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”

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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 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)

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)

b. Floor Plan for 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.
69. Improving Competency Preparing Rooms For Guests Through Assure Model Based on Peer Tutor Method

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ABSTRACT

The purpose of this research is to find out whether application of assure model with peer tutor method can improve student learning activity and can improve student competence in preparing room for guest. This research uses research of PTK collaboration and quasi experiment. The Action Research conducted through a collaborative work process between the author and the principal and the subject teacher prepares the guest room. The results showed that application of assure model with peer tutor method can increase student learning activity. The application of assure model with peer tutor method can improve students' skill in preparing guest room. The conclusion of this research is as follows: 1) Application of assure model based on peer tutor method can increase student learning activity; 2) The application of assure model based on peer tutor method can improve students' skill in preparing guest room; 3) Supporting factors and inhibiting the application of assure model based on peer tutor method is students have high ability, passion, and curiosity, student's interest and interest in learning process, students willingness to listen high enough, support conducive from principal, good and harmonious cooperation between teacher and researcher, support and cooperation of parents with good enough school; 4) the inhibiting factors of the implementation of peer tutor methods and video media, among others.

Keywords: Assure model, peer tutor method, and competence prepare room

1. Introduction

The instructional intentional purpose of "Preparing a Room for Guests" is to provide the skills and knowledge required to prepare a room for guests in a commercial accommodation business. Based on the instructional intention of the "Preparing the Guest Room for the Subject" subjects, it requires the knowledge and skills of the students to prepare hotel rooms for guests.

Basic Subject Competencies Preparing Rooms For Guests is arranging fixtures and trolley, access to rooms for service, bedding, cleaning and tidying up rooms, and cleaning and storing trolley and equipment. Efforts to achieve these basic competencies are pursued by providing theory and practice. The composition between theory and practice is 30% to 70%. This shows that the practice is larger and will greatly determine the level of student competence. The obstacles faced are the practice facilities of the subjects, ie the practice room is very limited, so the students' opportunity to carry out the practicum is very limited.

The limitations of these practice rooms make the students' opportunities to practice the material so poorly that it impacts on less-than-satisfying learning outcomes. To overcome these obstacles applied assure model based on peer tutor method in learning to prepare room for guest. In addition, also used a video media in the presentation of the subject matter.

[1] state that peer tutors are one or more appointed students assigned to assist certain students with learning difficulties. Peer tutor methods have advantages such as: 1) peer languages more easily understood, 2) Students will be more active to ask because there is no distance between them,
and 3) Time spent will be more effective and efficient. In addition, combined with assure learning model will make the learning process into a system.

Various efforts have been made by the government to make learning innovations in education. Innovation of learning is done usually pay attention to three important reasons, namely effective learning, efficient learning and comfort. Effective learning is a learning that can bring students to achieve the desired learning objectives or competencies. Efficient learning has the meaning of learning activities that take place using relatively little time and resources, but produces beneficial results for students or the community, while convenience means learning resources, media or learning aids, methods that are determined in such a way as to provide a passion teaching and learning for students and teachers [2].

Pribadi states that in order to facilitate students in achieving the desired competencies, teachers need to master the ability to design, implement, and evaluate learning, so as to create effective, efficient, and engaging learning [2]. This can be done the application of assure learning model. Viewed from the structure, then ASSURE is formulated based on certain verbs that are analyze, state, select, utilize, require, and evaluate. All of these verbs refer to the activities or work that the teacher must do to manage the learning process [3].

The ASSURE learning model contains steps that match its name: (1) analyzing student characteristics; (2) establishing learning objectives or competencies; (3) selecting methods, media and teaching materials; (4) using learning materials and media; (5) involving students in the learning process; and (6) evaluation and revision. The ASSURE model step according to Anitah is to analyze the characteristics of students; formulate learning objectives, choose methods, media, and materials; using media and materials, asking for student participation; and evaluation [4].

Learning ASSURE model can improve students' understanding on the subjects of preparing the guest room as well as involving students directly in the learning process and motivate students to learn more about the material. Prepare the guest room, so that students can improve the optimal understanding of the subjects prepare the guest room. In addition, in advanced times with the existence of science and technology, especially information technology, is very influential on the preparation and implementation of learning strategies. Through these advances the teachers can use various media in accordance with the needs and learning objectives. Therefore, it is known that assure learning model can influence student learning outcomes. The same thing as research conducted by Armita Jayanti, Putra, and Suryaabadi, said that there is influence of applying ASSURE audiovisual media assisted model to student learning result of Civics [5]. Then research conducted by Mega Aldila, Jenny Poerwanti, and M. Ismail Sriyanto, it is known that through the use of ASSURE model can improve the skills of writing poetry [6].

From the previous research above, the learning model used is the assure model of student learning outcomes. Therefore, the authors redeveloped the application of assure.

Models based on peer tutor methods to improve the skills of students preparing rooms for guests. In these subjects, there are still many students who have difficulty in preparing room activities for guests. This is related to the efficiency of time and hotel standards. The standard time required to prepare an ideal guest room is a maximum of 30 minutes. In fact some students spend more than 30 minutes, so not yet meet the provisions of the time in accordance with hotel standards. To overcome these problems it is necessary help of learning video media with peer tutoring.

2. Methods

This research uses research of PTK collaboration and quasi experiment. The Action Reaserch conducted through a collaborative work process between the author and the principal and the subject teacher prepares the guest room. According to Hopkins in Kusumah and Dwitagama (2011), classroom action research is a study that combines research procedures with substantive action, an
attempt to understand what classroom action research is characterized by continuous improvement to achieve the objectives of the study [7].

Subjects in this study were students as a class of action that class XI, amounting to 89 people consisting of 13 men and 76 women. Then the learner as experiment and control class that is class XI PH 1 and XI PH 2 SMK.N 3 Bengkulu City each class amounted to 30 learners. The basic selection of this research subject is because based on observation and interview with teacher board, the learning process of this class is still centered on teacher (teacher centered), learners less experience in constructing their own knowledge so that learners' learning achievement become low.

In this classroom action research the data collection techniques use observation sheet, test, and documentation. Then data analysis is done by finding the average value, classical learning completeness, and t-test. While the withdrawal conclusion is done gradually to obtain high degree of confidence, in this study drawing conclusions made up to 85% of students are able to obtain a minimum score of 65. In the technical manual assessment of students are said to be completed individually if the value of at least 65, whereas classical said to be complete learning if the number of learners who completed individually reached 85% which has achieved absorption more than equal to 70%. T-test is used to see the difference of learners' learning outcomes, either between each cycle or between the control class and the experiment class. To analyze the comparison used t-test formula.

3. Results and Discussion

Based on data of research result known that learning by using assure model based on peer tutor method, student learning competence can be improved. This is in line with the theoretical foundations of this research which says that video media has various advantages to achieve better student learning outcomes. [8] also mentioned that learning with ICT is useful in terms of:

- Helps make connections that enable students to and explore new learning environments, overcoming distance and time barriers.
- Facilitating learning together with learning communication that can extend learning activities well beyond the classroom.
- assist in the creation of an environment that supports learning by offering resources that take into account individuals, cultures, or developmental differences.
- Improving opportunities for learning for students by offering virtual experiences and time-saving tools, enabling them to learn better.

The use of this video media, teachers must continue to guide the principles of the use of video media, among others are: 1) simplicity (simplicity), which is a media should be concise, simple and limited to things that are considered important; 2) unity (unity) is the relationship that exists among the elements of the media as a meaningful whole; 3) emphasis (emphasis), namely the existence of a particular idea or reason that the focus of attention on certain parts to attract interest and attention; 4) balance (balance) is the composition of media appearance that shows a harmonious situation, even the media that displays aspects of aesthetics / beauty.

In addition, in the implementation of learning, teachers must also keep guiding the principles of good teaching, namely: 1) learning curriculum learning tools, preparation of learning tools (syllabus and RPP, appropriate scenarios), as well as conducting learning in accordance with the condition of students; 2) using varied learning methods; 3) able to motivate students to actively learn; and 4) do the mastery of the class well.

Comparative class effectiveness test was conducted in different classes in the same school, that is class XI PH 2. Based on the results of research that has been done showed a significant increase in the activity and competence of students of class XI through learning by using tutor peer method.
Control class (comparison) that is implemented in class XI PH 2 with the number of children 22 students, who acted as a teacher is the researcher himself while the observer in the learning of two peers as observer 1 and observer 2. In the learning process implemented by using peer tutor by teaching the same subject in cycle III, namely tidying and cleaning the bathroom. Before the pre-test learning is done in advance to know the initial ability of students and after completion of the learning process is done practice and posttest purpose to know the level of success of students in the learning process. The data of the research results in the control / comparison class can be seen in the table below:

**Table 1. The test results graders control / comparator**

<table>
<thead>
<tr>
<th>Description</th>
<th>Analysis Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of students</td>
<td>22 students</td>
</tr>
<tr>
<td>Number of students taking the test</td>
<td>22 students</td>
</tr>
<tr>
<td>Number of students who complete the study</td>
<td>19 people</td>
</tr>
<tr>
<td>Number of students who have not finished studying</td>
<td>3 people</td>
</tr>
<tr>
<td>Average grade of students</td>
<td>78.64</td>
</tr>
<tr>
<td>Mastery learning classical</td>
<td>86.36%</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Completed in classical</td>
</tr>
</tbody>
</table>

Table 1 shows that based on the results of the tests in the control class / comparative class, after the learning process (learning process) then from 22 students after the test there are 19 students who experience complete mastery with a value of ≥ 70, while 3 students who have not experiencing complete learning, that is with a value of ≤ 70. The average result of the class control / class comparator that is equal to 78.64 with learning exhaustiveness classical learning process that is equal to 86.36%. So it can be concluded classically the learning process in the class of control / comparison with learning using peer tutor methods and video media has reached completeness, because a class is considered to be complete if 85% of students get the value of ≥ 70.

To analyze the results of research whether to experience a significant increase or not used t-test. In analyzing t-test required postes result between cycle II with control class / comparison class. Table 2 presents the t-test calculations between cycle III and the comparison class.

**Table 2. The test data t-test between the third cycle the comparator class**

<table>
<thead>
<tr>
<th></th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>21</td>
</tr>
<tr>
<td>MD</td>
<td>4.77</td>
</tr>
<tr>
<td>t</td>
<td>1.850</td>
</tr>
<tr>
<td>t&lt;sub&gt;table&lt;/sub&gt;</td>
<td>2.518</td>
</tr>
</tbody>
</table>

Result of t-test calculation at significance level 95% and degrees of freedom (db) = 21 obtained \( t_{\text{count}} = 1.850 \), and \( t_{\text{table}} = 2.518 \). Because \( t < t_{\text{table}} \) then the hypothesis is rejected. Means there is no difference in student's learning competence between cycle III with control class / class comparison on learning process applying peer tutor method.

Based on the results of the action and data analysis above, it can be stated that the supporting and inhibiting factors from the application of peer tutoring methods to the students' learning activities and skills are: the students have the ability, the spirit, and the high curiosity, the pleasure and interest of the students towards the learning process using peer tutor methods, students' willingness to listen to high enough students, conducive support from headmaster, good and...
harmonious cooperation between teacher and researcher, support and cooperation between parents with good school.

Then that becomes the obstacle factor from the implementation of peer tutor method, such as: with the teacher showing the video show the student does not pay attention to the note again about the subject matter when the student record the student can read back the note if one day the student forgot with the subject matter, for the teacher takes time long enough to prepare everything for the implementation of learning, as well as the process of implementation of learning using a long time.

4. Conclusion
Based on the results of Class Action Research (PTK) which has been described in the previous chapter, the conclusions of this study are as follows:

- Applying assure model based on peer tutor method can increase student learning activity.
- Applying assure model based on peer tutor method can improve students' skill in preparing guest room. In the implementation of learning, teachers should pay attention to matters: 1) in the implementation of teachers consistent with the lesson plan and learning scenarios; 2) apply varied learning methods; and 3) do the mastery of the class well.
- Supporting factors and inhibiting the application of assure model based on peer tutor method are students have high ability, passion, and curiosity, student's interest and interest in learning process, students willingness to listen high enough, support conducive from principal, good and harmonious cooperation between teacher and researcher, support and cooperation of parents with good enough school.
- Inhibiting factors from the implementation of peer tutor and video tutorial methods, such as: with the teacher showing the video show the students do not pay attention to the note again about the subject matter when the student record the student can read back the note if one day the student forgot with the subject matter, long enough in the implementation of learning.

References