Improving Learning Outcomes with an Ethnoscience-Based Contextual Approach

by Fery Hermanto

Submission date: 17-Mar-2021 06:46PM (UTC-0700)
Submission ID: 1535793083
File name: 5._Hermanto_45-51.pdf (329.48K)
Word count: 2947
Character count: 17342

Science Education and Application Journal (SEAJ)
Program Studi Pendidikan IPA
Universitas Islam Lamongan
http://jurnalpendidikan.unisla.ac.id/index.php/SEAJ

March, 2021. Vol.3, No, 1
p-ISSN: 2656-6672
e-ISSN: 2656-8365
pp. 45-51

Improving Learning Outcomes with an Ethnoscience-Based Contextual Approach

[1]Fery Hermanto
[1]Independent researcher
Email Correspondence: fhermanto26@gmail.com

Article Info
Article History
Received: 25 January 2021
Revised: 09 February 2021
Published: 25 March 2021
Keywords
Learning Outcomes, Contextual Learning, Ethno-Science, Classification of Living Things.

Abstract

The objective research purposed to analyze improvement of student learning outcomes using the Ethno science-based Contextual Learning Approach in the classification of living things. Research type one group pretest and posttest design. The research subjects were 36 students of class VII-A SMP Negeri 1 Maba, East Halmahera. The result showed that 1) Learning outcomes improved significance, 2) feasibility of instruction good category, and 3) he response of student's positively. It could be concluded that the learning procces effective to improved student's learning achievement.

Citations: Hermanto, Fery. (2021). Improving Learning Outcomes with an Ethnoscience-Based Contextual Approach. *Science Education and Application Journal*. 3(1) 45-51

INTRODUCTION

Science learning always related to how to teach science or science. Science consists of a body of knowledge, a way of thinking, and a way of investigating (Chiappetta & Kobala, 2010). A body of scientific knowledge consists of concepts, facts, or laws which are authentic and empirical scientific products of scientists. A way of scientific thinking is the scientific thinking skills and attitudes that are required from the process of learning science. A way of investigating science, namely the scientific process skills that are carried out in the entire investigative process in drawing conclusions from a scientific phenomenon. The three components of science are then described sequentially as products, attitudes, and scientific processes (Wijiyono, 2010). This narrative means that science learning is highly correlated with learning that can facilitate integrated scientific products, attitudes, and processes.

Learning that can facilitate the science component above is usually in the form of Hands-on and Minds-on Learning emphasis (Kun, 2013). Learning like this is complex (tends to be difficult) and demands special modeling in learning applications. This opinion is corroborated by the results of observations in 4 junior high schools in East Halmahera Regency as follows: 1) 80% of student respondents stated that science learning is classified as difficult to understand; 2) 72% of respondents stated that the learning experience in science subjects took place in the same direction (dominant teacher, text book, and lack of experimental practice); 3) Teachers who teach science subjects have difficulty preparing science learning tools that can improve science learning, especially in the material classification of living things; 4) The teacher argues, students who learn contextually tend to get better learning outcomes than using media such as those in books; and 5) 86% of student respondents agree that they will better understand the learning content if taught with media or approaches that exist in their

own environment. Based on these findings, researchers found the importance of contextual aspects of learning in the learning process.

The contextual approach (Contextual Teaching and Learning) is a learning concept that helps teachers connect the material they teach with students' real-world situations and encourages students to make connections between their knowledge and its application in their lives as family and community members (Nurhadi, 2002). Learning can be said to be a contextual approach if it applies the seven components of contextual learning, namely (1) constructivism, (2) inquiry, (3) questioning, (4) learning society, (5) modeling, (6) reflection and (7) assessment which are actually. Research shows that contextual-based learning will be more effective if it uses an ethnoscience-based approach (Amanah, 2018; Kun, 2013; Novitasari, Astya, & Faizal, 2017; Rahmi & Rosdiana, 2018).

Ethnoscience is a community belief in certain areas whose truth can be studied scientifically (Mahendrani, K. & Sudarmin, 2015). Beliefs, methods, naming objects, assumptions, and methods in society can be included in learning with the aim of facilitating the naming and understanding of concepts that students accept. This is important to apply, especially to materials that require memorization, classification, classification, and interpretation. Indicators like this are very common in science learning. Through the ethnoscience approach, it is hoped that everything students understand and do in life can be applied in improving learning outcomes.

Jegede (2014), Rosdiana (2018) and Okebula (2014) state that student learning outcomes can be improved by combining indigenous science with science learning in a formal school environment. Amanah (2018) emphasizes that the process of introducing science through ethnoscience can facilitate learning, considering that a process of integrating science will emerge. The collaborative process between original science and science in schools can bridge students to understand science better, one of which is proven by increasing student learning outcomes in cognitive, psychomotor, or affective aspects (Amanah, 2018; Khaerudin, 2015; Sofiah, 2018;). Based on the description above, with the use of ethnoscience-based contextual learning, students are expected to be able to construct science concepts by facilitating understanding of the culture that is developing in their area to improve student learning outcomes.

METHODS

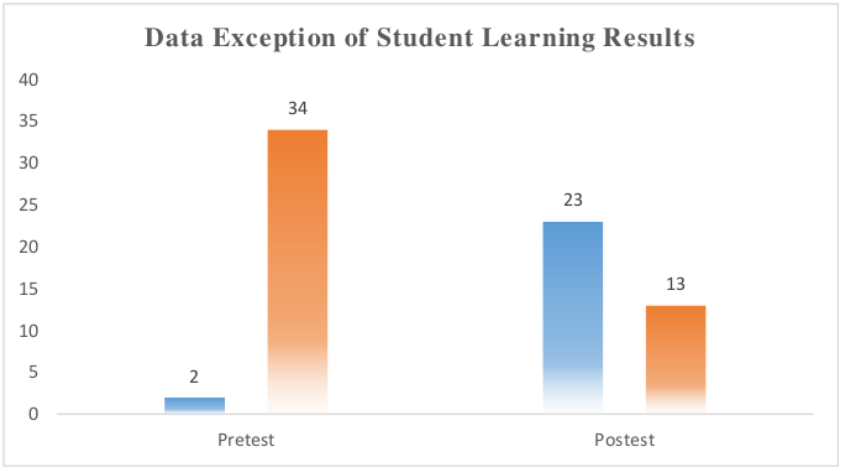
The method used was the one group pre-test and post-test design research model. The target in the study was 36 students of class VII SMPN 1 Maba with a proportion of 20 male and 16 female students. Subjects are from the freshmen and immigrant tribes such as Bugis or Toraja. The research instruments used were in the form of test sheets, observations, and questionnaires. This test sheet includes the students' pre-test and post-test sheets. The observation sheet is the observation sheet for the implementation of learning. Questionnaire sheet containing student response questionnaires. The results of the students' pre-test and post-test were analyzed for significance using the t-test to show the significance of an increase in learning outcomes. The results of the implementation of learning come from the percentage of observations on learning. The results of the student response questionnaire came from the percentage of student responses after learning was complete.

RESULTS AND DISCUSSION

A. Learning Outcomes

The analysis of the significance of the increase in learning outcomes was carried out by comparing two test results, namely the pre-test and post-test. The two tests were characterized by being identical on the basis of indicators and KD, but different from the aspects of the form and number of questions. The pre-test was given before the treatment, and the post-test was given after the learning took place. Students are declared complete if

they get a minimum score of 65 according to the applicable KKM. The test results are illustrated in the following graph.



Graph 1. Data on Student Learning Outcomes Completeness

The graph above indicates that there has been a change in the shape of the bar chart from the Pretest graph to the Posttest chart. The pre-test results showed that 5.5% of students completed, and the remaining 94.5% did not. After the learning was carried out, and the posttest was carried out, the data changed (we can see according to the graph 1 on the right), 63.8% of students who completed and the remaining 36.2% did not complete. This data supports the opinion of Dahar (2011) which states that learning that facilitates independence and is in accordance with what is experienced by children in real life can help construct knowledge. Knowledge (concepts) in contextual science learning on the basis of ethnoscience certainly makes it easier for students to learn to imagine the forms, names, concepts, or flows contained in that knowledge. Furthermore, the data from the graph above was tested for the significance level of changes in the learning outcome data then analyzed using the two-party t-test, with the following results

Table 1. *The results of the t-test analysis of pretest and posttest data*

	Ttable	TCount
n = 36; α=0.05	1.6977	1.9944

Based on Table 1 above, the results of the analysis state that with a sample size of 36 students at the significance level (α) 0.05 it was obtained (TCount (1, 9944)> T table (1, 6977) so that it can be concluded that learning with an ethnoscience-based contextual approach can be significantly improve learning outcomes

B. Learning Implementation

The implementation of learning refers to the level of implementation of the lesson plan which is a reference for learning activities. The results of the implementation of learning were observed by two observers who were carried out for 3 meetings with a time allocation of 8 x 40 minutes with details of the first meeting as much as 3 x 40 minutes (120 minutes),

the second meeting 2 x 40 minutes (80 minutes), and the third meeting 3 x 40 minutes (120 minutes). The full implementation results can be seen in Table 2 below:

Table 2. *The result of the percentage of learning implementation*

Meeting	Reliability
1	90%
2	92.5%
3	89%

The implementation of learning gets good reliability, because at each meeting, students carry out activities according to the inquiry learning phase with a contextual approach based on ethnoscience that is carried out. The implementation of this learning is also in accordance with the statement of Kuhlthau (2006), which explains that inquiry with a contextual approach has six characteristics that must be fulfilled, namely:

1. Students learn actively and can reflect on experiences in learning.
2. Students learn by building on the knowledge they already know.
3. Students develop higher order thinking processes through guidance in the learning process.
4. Students develop gradually.
5. Students have a different way of learning.
6. Students learn through social interaction with others.

The implementation of all phases of the learning model is important for the fulfillment of the objectives to be achieved because if the required characteristics have been achieved, the effectiveness of the learning model used will emerge. Brickman (2009) states that inquiry science learning with a contextual approach is effective in measuring the achievement of learning outcomes in understanding knowledge, understanding concepts, and overcoming misconceptions of knowledge understanding. The recognition of effectiveness is also expressed by Bilgin (2009) that activities in contextual-based inquiry learning help students develop individual responses, cognitive abilities, report making, problem solving, and process skills. This opinion makes it clear that the applied learning model can improve concept understanding, creativity spirit, independent learning, tolerance for different opinions, and increased understanding of students' concepts, based on the results, discussion, and analysis of conformity with existing theories, it can be said that the device learning that has been applied can improve student learning outcomes.

C. Student Responses

Student response data to guided learning is measured by distributing questionnaires to students. The results of student responses obtained are in accordance with Table 3 below.

No.	Interest Part	Percentage (%)
1	Interest	86
2	Feels New	90
3	Easy to follow	92
4	Learning continuity	86
5	Learning Implementation	86
6	Evaluation	92
	Average	86

The results of the student responses above indicate that the learning process that has been followed can be said to be student-centered. Gagne (1988), states that learning is a bridge or process that facilitates / helps students to learn / teach students. Gagne's (1988) statement

is in accordance with the constructivist view of learning, namely learning that teaches students, which emphasizes active student participation, and places / positions the teacher as a facilitator (Westwood, 2008). This is also corroborated by the opinion of Nur (2008) which states that constructivists view that in learning students actively construct knowledge, students' minds mediate input from the environment, then determine what they will learn. As a form of constructivism view, in this study the teacher facilitates students to learn by providing worksheets as a guide for measuring / observing or experimenting, and conducting discussions. Students are given the opportunity to interact with the material they are learning through observation or practicum, discussion, and provide opportunities for students to think about the results of observations or practicum, and the results of the discussion, so that through these activities, students are expected to improve learning outcomes from the material that has been studied.

CONCLUSION

The application of contextual learning based on ethnoscience has been shown to significantly improve student learning outcomes in the classification of living things.

SUGGESTION (12pt)

1. Researchers suggest, before learning. Researchers must understand the cultural characteristics of the research subjects. The more heterogeneous, the more complex the ethnoscience values will appear.
2. It takes a subject bigger than the number scale to strengthen the conclusion.

REFERENCES

Aikenhead. (2002). *Renegotition The Culture of Science In Improving Science Education : The Contribution of Research*. Toronto: Open University Press.

Alberta. (2004). *Focus on Inquiry A Teacher Guide to Implementing Inquiry Based Learning*. Canada: Alberta Learning Centre.

Amanah. (2018). Validitas dan Kepraktisan Buku Ajar IPA SMP Berbasis Etnosains untuk Meningkatkan Keterampilan Klasifikasi Siswa SMP. *E-journal UNESA*, 108 -113.

Anderson, L.W., dan Krathwohl, D.R. (2001). A taxonomoy for Learning, Teaching, and Assesing; A Revision of Bloom's Taxonomy of Education Objectives. New York: Addison Wesley Lonman Inc

Annafi. (2018).). Pengembangan model pembelajaran Project Based Learning (PBL) Berbasis kearifan lokal untuk mempersiapkan calon pendidik yang berbudaya. *Jurnal QUANTUM*, 1 - 10.

Arikunto. (1993). *Prosedur Penelitian: Suatu Pendekatan Praktik*. Jakarta: Rineka Cipta.

Arlianovita. (2015). Pendekatan etnosains dalam proses pembuatan tempe terhadap kemampuan literasi sains. *Seminar Fisika dan Sains Universitas Negeri Malang* (hal. 2 - 15). Malang: UM Press.

Arsyad, A. (2002). *Media pembelajaran*. Jakarta: Grafindo Persada.

Ausubel, D. P. (1960). The Use of Advanced Organizers in the Learning and Retention of Meaningfull Verbal Material. Journal of Educational Psychology, 51: 267—272.

Benarjee. A. (2010). Teaching Science Using Guided Inquiry as the Central Theme: A Professional Development Model for High School. *The National Science Education Leadership Association Journal*. Vol. 19 (2), pp. 1—9.

Bilgin, Ibrahim. (2009). The effects of guided inquiry instruction incorporating a cooperative learning approach on university students' achievement of acid and bases concepts and attitude toward guided inquiry instruction. S*cientific Research and Essay* Vol.4 (10), pp. 1038—1046

Bloom, B. S. (1956). *Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook 1: The Cognitive Domain*. New York: Longman.

Borich, D. (1994*). Observation Skill for Effective Teaching*. New York: Macmilan Publishing Company.

Brickmann, P. (2009). Effects of Inquiry-based Learning on Students' Science Literacy Skills and Confidence. International Journal for the Scholarship of Teaching and Learning. Vol. 02. (03). Hal. 7—22.

Dahar, R. W. (2011). *Teori Belajar dan Pembelajaran*. Jakarta: Penerbit Erlangga.

Kemendikbud. (2016). *Permendikbud Nomor 22 Tahun 2016 tentang Standar Proses Pendidikan Dasar dan Menengah*. Jakarta.

Khaeruddin, A. (2015). Penggunaan Media Pembelajaran Komik Sains Berbasis Kontekstual Pada Konsep Sistem Ekskresi Pada Manusia Untuk Meningkatkan Keterampilan Berpikir Kritis Siswa Kelas Xi Sman 1 Losari. *Jurnal Pendidikan IAIN Cirebon*, 24 - 31.

Khaerudin, A. (2015). *enggunaan Media Pembelajaran Komik Sains Berbasis Kontekstual Pada Konsep Sistem Ekskresi Pada Manusia Untuk Meningkatkan Keterampilan Berpikir Kritis Siswa Kelas Xi Sman 1 Losari*. Cirebon: Fakultas Tarbiyah IAIN Cirebon.

Septaria, K. (2019). Mengeksplorasi Argumentasi dan Pengetahuan Pendidik Ilmu Pengetahuan Alam (IPA) Tentang Pemanasan Global [Exploring the Arguments and Knowledge of Natural Sciences (IPA) Educators on Global Warming]. *PEDAGOGIA: Jurnal Pendidikan*, 8(2), 247-256.

Kuhlthau, C. C. (2006). *Guided Inquiry Learning In The 21st Century*. Westport, CT: Libraries Unlimited Publishing Company.

Kuhlthau, C.C., & R.J, Todd. (2008). Guided Inquiry. (Online). http://www.icwc.wikispaces.com/file/view/Guided+Inquiry.doc. Diakses 13 Desember 2015

Maryanto, K. (2013). *Kearifan Lokal dan Lingkungan*. Jakarta: Kemendikbud.

Rahayu. (2015). Pengembangan Modul IPA Terpadu Berbasis Etnosains Tema Energi dalam Kehidupan untuk Menanamkan Jiwa Konservasi Siswa. *UNNES Science Education Journal*, 920 - 926.

Rosdiana, L. (2018). Peningkatan Hasil Belajar dengan Menggunakan Media Science Story Berbasis Etnosains. *E-journal UNESA*, 108 - 113.

Rosyidah, & Sudarmin. (2013). Pengembangan Modul IPA Berbasis Etnosains Zat Aditif dalam Bahan Makanan untuk Kelas VIII SMP Negeri 1 Pegandon Kendal. *UNNES education Journal*, 133 - 139.

Sofiah, U. (2018). Pengembangan Media Pembelajaran Kontekstual Menggunakan Komik Fisika untuk Peserta Didik SMP. *Jurnal Pendidikan Universitas Ahmad Dahlan*, 32-38.

Sugiyono. (2012). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.

Sugiyono. (2014). *Metode Penelitian Kuantitatif Kualitatif dan R&D Edisi ke-2*. Bandung: Alfabeta.

Sumargiyani. (206). Penerapan Pembelajaran Kontekstual Pada Pembahasan Volume Benda Putar Dengan Pembelajaran Kontekstual. *Seminar Nasional Matmatika 2006* (hal. 112 - 119). Jogjakarta: UNY Publisher.

Walpole, R.E. (1993). *Pengantar Statistika. Edisi Ketiga (Edsisi Terjemahan)*. Jakarta: PT Gramedia Pustaka Utama.

Wenning, C. J. (2011). The Level Inquiry Model of Science Teaching. *Journal Physic Education* 6(2): 9—16.

Westwood, P. (2008). *What Teachers Need to Know about Teaching Methods*? Victoria: ACER Press.

Yanto, A. (2017). Peningkatan motivasi belajar siswa materi sifat-sifat cahaya dan manfaatnya pada mata pelajaran ipa dengan menggunakan pendekatan metode keterampilan proses dan implikasinya terhadap hasil belajar yang dicapai siswa kelas V di SD Negeri Cigasong . *Jurnal Cakrawala Pendas*, 54 - 67.

Improving Learning Outcomes with an Ethnoscience-Based Contextual Approach

ORIGINALITY REPORT

16%	8%	11%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	G Y Arygunartha, Y P Situmeang. "Application of the contextual teaching and learning model as an efforts to improve student results and scientific performance of student physics", Journal of Physics: Conference Series, 2019 Publication	2%
2	Y L Rahmi, E Novriyanti, A Ardi, R Rifandi. "Developing Guided Inquiry-Based Student Lab Worksheet for Laboratory Knowledge Course", IOP Conference Series: Materials Science and Engineering, 2018 Publication	2%
3	Submitted to Universitas Negeri Semarang Student Paper	2%
4	repository.radenintan.ac.id Internet Source	1%
5	E Nurvitasari, R Z Maarebia, N B Sumanik. "The effectiveness of applying contextual approach based on environment toward chemistry	1%

learning achievement and scientific attitude", IOP Conference Series: Earth and Environmental Science, 2019
Publication

6	A F Syadzili, Soetjipto, Tukiran. "Guided Inquiry with Cognitive Conflict Strategy: Drilling Indonesian High School Students' Creative Thinking Skills", Journal of Physics: Conference Series, 2018 Publication	1%
7	A M Fauziah, T Nurita. "Activities of students in using worksheet based on Contextual Teaching and Learning", Journal of Physics: Conference Series, 2019 Publication	1%
8	Rusi Rusmiati Aliyyah, Dwika Resti Ayuntina, Endang Sri Budi Herawati, Muhamad Suhardi, Ismail. "USING OF CONTEXTUAL TEACHING AND LEARNING MODELS TO IMPROVE STUDENTS NATURAL SCIENCE LEARNING OUTCOMES", Indonesian Journal of Applied Research (IJAR), 2020 Publication	1%
9	sains.fmipa.unesa.ac.id Internet Source	1%
10	sevgiligiyim.com Internet Source	1%

11	Submitted to University of Houston System Student Paper	1%
12	bircu-journal.com Internet Source	<1%
13	www.academicjournals.org Internet Source	<1%
14	Duccio Rocchini. "Ecological Remote Sensing: A Challenging Section on Ecological Theory and Remote Sensing", Remote Sensing, 2021 Publication	<1%
15	Y Sunaryo, A T Fatimah. "Contextual approach with scaffolding: an effort to improve student's mathematical critical thinking", Journal of Physics: Conference Series, 2020 Publication	<1%
16	Proceeding of LPPM UPN "Veteran" Yogyakarta Conference Series 2020 – Engineering and Science Series, 2020 Publication	<1%
17	files.eric.ed.gov Internet Source	<1%
18	portal.issn.org Internet Source	<1%
19	Iryani, Z Fitriza, Iswendi, Bayharti, W Yunisa, P Ifelicia. "Development of buffer solution module	<1%

based on guided inquiry and multiple representations", Journal of Physics: Conference Series, 2019
Publication

20	N Maryani, D B Widjajanti. "Mathematical literacy: How to improve it using contextual teaching and learning method?", Journal of Physics: Conference Series, 2020 Publication	<1%
21	Neny Endriana, Rody Satriawan, Tuti Alawiah. "Model Development Project Based Learning To Improve Mathematical Reasoning and Motivation", Journal of Physics: Conference Series, 2020 Publication	<1%

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	Off		