and submitted a number of research proposals including titled; "Developing science and learning research capacity of Bengkulu University in ex situ conservation of Sumatran freshwater and terrestrial turtles". The proposal is funded by USAID through the Partnerships for enhanced engagement in research (PEER) project for the period of December 2015 - November 2018.

The main goal of this PEER project is to develop both science and learning research capacity through cooperation between UNCG and UNIB using the field of herpetology as a venue to improve conservation education and, indeed, conservation itself. Furthermore the cooperation is designed to achieve the following goals; (1) identify some safe habitats for five species of turtles, (2) increase science and learning research capacity through the thesis research of nine graduate students, (3) develop teaching modules, (4) develop both indoor and outdoor learning resources, and (5) establish a new teacher training center in herpetology and environmental education on the green campus of UNIB. This project will
support the spirit of the program “UNIB Campus, A Safe Home for Turtles,” which is a novelty for Indonesia. The existence of the turtles on the UNIB campus will be a learning resource for conservation education for the young people in Bengkulu. This model of conservation efforts through educational approaches is designed to be completed over three years, as an attempt to improve the competence of biology teachers in Bengkulu and other provinces of Indonesia.

As the PI of Sumatran Turtles Conservation Project, I am very excited with Bengkulu International Competence on Science and Education 2017 (BICSE 2017). BICSE 2017 is an excellent forum for exchanging experiences on science and learning research. Hopefully in the next, BICSE becomes an annual regular agenda. Welcome to Bengkulu. Congratulations to do your best for science education.

Dr. Aceng Ruyani, MS
Principal Investigator
GENERAL TIME SCHEDULE

Venue: University of Bengkulu (main campus)
   Jl. WR. Supratman, Kandang Limun, Bengkulu 38371
Plenary session: Rectorate of University of Bengkulu, 3rd floor – main meeting room
Parallel and poster session: Graduate School of Science Education office hall, 3rd floor

Day 1: December 14, 2017
08:00 – 08:45 Registration
08:45 – 09:45 Opening ceremony
   Traditional dance
   Singing “Indonesia Raya”
   Prayer readings
   Speech 1: BICSE chairman
   Speech 2: Dean of Faculty of Teacher Training and Education
   Speech 3: Rector of University of Bengkulu
   Photo session
   Chorus “Heal the World”
09:45 – 12:00 Plenary session
   Dr. Corey M. Johnson
   Dr. Jay Lennartson
   Dr. Ian Singleton
12:00 – 13:00 Lunch break
13:15 – 13:45 Poster session
13:45 – 16:00 Parallel session (5 rooms, each presentation 12 minutes)
16:00 – 16:30 Closing
   Best oral and poster presenter announcement

Day 2: December 15, 2017
Bengkulu City Tour
Location: Fort Marlborough, Soekarno’s seclusion house, Anggut souvenir market, Long beach, etc.
Please register first at registration desk on December 14, 2017.
FLOOR PLAN

a. University of Bengkulu (Main Campuss)

b. Floor Plan for Parallel and Poster Session

Notes:

1. Rectorate of University of Bengkulu, 3rd floor – main meeting room (Plenary session)
2. Office of Graduate School of Science Education (Parallel and poster session)

Notes:
Room name: Office of Graduate School of Science Education
Place: 3rd floor
Poster Session : Room 1

Room Number (Parallel Session):
1. Room Group 1
2. Room Group 2
3. Room Group 3
4. Room Group 4
5. Room Group 5
6. Room Group 6
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Examining environment and development tradeoffs through the Resource Nexus (RN): The case of urban governance

ABSTRACT

With the publication of the United Nations’ Sustainable Development Goals and the Paris Agreement on climate, and a host of other multilateral agreements, governing environmental change is front and center in global governance. Now attention turns to the challenges of implementation, measurement, and metrics, especially in the arena of natural resource use. The resource nexus (RN) approach has been offered as one of escaping the trap of individual resource categories by critically engaging the interlinkages between two or more natural resources used as inputs into socio-economic systems. This presentation draws on work with a collaborative network of RN scholars, first providing a brief overview of the concept and its relationship to environmental change, sustainable development, and security. It then looks at the specific case of RN issues in urban spaces, where an ever increasing share of the world’s population lives. Cases from South and East Asia are used to illustrate the potential—and some of the limitations—of RN approaches to help us understand and better address the environmental consequences of resource extraction and consumption in cities.
The Seven Pillars of Environmental Destructiveness

ABSTRACT

America is the global leader in per capita emissions of greenhouse gas emissions as a result of environmental behaviors and attitudes that are antithetical to environmental sustainability. My talk will highlight the seven key American behaviors that have proven so detrimental to the global environment and will explore ways in which such behaviors and attitudes can be changed so that developed and developing countries can function in a more environmentally sustainable manner.
Dr. Ian Singleton

Director
Sumatran Orangutan Conservation Programme
PanEco Foundation, Switzerland

Saving Sumatra’s Orangutans

ABSTRACT

Orangutans are Great Apes, along with Chimpanzees, Bonobos and Gorillas. 2 species of orangutan were recognized, the Sumatran orangutan (Pongo abelii), and the Bornean orangutan (Pongo pygmaeus), but a recent scientific publication announced the existence of a third, new species – the Tapanuli orangutan (Pongo tapanuliensis) in the Tapanuli region of North Sumatra. Most orangutans in Sumatra reside in the Leuser Ecosystem, straddling the border of Aceh and North Sumatra provinces. SOCP surveys suggest there are only around 13,500 Sumatran orangutans remaining, and less than 800 Tapanuli orangutans. Threats to both species include habitat conversion for palm oil, the construction of new roads and the development of new so-called renewable energy projects. The Tapanuli orangutan populations is also already fragmented in at least 3 smaller sub populations and corridors to reconnect these fragments are urgently needed. The paper will also describe some legal successes against palm oil companies illegally burning orangutan habitat in the Tripa swamps region of the Leuser Ecosystem and how groups of dedicated individuals can make a difference in conservation in Indonesia. The paper will also argue that the economic justification for continued destruction of Sumatra’s remaining forests habitats is weak, at best.
6. LESSON DRAWING WITH TAT DYES

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1Doctoral Program of Educational Sciences (Teacher SD Negeri 01 Pondok Kubang)*Email: lindasilawati@gmail.com

ABSTRACT

In the learning activities of drawing with the TAT media (Tanah, Arang dan Tumbuhan)/(Soil, Charcoal, and Plants) that exist around the environment either flowers, leaves, fruit, seeds, wood, bark, charcoal and clay can be utilized as a coloring material in drawing learning. With TAT materials can develop creativity and produce art products that are environmentally friendly. Implications in teaching and learning activities need to optimize the role of the teacher shifting from the informants to facilitating learning by providing the various learning resources needed, stimulating the spirit of learning, giving opportunities to test or practice learning outcomes, providing feedback on learning progress, and helping students that what has been learned to be useful in his life. Through drawing learning with TAT can be used with abrasive techniques, and using a brush. With the aim to improve the certifi city of grade 6 students of SDN 02 Taba Penanjung and can guide students to master the competence of skill, especially to know natural color, to blend color and to use TAT in environment. So with TAT dye (soil, charcoal, plants) can improve the creativity of grade 6 students of SDN 02 Taba Penanjung in drawing learning.

Keywords: Creativity, Drawing, TAT

1. Introduction

Artistic and skill education have in the harmonious personal development of the participants by paying attention to the developmental needs of the child in achieving multi intelligence this is in line with the opinion of Gardner in [1] intelligence consists of: 1) lavish intelligence, 2) logical intelligence, 3) spatial intelligence, 4) musical intelligence, 5) kensesthetic intelligence, 6) interpersonal intelligence. 7) intrapersonal intelligence, 8) naturalist intelligence, 9) existential intelligence. This intelligence when considered early will form a democratic attitude that enables a person to live civilized and tolerant in a culturally diverse society and culture.

Field of fine arts, music, dance, and skill have its own peculiarities in accordance with the rules of each science. In art and skill education, artistic activities must accommodate these peculiarities contained in the experience of developing conceptions, appreciations, and creations. All of this is gained through exploring the elements, principles, processes, and techniques of work in the diverse cultural contexts of society. The result of the observation of the students in drawing the class still tends to be considered unimportant in their implementation, it is proven by the students who are not so enthusiastic in the drawing lesson, they tend to think that the learning of drawing is a non-essential learning because sometimes there are schools that do not program the learning drawing on the final examination of the school in grade VI students. When learning drawing that they make is still downhill like the pictures our grandmother made even their parents like the picture of two mountains and the sun peeping from between two mountains. For that reason on the learning of drawing (art) writer do simple activity based on environmentally friendly that will produce beautiful product in art field which is packaged in creative, innovative, interesting and fun learning strategy.
Creativity is directly related to productivity and is an essential part of problem solving. How to improve the creativity that is still hidden in students? According to Wankat and Oreovoc in [2] improve student creativity can be done by:

1. Encourage students to be creative, can be done in several ways, among others: (1) Develop some creative problem solving for a problem, (2) Give some ways to solve a problem, (3) Make a list of some possible solutions to a problem

2. Teach some students some creative methods (1) Develop ideas as much as possible, (2) Develop ideas based on the ideas of others, (3) Do not give criticism when development of ideas, (4) Evaluating existing ideas, (5) summing up the best ideas.

3. Accepting creative ideas produced by students (accept the result of creative exercise), the most important thing in this stage is to accept student ideas and help students build more brilliant ideas. Operationally this can be done by: (1) Noting the positive aspects of the idea, (2) Noting the negative aspects of the idea, (3) Noting the very interesting things of the idea.

The creative-productive learning strategy has several characteristics that distinguish it from other learning strategies. According to [3] the characteristics are:

a. Intellectual and emotional student involvement in learning.

b. Students are encouraged to discover / construct their own concepts under review through interpretation done in various ways such as observation, discussion or experiment.

c. Students are given the opportunity to take responsibility for completing joint tasks.

d. Basically to be creative one must work hard, dedicated, enthusiastic and confident.

Application of the above strategies in drawing activities will spur the creativity of students and will manghasilkan works full of innovation. The concept of the environment around the student can be easily mastered by students through observation on concrete situations. Utilization of plants, charcoal, and soil are examples of media from the environment that can be used in learning. The positive impact of the implementation of the environmental approach of students can be encouraged attitude curiosity about something that exists in the environment. This fact can be connected with the four pillars of education according to UNESCO in [4] ie learning to know, learning to be (learning to be his identity), learning to do (Learning to do something ) and learning to life together (learning to work together) can be implemented through learning with an environmental approach that is packed in such a way by the teacher.

Indonesia is one of the world's largest biodiversity countries after Brazil, where there are more than 25,000 species of plants according to Ersam in [5]. Biodiversity is one of the most important things for socio-economic life and even human culture. But in fact during this biodiversity has not been used as a medium in learning that ideally done as a source of learning teachers. Several types of plants have been widely used for traditional medicinal materials, raw materials handicrafts, industrial and natural dyes. But not all plants produce stable dyes or have good fastness so they need to be tried and selected which have color Below are the names of the examples of natural material names used in TAT coloring such as table 1.
Table 1. Natural material names used in TAT coloring

<table>
<thead>
<tr>
<th>No.</th>
<th>Local Name (Javanesa)</th>
<th>Part of The Plant</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tom, Nila</td>
<td>Leaves</td>
<td>Blue</td>
</tr>
<tr>
<td>2</td>
<td>Tingi</td>
<td>Barks</td>
<td>Brown</td>
</tr>
<tr>
<td>3</td>
<td>Putri Malu</td>
<td>Flowers, leaves</td>
<td>Yellow greenish</td>
</tr>
<tr>
<td>4</td>
<td>Tegeran</td>
<td>Stems</td>
<td>Yellow</td>
</tr>
<tr>
<td>5</td>
<td>Jambal</td>
<td>Barks</td>
<td>Beige</td>
</tr>
<tr>
<td>6</td>
<td>Nangka</td>
<td>Stems</td>
<td>Yellow</td>
</tr>
<tr>
<td>7</td>
<td>Potromenggolo</td>
<td>Flowers, leaves</td>
<td>Green</td>
</tr>
<tr>
<td>8</td>
<td>Jati</td>
<td>Young Leaves</td>
<td>Red brownish</td>
</tr>
<tr>
<td>9</td>
<td>Apokat</td>
<td>Leaves, Skin fruits</td>
<td>Green brownish</td>
</tr>
<tr>
<td>10</td>
<td>Mengkudu</td>
<td>Skin of roots</td>
<td>Red</td>
</tr>
<tr>
<td>11</td>
<td>Mahoni</td>
<td>Stems, leaves</td>
<td>Brown</td>
</tr>
<tr>
<td>12</td>
<td>Kesumba</td>
<td>Membrane of seeds</td>
<td>Orange</td>
</tr>
<tr>
<td>13</td>
<td>Pinang/jambe</td>
<td>Fruits</td>
<td>Brown</td>
</tr>
<tr>
<td>14</td>
<td>Bunga sepatu</td>
<td>Flowers</td>
<td>Violet</td>
</tr>
<tr>
<td>15</td>
<td>Mangga</td>
<td>Leaves</td>
<td>Green</td>
</tr>
<tr>
<td>16</td>
<td>Kepel</td>
<td>Leaves</td>
<td>Brown</td>
</tr>
<tr>
<td>17</td>
<td>Srigading</td>
<td>Flowers</td>
<td>Golden yellow</td>
</tr>
<tr>
<td>18</td>
<td>Jambu biji</td>
<td>Leaves</td>
<td>Dark green</td>
</tr>
<tr>
<td>19</td>
<td>Randu</td>
<td>Leaves</td>
<td>Grey</td>
</tr>
<tr>
<td>20</td>
<td>Puring</td>
<td>Leaves</td>
<td>Purple</td>
</tr>
</tbody>
</table>

In addition to the natural color of the plant (organic) according to [5] there is an Inorganic natural color materials, namely: 1). Rocks, earth, metal compounds. 2). The organic compounds are heated so that the inorganic elements are left behind: lime, charcoal / carbon, etc. The soil is mainly clay or clay, containing natural color materials. Clay colors arise due to the iron oxide content, especially iron and organic content of humus. The higher the iron content the brown the soil color and the higher the humus content the black color of the soil. Here are examples of clay and kitchen charcoal that can be used.

(a) Charcoal
(b) Soil

Picture 1. (a) Charcoal (b) Soil

The purpose of learning drawing using TAT is: 1). Developing the learning of drawing (art) becomes an active, creative, innovative, interesting and fun learning that can create a conducive learning climate. 2). Utilizing materials that exist around the students as a learning resource that can be used as a source of learning so as to foster students' love of the environment. 3). Improving students' creativity in art learning in particular and in other general learning.

Learning outcomes using TAT coloring are expected to provide benefits: 1) For teachers, as input materials apply learning strategies on learning drawing (art). 2). For Students, this learning is expected to improve students' keativitas and ability in science, process skills, and caring attitude towards the environment can be used as a source of learning. 3). For the school is
expected to always motivate teachers to improve their performance by providing opportunities and facilities to teachers to improve the quality of learning through learning and research innovation.

2. Methods

The writing of scientific paper is the work of BEST PRACTIC with the subject of grade 6 students of SDN 02 Taba Penanjung Bengkulu Tengah, with the number of students 11 people. In this drawing lesson, two meetings were held. Implementation of learning still refers to the basic competence and competence standards such as tertat following the source of the Director General of PMPTK [6]. Competency Standards and Basic Competencies of Cultural Arts of Primary / MI Skills. SK and KD class 6 semester 2 in table 2:

<table>
<thead>
<tr>
<th>Table 2. Competency Standards and Basic Competencies Class VI Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competency Standards</td>
</tr>
<tr>
<td>10. Expressing yourself through artwork</td>
</tr>
</tbody>
</table>

Before the learning process begins the author memhami syllabus and pouring in the plan of learning implementation, preparing all the tools and materials needed to help the learning process. In the learning tool drawing with TAT coloring the author designed and compiled the following learning steps:

2.1 Design and basic concepts of learning are designed

The basic design and concept of learning is designed because it has advantages in the application of this learning are as follows: 1). Learning strategy is a learning strategy that emphasizes the development of cognitive, affective and psychomotor aspects in a balanced way, so that learning through this strategy is considered more meaningful. 2). This learning strategy can provide space for students to learn according to their learning style. 3). This learning strategy is a strategy that is considered in accordance with the development of modern learning psychology that considers learning is the process of behavior change thanks to the experience. 4). This learning strategy can serve the needs of students who have above average skills. That is, students who have good learning ability will not be hampered by students who are weak in learning. 5). This learning strategy is cost effective and easy to do. 6). Can be done in schools anywhere, even in remote areas and can foster student creativity. 7). Tools and materials used environmentally friendly, easy to obtain, and memamfaatkan environment as a source of learning.

2.2 Kind of Designed Learning

Learning that the author did was to design drawing learning by utilizing TAT coloring in the environment around the students. Active, creative, innovative, interesting and fun learning that can create a conducive learning climate. The innovative media is simple and the tools are cheap and easy to find students that the author designed and successfully created by students, among others:

1) Drawing by using the coloring media of the plant (image expression)
**Picture 2.** examples of Flowers, Leaves, and Turmeric

2) Drawing using charcoal media (image expression)

**Picture 3.** Charcoal

3) Drawing by using clay (clay) (image expression)

**2.3 Tools and Materials**

1) Tools

The tools used to draw using natural colors include:

1. Pounding To smooth
2. Used mineral water glass.

**Picture 5.** Lumpang and Blender

3. Brush to paint

**Picture 6.** used mineral water glass

4. Knife to cut

2) Plant

**Picture 7.** Brush

**Picture 8.** Knife
Flowers such as bougainvillea, hibiscus, embarrassed daughter, betel, cassava leaf, katu leaf, turmeric bulb and other plants are not dangerous in its use. The following growths are easy to find by students like the pictures below:

![Picture 9. Bougainvillea](image9.png) ![Picture 10. hibiscus](image10.png)

**Picture 9. Bougainvillea**  **Picture 10. hibiscus**

![Picture 11. Red Spinach Flowers](image11.png) ![Picture 12. Turmeric](image12.png)

**Picture 11. Red Spinach Flowers**  **Picture 12. Turmeric**

![Picture 13. Charcoal](image13.png) ![Picture 14. Clay](image14.png)

**Picture 13. Charcoal**  **Picture 14. Clay**

2.4 *The process of making TAT dye is:*

a) **TAT Making Technique**

1) Used directly

Natural color materials can be used directly by rubbing on paper or cloth. Almost all plants that have color pigments can be used as dyes, but they are less stable.

![Picture 15. hibiscus flowers and henna flowers](image15.png)

**Picture 15. hibiscus flowers and henna flowers**

2) Pounded or Blended

Flowers, fresh leaves can be processed by pounding or blending. The process of making flowers or leaves cut into pieces first then crushed or blended with water until smooth. After finely pour and strain. Color is ready for coloring paper or cloth by color colet on paper or cloth.
b) Natural Color Use Technique

1) Rubbing Technique

Plants are taken in fresh condition can be directly used to color paper or cloth by rubbing without going through the washing process.

2) Coloring Technique With Brush

Dyestuffs that have been blended or crushed, directly used in a way satisfied on the paper media in Picture 18:

2.5 Assessment Indicators

The work of children in learning drawing with SBC subject TAT with KKM is 80. The determination of KKM is obtained through discussion with collaboration team which by considering: 1) Student Intake. 2) Complexity. 3) Carrying capacity. The instruments used consisted of attitude and product assessment. The components of product assessment are as follows: 1) Conformity with theme, 2) Perfection of cultivation blends color, 3) Creativity, 4) Original, 5) Completion rate. Each component is assessed with a range of values 1-5, with an assessment indicator of a score of 1 if only the theme, value 2 if perfection blends color and according to theme, value 3 if creativity idea, perfection blends color and according to theme, value 4 if original work, the idea of creativity, perfection blends color and according to theme and value 5 if the work is finished when the original work, when the idea of creativity, perfection blends color and according to the theme. In the scoring above can be equalized with a score of tens value that is: 1) the value of 1 is equivalent to 20, 2) the perfection blends the color and according to the theme, the value of 2 equal to 40, 3) the value of 3 equal to 60, 4) equal value 80, 5) value 5 equivalent to 100. The indicators of attitude assessment with a range of
values 4. Very Enthusiastic. 3. Enthusiastic. Sometimes Enthusiastic. 1. Not Enthusiastic. This form is created in tabular form.

3. Results And Discussion

3.1 Data Result Learning

<table>
<thead>
<tr>
<th>The First Meeting</th>
<th>The Second Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Appointed components (products)</td>
</tr>
<tr>
<td>1</td>
<td>Fitness with theme</td>
</tr>
<tr>
<td>2</td>
<td>Perfection of being color</td>
</tr>
<tr>
<td>3</td>
<td>Creativity</td>
</tr>
<tr>
<td>4</td>
<td>Originality</td>
</tr>
<tr>
<td>5</td>
<td>Level completion</td>
</tr>
</tbody>
</table>

Note: 1 = no enthusiasm 2, sometimes enthusiastic 3. Enthusiastic 4. Very enthusiastic

From the table above can be seen how the learning process of drawing with TAT coloring students of class VI SDN 02 Taba Penanjung during two meetings. At the first meeting students are seen sometimes enthusiastically follow the learning because the learning experience is very new for them. And the second meeting attitudes students enthusiastic this can be seen in the assessment component is: 1) the suitability of the theme with the number 145 while at the first meeting only 125, 2) the perfection of cultivation blends the color at the second meeting with the total value of 425 and student attitudes are very enthusiastic than the value of the first meeting 405 with the attitude scale students are enthusiastic in following learning, 3) creativity with total score at the second meeting 250 attitude scale is very enthusiastic compared to the second meeting with 230 product value and enthusiastic value, 4) originality with value at second meeting 140 and enthusiastic student attitude value compared with the value of the present first 120 and student attitudes still looks sometimes enthusiastic, 5) the level of completion with the value of the second meeting 140 with the student attitudes enthusias attitudes in following the learning, at the first meeting the value of student product 120 with the student attitudes sometimes occasionally enthusiastic in following the learning.

So the table value of learning outcomes with TAT coloring for two times cool students with the task given by the teacher. This can be seen from the results of student work is very satisfactory, especially on the second aspect both individually and in classical.

3.2 Discussion

At the first meeting the teacher explained the learning steps using TAT and easy to find students in the surrounding environment. At the beginning of the student's learning looks still hesitant to try what the teacher has explained. At the second meeting from the beginning of the student learning looks so enthusiastic even on the aspects of blending the colors of students look very enthusiastic. With some of their language chatter that makes the learning atmosphere livelier. With the guidance of teachers the students try to draw with natural dyes according to
the techniques and langkah-steps that have been described teachers. Each student is assigned to draw 1 picture with the charcoal, 1 picture with clay, 1 picture with the color of plants.

Students are given the opportunity to express combining colors they like. And even more interesting in this learning the students also try to mix some colors into like soil mixed with turmeric that has been smoothed with a dye of cassava leaves produce a more attractive color, from a combination of several tigers of plants and soil. Occasionally between them polish each other in the face so they look funny but beautiful and learning is very exciting.

After the learning is finished students with the teacher prepare a place for the class exhibition of their work from each picture of each 1 picture of the TAT dye.

![Example of student work using TAT media](image)

**Picture 19.** Example of student work using TAT media

4. **Conclusion**

By using TAT media around students' environment, flowers, leaves, fruits, seeds, wood, bark, charcoal and clay can be used as a coloring material in drawing learning. With rubbing materials and techniques, colet using brushes, the technique can develop creativity and produce interesting student works and they express their ideas with TAT. In addition to producing interesting works among students intertwined the character of cooperation, love the environment and curiosity. especially recognizing natural colors, making natural colors, using natural colors that exist in the environment and the application of colors on paper and cloth media in a simple. And the introduction of natural dyes that exist in the environment.

**suggestion**

Implications in teaching and learning activities need to optimize the role of the teacher shifting from the informants to facilitating learning by providing the various learning resources needed, stimulating the spirit of learning, providing opportunities to test or practice learning outcomes, providing feedback on learning developments, and assisting that what has been learned will be useful in his life. Through drawing learning with TAT coloring is intended to improve students' credibility and can guide students to master the skills competence, especially to recognize natural colors, to blend natural colors, to use natural colors that exist in the environment as an alternative to learning innovation.

**References**


