



Profile of Students' Scientific Attitudes Through Electronic Science Textbooks Based on Local Wisdom for Madura Salt Making

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Abstract: Scientific attitude is very important for each individual student, especially in the learning process. The purpose of this study was to determine the profile of students' scientific attitudes by using an electronic science textbook based on local wisdom of Madura salt making. The research was conducted at SMP Negeri 2 Pademawu. This study uses a descriptive method with a quantitative approach. The population in this study was all class VII SMP Negeri 2 Pademawu. Samples were taken using a simple random sampling technique. Data was collected using an observation sheet for students' scientific attitudes consisting of 3 aspects, 9 indicators, and 10 statements and using interview techniques to add information about science learning, research results are included in the category of quite good. Therefore, these results still need to be improved so that they become very good by using models, methods, strategies, and textbooks that can improve students' scientific attitudes, one of the textbooks that can be used is electronic textbooks based on local wisdom.

Keywords: Scientific attitude; Electronic textbooks; Local Wisdom

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Introduction

Learning is a process of relationship between students to change behavior for the better with the surrounding environment (Yektyastuti & Ikhsan, 2016). According to Jamil (2019) learning is an interaction between teachers, students, methods, models, materials, media, approaches in one learning concept in an assessment. The learning process will be achieved if educators and their education system can create an education that is meaningful, fun, dynamic, creative, for example through observation or practicum activities so as to increase students' curiosity and learn to appreciate logical data/facts (Ratnasari et al., 2018). Learning is currently directed at an active, critical, and creative atmosphere to solve a problem through the development of thinking skills (Yolantia et al., 2021). In the science learning process, students will try to think critically in solving a problem because it is through

scientific activities (Rusni et al., 2020). So, in this case students are required to be active in carrying out activities that have been formulated in scientific activities.

Science learning is a science subject related to nature through directed human efforts in understanding nature in its contents from an observation (Jufrida et al., 2019). Science learning is expected to be a means for students to be able to learn about themselves and their environment and can be developed and applied in everyday life (Triyani, 2019). Therefore, science lessons are very important to be taught in schools and mastered by students because they can improve problem solving skills, provide better job opportunities, adapt to world technological developments and play a role in the formation of students' scientific attitudes (Sukarno et al., 2013).

The improvement of the science learning process does not deviate from the use of teaching materials such

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as textbooks. Textbooks are considered the most important tool used to transfer knowledge, to assess information and academic educational programs (Mohammed et al., 2015). According to Santoso et al (2018) in the modern era, such as technological advances, learning materials have developed. Schools that generally use printed books as learning resources are now in electronic form. This is in line with the opinion of Mohammed et al (2015) which states that since the invention of the printing press, the electronic textbook industry can facilitate the exchange of information and data via the internet and smartphones, making it easy for teachers to obtain large amounts of educational material in the form of electronic textbooks via the internet and can be used for learning anytime and anywhere.

Embong et al (2012) said that the benefits of electronic textbooks for students can be seen physically, academically, and psychologically, where readers can compress textbook content, making students happy because in electronic textbooks there are interesting features and can reduce the burden in learning. bring a book. This is in accordance with the opinion of Suyatna et al (2018) which states that electronic textbooks can be easily understood and visualized by students because electronic textbooks are classified as interactive, written in various colors, some moving illustrations such as videos, and animations. Textbook material as a source of information on the learning process should be made with characteristics that are in accordance with the environment and local wisdom in the student's area (Sudiana et al., 2015).

Science subjects in the 2013 curriculum are very relevant to be integrated with local content (Dewi et al., 2017). Local wisdom is a heritage that is rich in values, experience, and knowledge that can be implemented in education to learn traditional knowledge and contemporary knowledge (Surata & Vipriyanti, 2018). The real experience of students cannot be separated from the cultural knowledge they have (Risdiyanti & Prahmana, 2017). According to (Fiteriani et al., 2021) education is rooted in the nation's culture. Science learning can be done by integrating learning materials with the environment (Puspasari et al., 2019). Nurcahyani et al (2021) argue that in formal education it is necessary to include culture in the classroom such as ethnoscience as a learning innovation. Because students' real experiences cannot be separated from the cultural knowledge they have (Risdiyanti & Prahmana, 2017). One of the local wisdoms that can be connected with science learning is the manufacture of salt on the island of Madura.

The problem in science lessons today is the psychological problem of students. Students view science as an abstract subject to be understood so that science subjects still really need attention, especially on

interests and attitudes towards science as well as scientific attitudes (Asmar & Suryadarma, 2021). Zlirfan et al (2018) argue that there are two dimensions of attitudes that need to be developed in science learning. The first dimension of attitude towards science is attitude that refers to student responses. after they learn science. it means that students who are science literate will have a positive attitude towards science, care about the environment, and care about reading and writing science because by this they can articulate science in text form and can produce scientific knowledge. The second dimension is scientific attitude, an attitude that is directly related to one's opinion on scientific judgments and understanding scientific phenomena. Scientific attitudes require students to actively carry out a number of activities that can build knowledge independently during the learning process (Ratnasari et al., 2018). (Gokul Raj R & Malliga, 2015) argues that scientific attitude is the most important outcome in teaching science and scientific knowledge. In addition, in the era of technology and science, scientific knowledge is a must because it can provide positive value and increase interest in science.

According to Zlirfan et al (2018), scientific attitudes are important in determining motivation and enthusiasm to conduct scientific research in developing a deep interest in finding out natural phenomena. The formation of scientific attitudes is a demand from the community, especially the Indonesian people, such as in dealing with hoaxes and misconceptions (Kurniawan et al., 2019). This is in line with the opinion of Fahrnunisa et al, (2020) which states that the cultivation of scientific attitudes in students can provide a set of affective abilities needed to be able to distinguish incoming information from various sources. Hadiati et al (2019) argue that the scientific attitude carried out is a behavior that refers to a person's willingness to use a scientific method. Based on the results of interviews conducted with teachers, it was stated that the science teachers of SMP Negeri 2 Pademawu had never measured students' scientific attitudes. The aspects of scientific attitude in this study are curiosity, honesty and critical thinking. So with this, researchers are encouraged to conduct research on the profile of students' scientific attitudes by using electronic science textbooks based on local wisdom of Madura salt making.

Method

This research was conducted in October 2021 at SMP Negeri 2 Pademawu. Data collection techniques are carried out directly (offline). The study used a descriptive method, with a quantitative approach with the aim of describing the scientific attitude of students at SMP Negeri 2 Pademawu. The population in this study were all students of class VII SMP Negeri 2 Pademawu

which consisted of 3 classes, namely class VII A, VII B and VII C. The sample in the study using simple random sampling technique was obtained by the research sample of students in class VII A with a total of 30 students. The sample selection was based on the results of initial considerations by looking at the local potential for making salt which is located close to the school at SMPN 2 Pademawu. In this study, there are 3 procedures, namely the preparation, design and implementation stages.

Table 1. Category of ability Scientific attitude

Score Range	Category	Score
$\bar{X} > \bar{X}_i + 1.80 SB_i$	Very good	A
$\bar{X}_i + 0.60 SB_i < \bar{X} \leq \bar{X}_i + 1.80 SB_i$	Good	B
$\bar{X}_i - 0.60 SB_i < \bar{X} \leq \bar{X}_i + 0.6 SB_i$	Enough	C
$\bar{X}_i - 1.80 SB_i < \bar{X} \leq \bar{X}_i - 0.6 SB_i$	Less	D
$\bar{X} < \bar{X}_i - 1.80 SB_i$	Very less	E

Description:

$$\bar{X}_i = 1/2 (\text{max score} + \text{min score})$$

$$SB_i = 1/6 (\text{max score} - \text{min score})$$

$$\bar{X} = \text{Average score}$$

Data collection was carried out using observation sheets consisting of 3 aspects, namely the curious attitude aspect with 4 indicators including enthusiasm for seeking answers, enthusiasm in listening to the explanations given, following the science learning process, and paying attention to the object being observed, honest aspects with two indicators including taking notes. the results of observations by not cheating on other groups and aspects of critical thinking attitudes with three statements including not ignoring the data even though it is small, asking for any changes (new things) and doubting the findings of friends. In addition, interviews with teachers were also conducted to add more in-depth information related to the implementation of learning that is usually done in class. The determination of the category of scientific attitude

ability is based on the equation in Table 1 (Widoyoko, 2011).

Result and Discussion

Scientific attitude is a consideration and exploratory behavior to facilitate problem solving, produce information, and transfer research competence into an experience, scientific attitude is a disposition to seek the truth, think realistically and be sensitive in behavior (Ocak et al., 2021). Student attitude data is the result of the level of students in class VII A of SMP Negeri 2 Pademawu, East Java.

In this study, scientific attitude data was obtained from observations made during the learning process. There are three aspects of scientific attitude that are referred to by the research results (Rohaeti et al., 2020; John & Olatoye, 2014; Pandiavadivu & Sridhar, 2016; Wildan et al., 2019). Covers aspects of curiosity, honesty and critical thinking. The scientific attitude questionnaire consists of 9 statement indicators, namely enthusiastically seeking answers, enthusiastic in listening to the explanations given, following the science learning process, paying attention to the objects observed, recording observations by not copying other groups, not ignoring data even though it is small, asking for any changes (novelty) and doubt the findings of friends. The highest value for each statement item is 4. The following data from the observation of scientific attitudes for class VII SMP Negeri 2 Pedemawu, East Java can be seen in Tables 2 and 3.

Table 2. Calculation of Scientific Attitude Aspects for Class VII SMP Negeri 2 Pademawu, East Java

Aspek	Rerata	(%)	Kategori
Curious attitude	2.78	70.00	Quite good
Honest	2.72	68.00	Quite good
Critical thinking attitude	2.45	61.00	Quite good
Average		66.00	Quite good

Table 3. Calculation Results of Scientific Attitude Statement Indicators for Class VII SMP Negeri 2 Pademawu, East Java

Aspect	Indicator	Average	(%)	Categories
Curious attitude	Enthusiastically looking for answers	2.93	73.00	Good
	Enthusiastic in listening to the explanation given	2.70	68.00	Quite good
	Following the science learning process	2.77	69.00	Quite good
	Pay attention to the object being observed	2.73	68.00	Quite good
Honest	Record the results of observations by not copying other groups	2.80	70.00	Quite good
	Recording actual data	2.63	66.00	Quite good
Critical thinking attitude	Don't ignore data even if it's small	2.87	72.00	Good
		2.93	73.00	Good
		2.73	68.00	Quite good
	Ask for any changes (new things)	1.27	32.00	Very not good
Average			66.00	Quite good

Based on Tables 2 and 3 above, it can be categorized that the results of the observation of the scientific attitude of class VII A students of SMP Negeri 2 Pademawu are quite good. As for the details of the observation data, namely in the aspect of curiosity, an average of 2.78 was obtained with a percentage of 70% the category was sufficient. The highest to the lowest indicators from the aspect of curiosity, namely enthusiasm for finding answers, obtained an average score of 2.93 with a percentage of 73% including good categories, indicators following the science learning process obtained an average score of 2.77 with a percentage of 69% including good enough category, indicators paying attention to the object observed obtained an average score of 2.73 with a percentage of 68% including the category quite well, the indicator of enthusiasm in listening to the explanation given obtained an average score of 2.70 with a percentage of 68%. In the honest aspect, the average score is 2.72 with a percentage of 68% included in the fairly good category.

The highest indicator in this aspect is noting the results of observations by not cheating on other groups, the average score is 2.80 with a percentage of 70% including the good enough category, while the lowest indicator in this aspect is recording the actual data, the average score is 2.63 with a percentage of 66% category is quite good. In the critical thinking aspect, the average score is 2.45 with a percentage of 61% with a fairly good category. The highest indicator in this aspect is not

ignoring the data even though it is small, in this indicator there are 2 statements with an average score of 2.93 and 2.87 with a percentage of 73% and 72%, included in the good category, then the indicator asks for any changes/new things obtained an average score of 2.73 with a percentage of 68%, included in the fairly good category. the lowest indicator, namely doubting the findings of friends, obtained an average score of 1.27 with a percentage of 32%, including in the very poor category. The following is a description of the acquisition of the results of scientific attitude observations based on the bar chart shown in Figures 1 and 2.

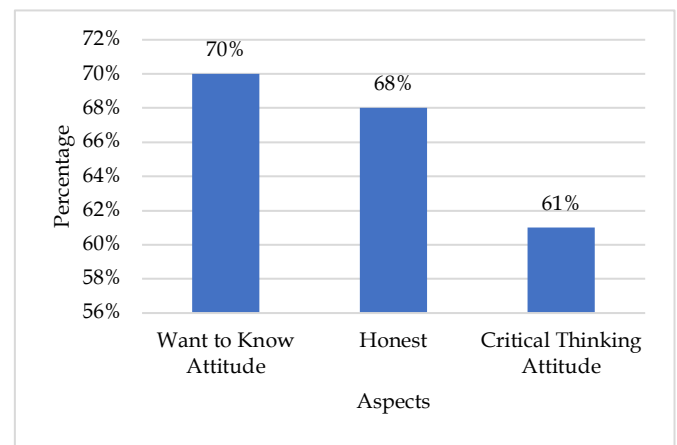


Figure 1. Percentage of scientific attitudes based on aspects (curiosity, honesty, critical thinking attitude)

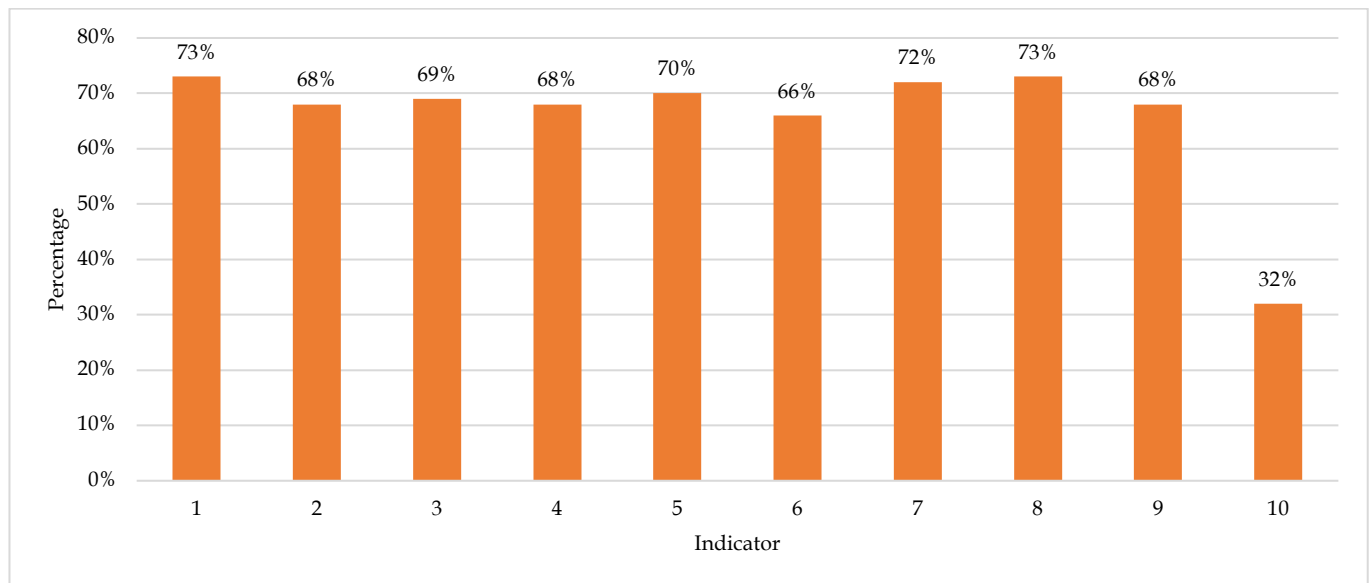


Figure 2. Percentage of acquisition of scientific attitude observations based on its aspects

Looking at the diagram above, the results of the observation of the average scientific attitude score are almost the same and still need to be developed in the science learning process. Scientific attitudes are the concern of educators because they can influence student engagement with learning materials, and can give and

develop positive attitudes towards a subject (Brown et al., 2015). As in the results of the observation of scientific attitudes in this study, the highest percentage is in the aspect of curiosity and the indicator of enthusiasm for answers. So, in this case when given problem students

are interested in finding an answer through electronic textbooks that are given in good categories.

Through electronic textbooks, students feel different learning because the textbooks used are packaged in electronic form using smartphones, while in their daily life students only use textbooks in printed form. According to Ambarita et al (2021) stated that learning will be more practical if it is designed according to the conditions of students. In the research, Santoso et al (2018) said that almost all students in Indonesia use and have smartphones. Meanwhile, on other indicators, namely following the science learning process, paying attention to the object being observed and being enthusiastic in listening to the explanation given, including the indicators are quite good. This is because students are less focused in participating in learning, some students just sit in class following learning activities without listening well. According to (Ridhlo, 2017), students must concentrate during the learning process because it has a major influence on the acquisition of learning outcomes, if students do not concentrate, their learning will be in vain, a waste of time, and costs. Good students are students who concentrate when the learning process takes place because they can feel the process and enjoy learning.

The acquisition of scientific attitude observations on the honest aspect consists of indicators of recording observations by not cheating on other groups and recording data that are actually included in the fairly good category because students cannot be independent in using their knowledge. They are still not confident enough to answer the questions according to the knowledge they have. So that students are not honest by still seeing the results of other students in working on the problems given by the teacher. According to Widyanti et al (2017) self-confidence is one of the most important aspects of personality contained in a person, they can realize their expectations by having a belief. Therefore, students will behave honestly if they are sure and confident to express a little or a lot of the knowledge, they have gained without copying other students' possessions during the learning process.

The results obtained from the observation of scientific attitudes on aspects of critical thinking are included in the fairly good category. The highest indicator is that the indicator does not ignore the data even though it is small in the good category, because students can record the results according to observations and report them according to the instructions on the student worksheets. According to (Pratiwi & Musfiroh, 2014) by writing students can convey an idea, concept, idea, and desire. So that students can record and report

an event in written form such as writing a report. The indicator asking for any changes (new things) is included in the fairly good category, while the indicators for questioning friends' findings are the lowest indicators and fall into the very poor category. This is because students do not think critically, when one student makes a presentation, the other students just listen without asking or giving suggestions and comments so that students tend to be passive and there is no student feedback during the learning process. According to Abdullah et al (2021) critical thinking skills are very important to be improved in classroom learning activities. The critical thinking attitude that exists in students can help students connect everyday experiences with knowledge in the science learning process.

Teaching materials can change the behavior of students towards their environment through the ability to think and the willingness to behave (Sumberartha et al., 2021). Teaching materials must also be varied with technological advances. According to Sukarno et al (2013) technological progress is growing rapidly and expanding so that it can change various patterns, especially in the pattern of education. Therefore, teaching materials need to be linked to local wisdom in the student's area, namely the manufacture of salt in the form of electronic textbooks. In changing student behavior, it can be seen from the content of teaching materials and changing the mindset of students first. So that scientific attitudes can be embedded in students. The following is a display of an electronic science textbook based on local wisdom of Madura salt making. Presented in figure 3.

Scientific attitude is a combination of various qualities and virtues that have been reflected in an action and behavior (Wildan et al., 2019). Scientific attitudes in science learning need to be developed during the science learning process. This is because a scientific attitude is a foundation for students to be able to respect the opinions and works of others and can also learn to respect themselves (Musyarofah et al., 2013). According to (Dhevakrishnan & Dr. S. Devi, 2018) students who have a scientific attitude will tend to have a love for the knowledge they have acquired, have an honest and scientific spirit and can solve problems through the knowledge they have. Therefore, teachers are very influential on the growth of scientific attitudes so that through electronic textbooks based on local wisdom on Madura salt making which were carried out in this study, teachers can improve a scientific attitude such as curiosity, honesty and critical thinking very well.

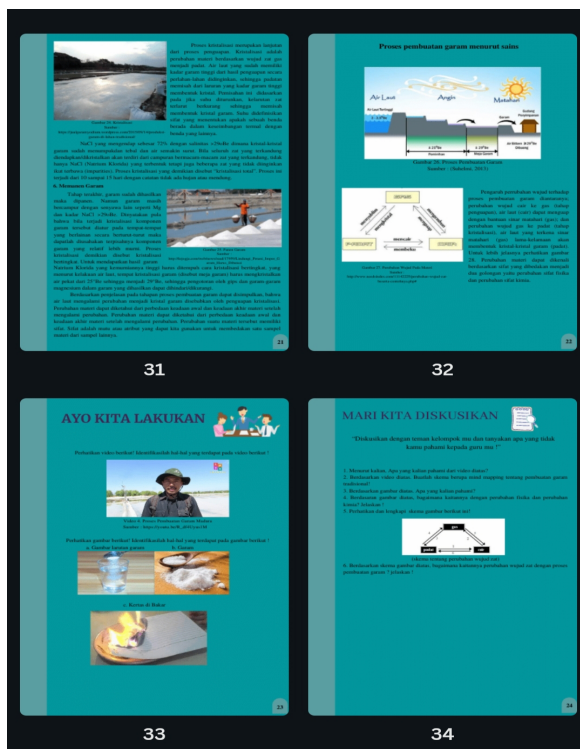
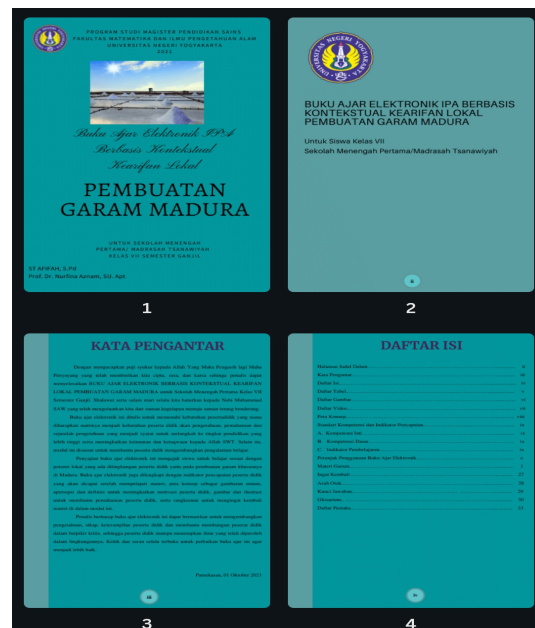
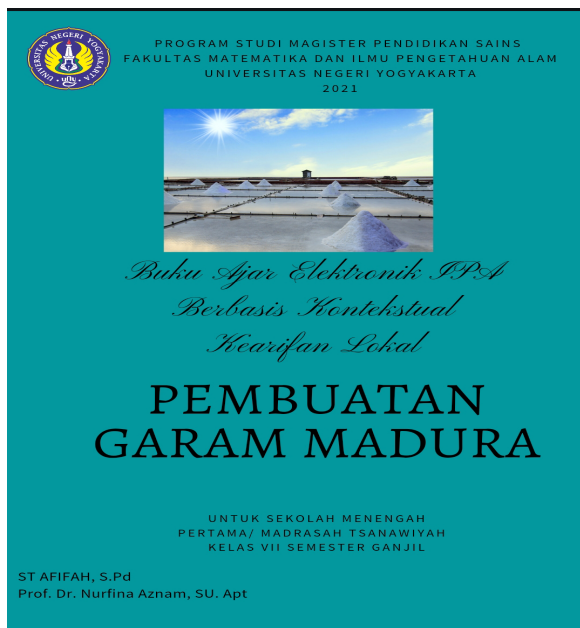


Figure 3. Display of electronic science textbooks based on local wisdom of Madura salt making

Conclusion

Based on the results of observations of scientific attitudes conducted in class VII A at SMP Negeri 2 Pademawu, it can be concluded that the profile of students' scientific attitudes is still in a fairly good category. So, in this case the scientific attitude still needs to be improved so that it becomes very good. It can be through modification of the teaching materials used, strategies, methods and models used. One of the

teaching materials that can be used is an electronic textbook based on local wisdom. The low scientific attitude of students is caused by the individual attitudes of students, such as lack of confidence, being passive, less consistent in participating in science learning, and being indifferent to the findings of friends.

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