

TEXTBOOK EFFECTIVITY BASED ON ETHNOBIOLOGY OF BIODIVERSITY SUBJECT FOR STUDENT'S CRITICAL THINKING SKILL

Rizki Vera Vernanda and Fida Rachmadiarti
Department of Biology Universitas Negeri Surabaya, Surabaya, Indonesia
fidarachmadiarti@unesa.ac.id

Abstract— The purpose of this research was describing effectivity of textbook based on ethnobiology of biodiversity subject to train student's critical thinking skills. Textbook's effectivity obtained by study result test and student responses method. Study result test was using pre-test and post-test instruments. Improvement of students study result reviewed by Gain score test. While student responses obtained by spread of student responses questionnaire. The textbook that have been developed implemented to 20 students of X science 2 class in 1 SHS Lamongan. Textbook's effectivity based on students study result up to 85 of value average with complete category, while Gain score average up to 0,72 with high category. Students responses against ethnobiology textbook were 98,2% with very positive category.

Keywords— critical thinking, textbook, ethnobiology, biodiversity, effectivity.

INTRODUCTION

Curriculum of 2013 have been focused on some of competency which have to be owned by student include of attitude, knowledge and skills. The goals of this curriculum can be achieved if there is study source which suffice so that increase learning process effectively and efficiently. Textbook is one of study source that can be used in learning process. Text book has learning subject which arranged systematically that used by teacher and student into learning process.

Based on early observation that have been investigated, student was using textbook that have been bought and booked from school. In fact the textbook that have been used at school still informative and not integrated with the uses of another study source maximally, such as the uses of environment potency surround school and integration of local wisdom value.

Learning based on curriculum of 2013 well adapted if the study source that have been used from environment and people. Teacher is expected to explain the learning using local wisdom as study source. Learning based on local wisdom was supported by Education For Sustainable Development UNESCO (2016) which stated ESD has function to promote the learning that related to local wisdom and traditional knowledge also support the uses of main language in education.

Biology learning which can put local wisdom value at surround environment into learning subject which one of them using integrated of local wisdom value into textbook through ethnobiology study. Ethnobiology was study that combines inter study and multi to learn, documented and give value to traditional people of knowledge system in order to utilize natural resources at their surround environment. Biology learning using textbook based on ethnobiology will take more interest because student feels what they have learn in biology has related to the fact or local wisdom phenomenon in specific area. Besides that, the textbook is expected to train critical thinking skills of student because this subject related to any environment problems. Critical thinking skills was ability to think reflectively and skilled, so that declare an information and act which have to take as problem solving and reasoning.

Ethnobiology implementation can be learning through biodiversity subject. This thing caused by the wide scope in biodiversity subject. The object of biodiversity subject was an

organism which has a role in local wisdom that develops in their habitat and gives a place to introduce Indonesia natural resources for students.

Biodiversity is one of biology subject which learn by 10th grade class in SHS on first semester. The basic competency (BC) for biodiversity subject is BC 3.2 which is analyze the data of observation result about vary level of biodiversity (gene, species and ecosystem) in Indonesia also the threat and. Meanwhile BC 4.2 represent vary of observation result in biodiversity (genes, species and ecosystem) in Indonesia and preservation effort of Indonesia's biodiversity based on analyze result of preservation threat of animal and plant diversity in any kind of information media.

Learning of biodiversity at school environment was utilizing animal, plant and environment surround that school. The school which include of high biodiversity was stated as Adiwiyata school. One of Adiwiyata school was 1 SHS Lamongan which has supporting utility such as green house, school forest, ponds and school garden. There were found many of animal and plant biodiversity.

Investigation about the development of ethnoscience booklet with interaction between organisms theme was feasible as theory, which can be apply in learning process also train the science literacy learning of student. Another study about textbooks and its device development based on local wisdom on biodiversity subject, organisms classification, ecosystem and environment problem showed the textbook and its device was valid, practical and increase the knowledge about environment effectively also improve the good attitude of students in order to save the environment preservation. Meanwhile the other study about effectiveness of text book based on ethnobiology was not fully developed.

Effectiveness was a level which the organization achieves its goal. Definition of effectiveness generally shows how far the goal was determined. Effectivity was a measure which state how far the target completed, include of quantity, quality and time. The more big of target percentage that have been achieved, the more high its effectiveness.

Based on that background, the purpose of this study was describe the effectiveness of textbook based on ethnobiology of biodiversity subject to train critical thinking skills of student.

METHOD

This research was experimental study. The study took place at Department of Biology, Universitas Negeri Surabaya and 1 SHS Lamongan on September 2016-March 2017. Object of this study was the textbook based on ethnobiology of biodiversity subject to train critical thinking skills of X grade class student.

The development study of this textbook reviewed from effectiveness aspect. Textbook effectiveness gained by study result test method using study instrument of pretest and posttest sheets. The student was determined complete if they achieve the minimum completeness standard accord to their school for Biology subject was 75. The completeness students study result was determined complete if they could achieve 75% score with complete category.

RESULT

The effectiveness of textbook was reviewed through students study result and students responses on biodiversity subject. Table 3 was a recapitulation of completeness and achievement of students study result through ethnobiology textbook on biodiversity subject.

Table 3. Students Study Result using Textbook based on Biodiversity of Ethnobiology Subject

Students	Pretest	Note	Posttest	Note	Gain score	Criteria
1	50	Not complete	84	Complete	0,68	Intermediate
2	62	Not complete	92	Complete	0,79	High
3	66	Not complete	93	Complete	0,79	High
4	60	Not complete	96	Complete	0,90	High
5	48	Not complete	87	Complete	0,75	High
6	40	Not complete	73	Not complete	0,55	Intermediate
7	30	Not complete	83	Complete	0,76	High
8	45	Not complete	84	Complete	0,71	High
9	58	Not complete	85	Complete	0,64	Intermediate
10	43	Not complete	86	Complete	0,75	High
11	46	Not complete	88	Complete	0,78	High
12	34	Not complete	70	Not complete	0,55	Intermediate
13	45	Not complete	84	Complete	0,71	High
14	58	Not complete	93	Complete	0,83	High
15	62	Not complete	90	Complete	0,74	High
16	43	Not complete	78	Complete	0,61	Intermediate
17	42	Not complete	85	Complete	0,74	High
18	58	Not complete	88	Complete	0,71	High
19	44	Not complete	82	Complete	0,68	Intermediate
20	32	Not complete	83	Complete	0,75	High
Average	48	Not complete	85	Complete	0,72	High

Based on Table 3 were explained that the students before using ethnobiology textbook their score were 75 accord to minimum completeness criteria its school. Meanwhile, average value of students after using ethnobiology textbook were higher than 75.

Gain score was utilizes to investigate the achievement of students study result before and after using ethnobiology textbook. Total of 14 students obtained high level Gain score, while 6 others with intermediate level of Gain score. Average value of Gain score up to 0,72 with high category.

Students study result also has function to explain the achievement of indicator. Based on the result, average value of indicator which have been achieved up to 86%. Average of high indicator achievement on 1 indicator tell the definition of biodiversity with the score 97,5%. Low average indicator achievements were found at 6 indicators in order to analyze the effort of biodiversity preservation with the score 80% (Picture 1).

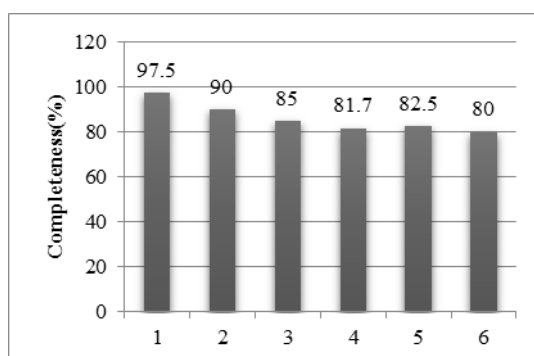


Fig. 1. Completeness each of indicator, Indicator 1=explain the definition of biodiversity. Indicator 2= explain the definition of biodiversity at level of genes, species and ecosystem. Indicator 3= identify the biodiversity level. Indicator 4= identify Indonesia biodiversity. Indicator 5= Identify the utility of biodiversity. Indicator 6= analyze the effort of biodiversity preservation.

Textbook effectivity was also reviewed from student's responses. Student's responses were student's reaction against learning process using the textbook. Student's responses were obtained by spread the questionnaire after the learning. Recapitulation of student's responses questionnaire against textbook were examined on Table 4.

Table 4. Recapitulation of Students Responses against Textbook based on Biodiversity of Ethnobiology Subject

Nu	Value of Aspect	Feasibility Percentage in Component (%)	Percentage average of each aspect (%) and category
A. Criteria of Component Presentation			
1.	Textbook support student's center learning	100%	99,4% (Very positive)
2.	Textbook make the students to study in group	100%	
3.	Ethnobiology textbook attract the student's interest to study	100%	
4.	Ethnobiology column in this textbook guide the student to understand the biodiversity concept	100%	
5.	Some activities related to ethnobiology give a new insight for the students	100%	

Nu	Value of Aspect	Feasibility Percentage in Component (%)	Percentage average of each aspect (%) and category
6.	Textbook enhance the ethnobiology knowledge at student's area and its surround	100%	
7.	Textbook link the biota, environment and traditional people.	100%	
8.	Textbook maintain new information about local species, local culture, and local technology	100%	
9.	Textbook is capable to develop student's thinking process	100%	
10.	Textbook build the student's knowledge	100%	
11.	Textbook help the students to understand the concept	100%	
12.	The questions inside textbook can qualify the student's understanding	100%	
13.	Textbook build the student's curiosity	100%	
14.	Textbook trigger the students to analyze an information	100%	
15.	Textbook trigger the students to solve a problem	95%	
16.	Textbook trigger the students to observe, inference and evaluate	95%	
B. Criteria of Physic Component			
17.	The layout of textbook was attractive	100%	97% (Very positive)
18.	The way of explanation attract the student's interest and attention	100%	
19.	Features inside the textbook was attractive	100%	
20.	Illustrations (picture and table) inside textbook support the student to understand the biodiversity subject	85%	
21.	The letter inside textbook was ease to read	100%	
C. Kriteria Bahasa			
22.	The language that have been used were ease to understand	100%	98,3% (Very positive)
23.	The sentences were ease to understand	100%	
24.	The scientific names inside textbook were ease to understand	95%	
Average			98,2% (Very positive)

Based on Table 4 were explained that most of students have positive responses against textbook. The questions on its questionnaire determined by 3 criteria which criteria of content presentation, physic presentation and language presentation.

There were 16 questions at content presentation, two questions were gained 95% responses which the questions asked the problem solving of textbook, observation, inference and evaluation so that the yes answer percentage on its content up to 99,4%.

There were 5 questions which respectively gained 100% responses, except the question about illustration (picture and table) inside textbook that gained 85%, so that the average from physic presentation were 97%.

There were 3 questions of language criteria which obtained 100% responses, except the question about the name that ease to understand in textbook which gained 95%, so that the average of language criteria up to 98,3%

CONCLUSION

Based on this study result, it concluded that ethnobiology textbook of biodiversity subject has been proven to train critical thinking skills of students, also effective based on students study result which the average value 85 with complete category meanwhile the average value of Gain score was 0,72 with high category also students responses result with very positive category.

REFERENCES

- P. Paulina and Purwanto, Teaching Materials Writing. Jakarta, University Centre of Achievement and Development of Dinas Dikti Diten Activity, 2001.
- Rosyidah, dkk, "Development of science module based on additive ethnoscience in food material for VIII class of 1 Junior High School Pegandon Kenda,". Unnes Science Education Journal. 2013, Accessed on <http://journal.unnes.ac.id/sju/index.php/usej> on 15 March 2017.
- Oktaviani, D, "Ethnozoology, Reproduction Biology, and Preservation of Lema Fish *Rastreliliger kanagurta* (Cuvier, 1816) at Mayalibit Bay, District of Raja Ampat West Papua Indonesia", Disertation, Depok, 2013.
- K. Siu Cheung, "An experience of a three-year study on the development of critical thinking skills in flipped secondary classrooms with pedagogical and technological support", *Science Direct*, 2015.
- Aprilia, et al, The development of ethnoscience booklet with interaction between organism's themes. *Bio Edu Journal*, 2015. ISSN : 2302-9528 Accessed on <http://ejournal.unesa.ac.id> on 15 March 2017.
- Ardan, A,S, "The development of biology teaching material based on the local wisdom of timorese to improve students knowledge and attitude of environment in caring the persevation of environment", *International Journal of Higher Education*, vol. 5, Num. 3, 2016.
- Lailatul, F, "The utility of student textbook to increase islam education learning's effectivity on VII Class of 3 Junior High School Malang", Final project of Bachelor Universitas Islam Negeri (UIN) Maulana Malik Ibrahim, Malang, 2010. Accessed on 1 January 2017.
- Danfar, "Definition/ Effectivity's Meaning", 2009. Accessed on <http://dansite.wordpress.com/2009/03/28/pengertian-efektifitas/> on 7 January 2017.
- Riduwan, Measurement Scale of The Research's Variables. Bandung: Alfabeta, 2013.
- Riduwan, Measurement Scale of The Research's Variables. Bandung: Alfabeta, 2010.

- Nursalim, M, "*Education's Psychology*", Surabaya: Unesa University Press, 2007.
- BSNP, "Academic Manuscript of Instrument Assessment's Textbook for Basic and Intermediate Education". Jakarta: Education National Standard, 2014.
- A. Samsul and Kusrianto, "Success in Textbook's and Reference's Writing". Jakarta: Grasindo, 2009.
- L. W. Anderson and K. Krathwool, "A taxonomy for learning, teaching and assessing: A revision of Bloom's Taxonomy, USA: Mc Hill, 2001.
- A, Riski, 2017, "Effect of talented student's motivation against their capability of mathematic problem solving", 2017, JPPM, vol. 10 Num. 1.
- S. Nuri, M. Yuke, S. Ahmad, "Learning model effect of advance organizer against student's biology study result on protist concept", Edusains, 2015. Accessed on <http://journal.uinjkt.ac.id/index.php/edusains> on 02 March 2017.
- N. Nienke "Design Approaches and Tools in Education and Training" In collaboration with Interuniversitair Centrum voor Onderzoek (ICO): Springer Science+Bussines Media, B.V, 1999.