



## ACTIVE LEARNING BASED ON BETTER TEACHING AND LEARNING (BTL) TO IMPROVE PROCESS SKILL AND STUDENTS STUDY RESULT

S. Sukaesih\*, K.K. Pukan

Biology Department, State University of Semarang, Indonesia

DOI: 10.15294/jpii.v4i1.3507

Accepted: 9 January 2015. Approved: 3 April 2015. Published: April 2015

### ABSTRACT

This research was conducted to describe the application of active learning based on Better Teaching and Learning (BTL) in improving process skill and students study result of grade VIII SMP N 21 Semarang. The method is classroom Action Research. The research result reviewed that the increase the process skill of students at cycle 1 and 2 are :80.95 and 94.29. While the students study result above passing grade at the cycles 1 and 2 are: 74.0 and 77.0. This result research that applying active learning Based on Better Teaching and Learning could increase the process skill and study result of the students.

© 2015 Science Education Study Program FMIPA UNNES Semarang

**Keywords:** Active learning; better teaching and learning; process skill; study result.

### INTRODUCTION

Strategy implemented in biology supposed to give flexibility and opportunities for students to conduct exploration through relevant programs, thus allowing students reconstruct their conceptual understanding. Teaching approach that encouraging students' skill, indirectly teaches students about learning how to learn. Thus, students will be trained to always strive to develop common sense and creativity within the framework of the development itself.

Result of interviews with teachers of Biology Class VIII SMP N 21 Semarang shows that we still found some constraints for learning activities. Problem encountered for teachers is the difficulty of motivating students to actively take a part in learning process. Only a small number (less than 40%) of students who want to actively involve in learning. The students are afraid or ashamed to ask and answer teacher's questions, there were small number students who is active in discussion and exploration. In addition, it is also

identified that students' practical science skill are not improving. Only certain students are actively involved, those who have an intermediate to high academic ability. science skill are not improving.

This less activation impacts on low study result of the students in the class VIII first semester 2011/2012. The average study results in Biology specially on topic of Locomotion System. Data of students result for academic year 2011/2012 on this topic indicates that students who achieve the value of the standard ( $\geq 80$ ) only 60%, so that student study result need to be improved.

Analysis of Biology teachers towards learning process nowadays describes teachers' effort in teaching still need to be maximized. The role of the teacher in the learning process is still more dominated. The teacher explained, still a lot of describing and to provide information about concept. Teachers are not get used into active learning strategies which may force students to be active in learning and developing the skills of the students. Practical science skill become important for the student. Practical skills development can occur due to application of learning approach that allows students to conduct a hands-on and

\*Correspondence Address:

Sekaran Campus, Gunungpati, Semarang 50229  
E-mail: sukaesih\_biounnes@yahoo.com

minds-on.

Process skills need to be developed with direct experience as a learning experience and realized when the activity takes place. This can make students more live and understand the processes that are going on and it does so it will have an impact on student learning outcomes. Learning is behavior change results obtained by the students after learning activities. The acquisition of these aspects of the behavior changes depending on what is learned by learners.

Active learning is highly recommended to be applied in teaching. Active learning is any form of learning that allows students to be active in the learning process, either in the form of interactions between students as well as students with teachers. According to Bonwell (1995), there are characters of Learning Process: (1) the emphasis is not on learning process of delivery of information by teachers but rather on the development of analytical and critical thinking skills to the topics or issues covered, (2) students not just listen passively but working on something relevant in the topic, (3) the emphasis on the exploration of values and attitudes to the material, (4) more students are required to think critically, analyze and evaluate, (5) that feedback will happen more quickly in the learning process.

In addition to these characteristics, in General according, a process of active learning allows getting a few things, there are: (a) interactions that arise during the process of learning will give rise to interdependent positively (positive interdependence) which consolidated the knowledge learned only can be obtained jointly through active exploration in learning, (b) every individual must be actively involved in the learning process and teacher should be able to get an assessment for each student so that there is individual accountability(c) the process of active learning so that it can run with effective cooperation level required is high so that it will foster social skills (social skills).

According to Decentralized Basic Education 3 (DBE3), active learning is also a goal in learning innovations. DBE3 is a program that aims to support the Ministry of National Education in improving the quality and relevance of education in Junior High School. DBE3 has developed packages for professional teaching and meaningful learning, called with a Better Teaching and Learning (BTL).

Better Teaching Learning creates a more meaningful learning experience by optimizing student learning. Active learning based BTL can be an alternative, which is expected to improve

the quality of the learning process. The application of active learning encourages students to use higher level thinking skills, utilizing a variety of learning resources, working in groups, making result work based on original idea, and displaying the work in the class as well as presenting it. Active learning provides learning more memorable, so more meaningful and useful. Unit educational materials Better Teaching and Learning are i.e. examine curriculum, drafting journal reflective; learning cooperative and displaying students masterpiece, make inquiries high levels and composing worksheet, develop media learning, and make judgments and composing rubrics. In this research, we will try to apply meaningful unit learning with an implement learning cooperative and displaying students' masterpiece, and using the journal reflection students.

Application of BTL in learning can optimize the quality of the learning process, and make students learning actively. According to Rusilowati (2011) reported that Better Teaching Learning model applied in learning science can develop the character of Junior High School students.

In classroom action research, active learning based on Better Teaching and Learning (BTL) will be implemented to improve practical skill and learning result grade VIII SMP N 21 Semarang. This research was conducted to describe the application of active learning based on Better Teaching and Learning (BTL) in improving practical skill and students study result of grade VIII SMP N 21 Semarang on Locomotion System material?

## METHOD

This Classroom Action Research will be held at Semarang SMP N 21 grade VIII in collaboration with one Science teacher of Semarang SMP N 21. The research will be implemented at the class which require special interest in learning process quality improvement. This Classroom Action Research will be held during the first semester of 2013/2014 from April to October 2013.

The factors observed during this research consist of: 1) Students' process skill subsequent to the learning process of Better Teaching and Learning model. In each research cycle, the students' process skill will be observed. The result of the observation is analysed to find out any students' process skill increase; 2) Study result of the student. There were measured by using a written test questions given at the end of each cycle. The

collected data will be explanatory analysed. The numeral data will be investigated and expressed based on the field note and as follows could be used to make conclusion.

The research will have cycles. Each cycle consist of 1-2 times of meeting by means of 4 phases; planing, action, observing, evaluation and reflection. When the first cycle could not attain the achievement indicator, the next cycle will be correctly established. This accomplishment will be preceding waiting for the achievement indicator attained.

The first phase is planning. During the preparation phase, the researcher (lecturer) and teacher will design learning scenario of the Science subje<sup>t</sup> by implementing beter teaching and learning model to increase students' process skill and result of study. **This first phase of the research cycle consists of:** 1) Maintaining primary observation concerning to the Semarang SMP N 21 Science learning by investigation and observation technique; 2) Maintaining discussion with the Semarang SMP N 21 Science teacher to talk about the problems and difficulties during the learning occasion by investigation and observation technique. **Research is done on Human topic**, in consideration quality processes to need improved; 3) Researcher (lecturer) constructing a cooperation with the teacher to establish any action that will be done to solve the obtained learning problems; 4) Composing learning devices of the research, such as lesson plan, worksheet, post test, observation sheets of students' process skill and teacher performance; 5) The obsevation sheet of students' process skill composed in an essay as the consideration of the students' process skill. This observation sheet is composed based. There will be 7 indicators of students' process skill: Observing, Collecting of data, Data analyzing, **Interpreting, Drawing conclusion, Comunicating, Showcase.**

In the planning stages, the researchers team that is a lecturer with the teacher researchers designing scenario the application of active learning based on better teaching and learning ( BTL ) on any material Locomotion System.

The second phase is action. This phase is data collecting phase which implementing better teaching and learning model to increase the students' process skill and students'study result. The actions of this phase are: 1) Researcher teacher maintain learning activity based on the preparation phase which implementing better teaching and learning model; 2) During the learning activity given by the teacher, the observer will observe the students' process skill and teacher

performance; 3) Based on the learning activity observation result, the researchers will maintain evaluation. The un-maximums learning activity concerning to the observation evaluation will be restored in the next meeting.

The third phase is observation. Based on the results of observation learning activities have been applied, a researcher with the teacher do the evaluation. The findings may still not optimally performed, need to get attention for a subsequent meeting. At the time the teacher researchers conduct studies, observations made by researchers,3lecturer and 1 student. Any observer doing the observation of the activities of the two groups, which taken from 8 groups. If the indicator is not reached on the implementation of each cycle, it will be continued in the next cycle.

The last phase is evaluation and reflection. The evaluation is maintained based on the result of observation. The un-maximums indicator observation result will be re-organized for the next meeting. The teacher reflects herself by studying the observation result. The teacher and observer learn the weak and potent of each indicator of this class action research to manage the next cycle. The auctioneer teacher will be given a chance to reveal her impression, consideration and experience during the learning process. The evaluation-reflection result of the cycle will become the next cycle concern to compose a better learning activity with better lesson plan and worksheet.

## RESULTS AND DISCUSSION

This research is a classroom action research conducted by applying cyclic active learning based on better teaching and learning. The research was conducted in two cycles to achieve the research indicator. The results of the study are presented in Table 1.

Based on the data in Table 1, it is known that the application of better teaching and learning affects students' process skills. It is seen that there is an increase in the average percentage of students' process skills in every cycle. In cycle 2, there is an increase of process skills in all seven indicators.

Process skills involve intellectual skills, manual, and social. Intellectual skills involved because his thinking ability students use when conducting a process of skills. Students may also use the tools and ingredients, measurements, and assembly tool as a manual skill of students at the time of process skills. Social skills is that at the time of process skills students also national interact with each other in carrying out teaching and

**Table 1.** Students' Process Skills in Two Cycle Research

No	Process Skills	Percentage (%) of process skills of Grade 8 d	
		Cycle 1	Cycle 2
1	Observation	96.0	100.0
2	Data collecting	89.0	92.0
3	Data analysis	83.0	93.0
4	Interpretation	83.0	96.0
5	Conclusion	67.0	93.0
6	Comunication	76.0	97.0
7	Showcase	73.0	88.0
Average		<b>80.95</b>	<b>94.29</b>

learning activities, such as discussion groups and presentations. Providing such life-oriented and relevant science education could help students become informed users and consumers of science knowledge who would be able to: ask, find or determine answers to questions derived from curiosity about everyday experiences; read with understanding articles about science in the popular press and to engage in social conversation about the validity of the conclusions; to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately; and make informed decisions about the environment and their own health and well being (Sarkar & Corrigan, 2012).

Based on the research results, it is known that the application of better teaching and learning model effects on improving the students' process skills. An increase in the percentage of average ability to think on every indicator occurs. In the second cycle, it is indicated that the seven proces skills have increased from the previous research cycles (cycles 1 ).In cycle 1, the average percentage of student's process skill is 80.95. This result indicates that student's process skill indicator has been reached, though the score in drawing conclusion aspect, communication aspect, and showcase aspect are still low. Students' learning motivation, which is still low in this cycle, gives some influences to those aspects, because motivation is a kind of driving force that makes someone is willing and able to do something. Kern and Carpenter in Simon *et al* (2008) found that while lower-order learning was similar between students in a traditional classroom setting and those in a field lab, students in the field lab exhibited increased levels of higher-order thinking over students in the classroom.

In this cycle, students are doing some experiments to know the elements which construct compact bone, to observe human skeleton, and to identify and to classify types of bones accor-

ding to their position, shape, and the elements which compose them. Students are divided into six groups. This activity has a purpose to improve students' scientific process skill, like observation, data collecting, data analyzing, interpretation, drawing conclusion, and communication. The results of this group work, that is student work sheets, are displayed in front of class so the other groups and the teacher can see the work sheets. It can be viewed as a set of skills to be learned by students and combined in the performance of a scientific investigation. It can also be viewed as a cognitive outcome that students are to achieve (Lederman, Allison and Stephen, 2012).

In cycle 2, the average percentage of student's process skill is 94.29. In this cycle, students do trans section observation of cartilage and compact bone tissue to identify the differences of their structures, trans section of smooth muscle, cardiac muscle, and skeleton muscle tissues to identify and to analyze the relation of each structure and its functions. This achievement is so satisfying that all of the aspects of student's process skill have been reached. The applying of learning design through discovery process makes students more motivated in identifying and classifying types of joints in human body by demonstrating this material together with teacher. In this cycle, students' works are also displayed in front of class like in cycle 1, but each group are given chances to see and to appreciate other students' works. They have to give their comments by writing their opinions down in the display boards. Biology as one of the areas of natural sciences which inquiring about nature systematically, so that Biology is not just as a collection of knowledge mastery of facts, concepts or principles, but also is a process of discovery.

Students' scientific process skills need to be developed with direct experience as a learning experience and realized when the activity takes place. This can make students more live and un-



derstand the processes that are going on and it does so it will have an impact on student learning outcomes. Learning is behavior change results obtained by the students after learning activities. The acquisition of these aspects of the behavior changes depending on what is learned by learners. Nwosu (referenced in Akinbobola and Afolabi, 2010) describes science as process skills competency and mental and physical abilities that serve as learning tools needed for effective natural science such as problem solving and the development of individual and social.

Students' learning result which is designated by Table 2 above indicates that there is an improvement of students' learning result from cycle 1 to cycle 2, but this improvement has not been yet in line with researcher's expectation, like has been mentioned in the performance indicators, that is 85% of the students pass the minimum score.

Reflection is done at the end of each cycle. The reflections of each cycle is used as a basis for the next cycle improvement. In general, the evalu-

ation of the treatment implementation is related to the classroom management to make it more effective.

Study result can be used as an indicator of the success of a process and learning methods. Based on study result, can also be known ability and development of learners after following the process of learning. Result study expected to demonstrate a change towards a better.

The average score of learning result that has been reached in cycle 1 is 74,0 and only 125 of the students passed the minimum score, that is 80. This result is being concerned and it shows that learning design that has been applied in this cycle has not been able to improve students' motivation to reach maximum learning result.

This reflection tells us that students, generally, are less focus to pay attention to the teacher during the learning process. The homework given by teacher has not been done at home. This problem indicates that students are not serious during the learning process. Intrinsically motivation has not been developed in their own self. Their atten-

**Table 2.** Students' Study Result in Two Cycle Research

No	Score	Percentage (%) distribution of study result of Grade 8 d	
		Cycle 1	Cycle 2
1	90 - 100	00.0	00.0
2	80 - 89	12.0	34.0
3	70 - 79	73.0	54.0
4	60 - 69	15.0	12.0
5	50 - 59	00.0	00.0
Average		<b>74.0</b>	<b>77.0</b>

**Table 3.** Results of Reflection on Each Cycle

Period	Reflection
Cycle 1	1. Students' learning motivation is still low, especially in doing their homework. They are not serious about completing the task set by the teacher.
	2. The students got too many work sheets, so they become less focused on doing task discussions and group works, and the impact of this problem is that their learning results are not as good as teacher's expectation.
	3. Classroom management needs to be further improved, particularly on students who are not yet active learning, especially on students who have delayed their homework.
	4. Students' works are just displayed and have not been yet appreciated to other groups because of the lack of time.
Cycle 2	1. Increase classroom management, including the improvement of learning process, to increase students' learning motivation in order to make them more responsible to every task given by teacher
	2. Giving some corrections on the lesson plan by adjusting the amount of student activities with the available time, so they will be more focus and more maximal in doing their tasks.
	3. Students' learning outcomes are presented in order to be appreciated and rewarded

dances are just basically daily activities and do not have influences in improvement of learning result quality. Therefore, the focus of the next learning process is how to improve students' motivation to make them more serious during the learning process.

The principle of motivation is one of the integral teaching principles. The use of motivation in learning process is not only to complete teaching procedure, but also to be the factor that determines the effective teaching. Motivation determines the level of success or failure in students' learning process. To learn without any motivation is so difficult to be done.

Moreover, according to the reflection the tasks that should be done by students in this cycle are too many and they are not adjusted with the available time allocation. This aspect gives influence to the students' learning result which has not been optimum. Designing a good teaching plan makes us easier to distribute the tasks, avoid congestion of the works and prevent stressed, and determine what kind of work that should be done and when to do it.

The average score in cycle 2 is better than the average score in cycle 1, that is 77,0. 34% of the students passed the minimum score. This achievement is satisfying, though the expectation of the researcher has not been reached. This result is like a synergy of evaluating result and the actions that have been done by the researchers in learning process, including the improvement of applying better teaching and learning program.

Cooperative learning based on BTL is one of the strategies for the realization of active learning, creative, effective and fun. Cooperative education provides an opportunity for students to interact each other, mutual understanding of a concept in describing his friend. Cooperative learning is one of the models that give the opportunity to students experiencing learning process which is very effective and can provide a much better learning results. Cooperative learning can also be used as a means to instill an inclusive attitude, i.e. an open attitude towards the various differences on fellow students in the school. Experience working with a friend who has a difference in terms of religion, tribe, achievement, gender, and others are expected to be able to make students appreciate the difference.

In cycle 2, some improvements have been done, for example, reduce the amount of student work sheet in line with the available time, so the students have enough time to do some learning activities as good as they can, and it influences on the increase of learning result. Another

improvement is to increase students' learning motivation by displaying students' works, and every group has chance to see and appreciate other students' works.

Better Teaching and Learning (BTL) developed by Decentralized Basic Education (DBE). Better Teaching Learning creates a more meaningful learning experience by optimizing student learning. Active learning based BTL can be an alternative, which is expected to improve the quality of the learning process. The application of active learning encourages students to use higher level thinking skills, utilizing a variety of learning resources, working in groups, making result work based on original idea, and displaying the work in the class as well as presenting it.

Unit educational materials Better Teaching and Learning are i.e. examine curriculum, drafting journal reflective; cooperative learning and displaying students masterpiece, make inquiries high levels and composing worksheet, develop media learning, and make judgments and composing rubrics. In this research, we applied meaningful unit learning with an implement learning cooperative and displaying students' masterpiece.

Learning through inquiry challenges students and enhances their attitude and learning in other ways as well (Lord & Orkwiszewski, 2006). In 1998, Paulson & Faust investigated about supporting active learning framework. The research results obtained that the supporting framework of the lecture (75% module + case study 25%), integrated with laboratory activities and improve the effectiveness of online learning courses with 5% significance. In the same year, Kumar (2005), researching on active learning approach with cooperative learning strategies are effective in the biological system.

## CONCLUSION

Based on the research results, some conclusions can be drawn as follows: The application of active learning based on better teaching and learning can increase the science process skills and study result of grade VIII students, SMP N 21 Semarang.

Suggestion is put forward as follows better teaching and learning is model of learning that provides opportunities for the students to inquire about something, by doing better teaching and learning the students can develop their process skills and study result. Thus, it is suggested that this learning model be applied to teach science and other materials.

## REFERENCES

- Akinbobola, A.O. dan Afolabi, F. 2010. Analysis of Science Process Skills in West African Senior Secondary School Certificate Physics Practical Examinations in Nigeria. *American-Eurasian Journal of Scientific Research*. 5 (4): 234-240.
- Bonwell, C.C. 1995. *Active Learning: Creating Excitement in the Classroom*. Report (Active learning workshop): Green Mountain Falls.
- Kumar, A. 2005. Teaching Systems Biology: An Active-learning Approach. *Journal of Cell Biol Educ*. 4 (4): 323–329.
- Lederman, N.G., Allison A., Stephen, B. 2012. Nature of Science, Scientific Inquiry, and Socio-Scientific Issues Arising from Genetics: A Pathway to Developing a Scientifically Literate Citizenry. *Journal Science and Education*. 23: 285-302.
- Lord, T. & Orkwiszewski, T. 2006. Didactic to Inquiry-Based Instruction. *J. The American Biology Teacher*. 68 (6): 341-350.
- Paulson, D.R., Faust, J.L. 1998. Active Learning in The College Classroom. *Journal on Excellent in College Teaching*. 9 (2): 3-24.
- Rusilowati, A. 2011. Pengembangan Model Better Teaching Learning untuk Mengembangkan Karakter Siswa SMP. *Laporan Hasil Penelitian*. Semarang: Unnes.
- Sarkar, M. & Corrigan. 2012. School science textbooks: A challenge for promoting scientific literacy in Bangladesh. In W. K. Chan (Ed.). *Journal Asia Pacific Education*. 154–168.
- Simon, M.E., Wu, X.B., Knight, S.L., Lopez, R.R. 2008. Assessing the Influence of Field- and GIS-based Inquiry on Student Attitude and Conceptual Knowledge in an Undergraduate Ecology Lab. *J.The American Society for Cell Biology*. 7 (2).