

Etse-Module "The Benefits of Acidic Bases in Life" Ethnoscience Based Demak Society in the Utilisation of Lime

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Abstract: *Teaching materials delivered by a teacher should be able to instil the character education of students through the culture and local wisdom that is around students who are integrated with the concepts that will be learned so that students can think scientifically about the phenomena they encounter every day. One way to incorporate local wisdom-based learning through the creation of ethnoscience-based modules. EtsE-Module it is an electronic module based on ethnoscience in Demak, a city in Central Java Indonesia which utilises lime as acne medicine on the acid-base material of Grade VII students in the first semester. Based on the results of the reconstruction of the science, the preparation of teaching materials can be loaded on the subject of science secondary school on the subject of acid and base. Students can discuss the process occurring in the phenomenon as well as inquire process on the topic according to the lesson plan that has been made by the teacher. The development of Ets-E-module is an electronic module based on local wisdom as the handling of junior high school students in studying IPA phenomena in the community.*

Keywords: Teaching materials, Ethnoscience, acid-base topic, Etse-Module

1. Introduction

Education is a measure of the success of a nation because the quality of the nation is determined by the quality of education in the country. Trends in the International Mathematics and Science Study (TIMSS) is a study comparing mathematics and science achievement rates in various countries following it in 2015, the results in Indonesian science are ranked 45 out of 48 participants with below-average scores 397 [1]. In addition, a survey conducted by the Program for International Student Assessment (PISA), which is a study of science literacy students in various countries in the world in 2016 reported the results of science literacy students in Indonesia who ranked the bottom 10 of all countries in the world that follow PISA with a score of 403 [2]. Based on the scores obtained by Indonesian students only have the ability of science literacy to remember scientific knowledge such as facts, scientific names, simple formulas and scientific terms and evaluate an event, recognize the basic concept and have not been able to apply the concept in everyday life [3], [4].

The low level of student learning in Indonesia is caused by several factors. Some of these factors are the solid curriculum, the material on textbooks that are thought too difficult to understand, less effective learning media, inadequate laboratories, less precisely the use of learning media selected by teachers, less optimal and lack of student alignment itself, conventional nature, which makes students less involved in the learning process and the liveliness of the class is mostly dominated by the teacher [5]. Curriculum 2013 seeks to improve the quality of education in Indonesia in Regulation of Education and Cultural Minister Number 65 Year 2013 on Standards The process described that the learning process in the educational unit held interactively, inspirational, fun, challenging, motivate learners, to participate actively, Enough for initiative, creativity, and independence in accordance with the talents, interests, and

physical and psychological development of learners. The change of learning into Curriculum 2013 according to [6] seven principles namely 1) learners who are told to be learners to find out; 2) the teacher as a learning resource to learn from various learning sources; 3) learning that emphasizes a single answer into multidimensional learning; 4) learning of verbalism toward learning that improves applicative skills; 5) improvement and balance between physical skills and mental skills; 6) learning takes place anywhere, including at school, at home, as well as in the community; 7) learning that apply Ki Hajar Dewantara's values *ing ngarso sung tulodho* (teacher should be model for students), *ing madyo mangun karsa* (in the middle teacher participate to helps students), and *tut wuri handayani* (from behind teacher should gives encouragement). Another factor besides the curriculum that becomes the basic problem in the improvement of education is the material in the textbook that students feel is too difficult because the material taught is not associated with the daily life of the students and it is still general.

Teaching materials delivered by a teacher should be able to instil the character education of students through the culture and local wisdom that is around students who are integrated with the concepts that will be learned so that students can think scientifically about the phenomena they encounter every day. One way to incorporate local wisdom-based learning through the creation of ethnoscience-based modules. Ethnoscience is genuine knowledge of society in the form of language, customs, culture, morals, and even technology made by societies in which there is a scientific knowledge that can be tested through literature review, scientific explanation, and scientific work [7]. Ethnoscience-based module is contextual by linking local wisdom around the student's residence into the lesson concept learned so that the learning that occurs will be more effective in improving student learning outcomes [8], improving students' cognitive abilities 90.63% [7], able to train students' science process

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skills in 100% observation aspects, formulate problems, hypothesize, identify 71.43% variables and interpret data, draw conclusions, and communicate 100% data [9]. Learning process in the 21st century is also can not be separated from technology. Based on the learning outcomes of ethnoscience-based learning, EtsE-Module it is an electronic module based on ethnoscience in Demak, a city in Central Java Indonesia which utilises lime as acne medicine on the acid-base material of Grade VII students in the first semester therefore students are expected to improve the process of scientific thinking Against the phenomena that exist around the students.

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2. Discussion

Indigenous Science in Science Learning can help the students in bridging the initial knowledge of the students therefore, we can bring them to learn the concepts according to the material in the learning curriculum. The genuine knowledge of society is one of the studies in ethnosciences that can be applied to learning resources in the classroom [7]. Ethno-based learning makes it easier for students to recognise facts, phenomena and events that exist in society and integrate with the scientific knowledge they learn hence students will be more interested in learning the concept in science [9]. The diversity of knowledge society in Indonesia can be a material for discussion of students in the classroom. Choosing the discussion materials during the learning process is a skill that teacher must have, especially the science teacher therefore as to be able to design the learning process in accordance with the objectives of Integrated Science learning materials are submitted and discussed in the classroom should be able to make students think critically. Teacher competence in preparing the learning materials will increase if the teacher has known the original knowledge that exists in the community therefore that the teacher can give an example to the students to related original knowledge in the community. This is evidenced by the research of [10] that prospective science teachers are able to prepare the teaching materials well after being given the task of analysing the original knowledge of the community in their residence area.

Learning based on ethnosciences is contextual learning, teachers have to know the environment around the students to associate social knowledge in the community into the learning process. Not all knowledge in society can be regarded as ethnosciences. The original knowledge of society must go through the first reconstruction phase into scientific knowledge. The reconstruction in question is the process of translating genuine scientific societies into scientific concepts, usually the original sciences of society derived through a process of direct observation in the culture therefore because the results of the reconstruction of original science are the concepts of science [11].

Based on the results of observations that have been done, the original science reconstruction of society in Demak in the utilisation of lime as acne medicine with the results in Table 1.

Table 1: The result of the reconstruction of the original science of the Demak community on the utilisation of lime as acne medicine

Topic	Indigenous Science	Scientific Science
How is the effectiveness of lime as acne remover	The average respondent answered that lemon is effective in removing acne if its use is frequent	The use of lime as an acne remedy according to research [12] has an increasingly longer contact time and more and more will make lime more effective in eliminating acne.
The effect is felt by respondents when using lime as acne remover	Respondents admitted that after using lemon felt sore (cache) on acne.	Painful at acne when utilising lime as acne remover is felt by some sensitive skin types [13]
Why lime is able to get rid of acne	Respondents said that lemon is effective to remove acne because lemon contains acid and there is vitamin C in lime	[14] shows that lime is able to inhibit the growth of <i>Staphylococcus aureus</i> bacteria which is one cause of acne.
The part of lime that used to remove acne	The average respondent using juice or citrus fruits	The content of essential oils and antibacterials contained in lime juice
How many times respondents use lime as an acne remover	To get rid of acne then people apply lemon every day until the acne disappears	Frequency of use of lime as an acne medication done for two to three times a day including contact time for five minutes [12]

Based on the results of the reconstruction of the science, the preparation of teaching materials can be loaded on the subject of science secondary school on the subject of acid and base. Students can discuss the process occurring in the phenomenon as well as inquire process on the topic according to the lesson plan that has been made by the teacher.

3.1 Acid-base Topic

The concept of IPA on Demak community habits that utilise lime in overcoming acne can be associated with acidic and

alkaline materials. The concept of acid and base is taught to the students of Secondary School VII grade of semester I. The material of acid and base is taught to students in the subchapter of acid, base, and salt solution. Acidic traits can convert blue litmus paper to red, the use of acids commonly found in digestive processes, present in foods and beverages or as home cleaning agents. Bases have characteristics that are slippery and somewhat bitter, turning red litmus paper into blue and are usually used in bath soap, laundry soap, shampoo, toothpaste, ulcer medication and also fertiliser. In addition, the application of acid in Demak society that uses acid contained in lime that is used to remove acne. The ability of lime in eliminating acne is caused because the bacteria that cause acne can not live in an acidic atmosphere [14]. In addition to the classification of acids and bases, the application of genuine knowledge of the community in applying lime as a remover acne in the community Demak also included in the classification of living things because the cause of acne is *Staphylococcus aureus* into the kingdom of bacteria.

3.2 Module

The learning process can not be separated from the use of teaching materials used. One of the teaching materials that can help the learning process is a module. Modules are teaching materials that are arranged systematically in accordance with the curriculum used in accordance with the circumstances and potentials around the students so that students are able to study it independently in a certain time unit so that students are able to master the competence taught [15]. Students use the module independently so that the module is presented with good, interesting, illustrated and pictorial language in order to motivate students to understand science learning [16]. The development of the module based on ethnosciences has been done by many researchers before and able to improve the learning outcomes and the character of the students according to Table 2. Based on various research using e-module in the learning process, e-module gives good influence to the students' Can be seen in Table 2.

Table 2: The result of students learning outcome using e-module and ethnosciene

Source	Result
[17] (Kustanti <i>et al</i> , 2016)	The development of Integrated Science e-module based on service learning on the theme of "Air Pollution" can increase the critical thinking ability of VII grade students by 72.40% at the first meeting and 83.98% at the second meeting.
[18] (Perdana <i>et al</i> , 2017)	E-module learning media on science teaching Motion Dynamics material integrated with science process able to increase critical thinking ability at activity focus on questions with criteria 95.41%, observation and determination result 89.17% observation, questioning and answer classification question 88.75%, evaluating and 82.5% try to determine 82.5% action as well as e-module able to increase student's motivation in learning.
[19] (Benjamin, 2013)	E-module can improve students learning outcomes in India.
[20] (Limatahu <i>et</i>	Research on video-based electronic modules

<i>al</i> , 2017)	was conducted on students in Tidore Indonesia who showed that there was an influence on students after that module. Student process skills become higher with 85% value.
[21] (Diana <i>et al</i> , 2015)	E-module based problem based learning can improve students' critical thinking skills and reduce student misconceptions on ecological topic.
[22] (Mahendrani, 2015)	The learning based on ethnoscience using booklets can improve students' learning outcomes in the cognitive domain with 86.44% classical completeness and able to invite students to active in learning process.
[23] (Rosyidah <i>et al</i> , 2013)	The development of IPA module based on ethnoscience on Additive Substance materials can improve student learning outcomes in SMP Negeri 1 Pegandon Indonesia because 93.75% of students have reached minimum standarts .
[24] (Rahayu, 2015)	The development of Integrated Science module based on ethnoscience on the theme of Energy in Life is able to improve post test result with gain value of 0.58 with medium criteria and to develop student character.

The use of ethnoscience-based modules that improve student learning outcomes and character must be balanced with structured materials in modular form. Submission of material to students can not be separated from the development of existing technology. The learning process should be done with the development of e-module based ethnoscience, therefore, the learning process will be able to integrate the original knowledge of the people of Demak in eliminating acne using lemon as the study material in the science material of substrate classification of Acid, Basa and Salt in the process of technology-based learning.

3. Conclusion

The learning process is not only done in the classroom but the students can also learn from the environment and society. The development of Ets-E-module is an electronic module based on local wisdom as the handling of junior high school students in studying Integrated Science phenomena in the community.

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