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Utilizing of Comic and Jember's Local Wisdom as Integrated Science Learning Materials

Ayu A. Kurniawati, Sri Wahyuni, and Pramudya D. A. Putra

Abstract—The use of learning materials in accordance with the characteristics and students learning environment is one key to the success of integrated science learning. Comic and Jember's local wisdom can be used as learning materials in accordance with the characteristics of the student, interesting, and close to the students learning environment. This study conducted to describe the learning outcomes obtained with the use of comic and Jember's local wisdom as integrated science learning materials on the level of junior high school. The study design was quantitative descriptive with 35 samples of seventh grade junior high school (MTs Bustanul Ulum), Panti sub-district, Jember, Indonesia. The results obtained showed that the learning outcomes of students meet classical completeness of 85.7 % with an average value of 80.17 % and high category. This shows that utilizing of comic and Jember's local wisdom is an effective tools in teaching integrated science. This learning tools improved students performance and motivated them to learn.

Index Terms—Comic, Jember's local wisdom, learning materials, learning outcomes.

I. INTRODUCTION

In Indonesia learning science in junior high school received special attention since last 10 years. Special attention in the form of a change in the system of learning science. Learning science converted of learning as a discipline of sciences into learning in an integrated science. Success or failure of the integrated science learning in the classical style can not be separated from the role of learning materials used [1], [2]. Selection of appropriate learning materials (according to student's competency) can maximize the effectiveness of learning in the classroom [3]. As a facilitator, the teacher responsible for providing, making, or selecting learning materials appropriate to the characteristics of students and learning environments [4].

Judging from Piaget's theory of learning psychology, the characteristics of junior high school students in Indonesia (aged 11-14 years) are in a period of transition from the concrete operational stage to the stage of formal operations [5]. In this transition period students need a media that can help to think abstractly, logic, and complex. Comics can be used as a medium that bridges of understanding more complex texts [6] and helps students to better enjoy reading [7]. Comic has several advantages if it used in learning, such

as simultan. Comic stimulating learning activities of students because the language used is more common and easier to understood [8]. Other than that, comic if it is used in such learning can motivate students with the collaboration of pictures and interesting text [9]. In addition, student's interest in comics can make learning to become more active in the vibrant debate and discussion, so that the use of comics as teaching materials to help teachers make learning activities more meaningful [10]. Meaningful learning will provide more experience and have more value for students in understanding the concept and meaning of learning. The use of comics that is oriented on real-life and character that is familiar to the students to have more value if used in learning.

The learning environment of students in each region is different. In Indonesia each region may have different regional advantages. Therefore, an integrated science learning also aims to introduce a variety of advantages surrounding territories [11]. Local wisdom is a form of regional advantages. Local wisdom is noble values applicable in the governance of public life to protect and manage the environment [12]. As learning materials, the use of local wisdom according to Indonesian youth education [13]. Scientific explanation of the cultural phenomenon around the students (local wisdom) can help students understand the relationship of their life-world and what they are learning in science school [14]. Local wisdom that is rooted in the student's life is a form of direct experience that is contextual. So the use of local wisdom in learning materials to help students understand concepts in contextual and correct. Through local wisdom, students can learn the values of the culture and sense of nationalism that may affect learning outcomes (attitudes, behavior, and thinking ability) [15].

Jember is a regency in Indonesia who have local wisdom in the management of coffee plantations. Coffee is the commodities that was developed by the people and the Jember Regency Government [16]. Panti (sub-district in Jember) is one area that has a coffee plantation called Gunung Pasang Coffee Plantation [17]. The existence of these coffee plantations make the students in these areas is very familiar with local wisdom in the form of coffee plantation management. This is due to a lot of parents are farm workers and some of the even have a small coffee plantation in this yard. Through learning materials based on local wisdom will facilitate students in the area to accommodate traditional knowledge based on science knew [18].

This study is based on the importance of the use of learning materials in accordance with the characteristics and environment of students in integrated science learning. The

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use of comics as learning materials have advantages that can be considered and also the use of local wisdom in teaching materials become necessary to note. Based on the above assumptions, the use of comics and Jember's local wisdom (management of people's coffee plantation) as learning materials in accordance with the characteristics of the students need to be implemented. This study was conducted to describe the integrated science learning outcomes in junior high school, obtained using comics and Jember's local wisdom as learning materials are attractive and close to the learning environment.

II. RESEARCH METHODOLOGY

A. Participants of the Study

Participants in this study were 35 students of seventh grade junior high school (MTs Bustanul Ulum), Panti sub-district, Jember, Indonesia. Participants were randomly selected to assume that all participants are homogeneous.

B. Research Design and Methods

This study aimed to describe the learning results obtained by the students after using comic and Jember's local wisdom as integrated science learning materials. The design study is quantitative descriptive.

Learning materials that using comic and jember's local wisdom before use in integrated science learning have been done the validation tests conducted by experts and declared valid as a good learning materials. After that, the learning materials were distributed to students to be used in learning activities. During learning activities, teachers and students perform learning such as reading, discussing, experimenting, and doing exercises using learning materials that have been distributed. Some examples of parts of learning materials using comics and Jember's local wisdom is as follows.

Learning outcomes is the accumulation of the third domain such as affective (spiritual and scientific attitude), cognitive, and psychomotor (scientific work). Learning outcomes measured during and the end of learning. The technique of data acquisition and instrument types to use as follows on Table I.

TABLE I: TECHNIQUES AND INSTRUMENTS OF LEARNING OUTCOMES

Learning Outcomes	Technique	Retrieval Time	Instrument
Affective	Observation	During learning	Observation sheet
Cognitive	Paper test	At the end of the learning	Post Test sheet
Psychomotor	Test performance	During learning	Performance evaluation sheet

The third domain of learning outcomes obtained by each student are then accumulated based on the formula set forth as follows.

$$LO = \frac{2A + 5C + 3P}{10}$$

Information:

- LO = Learning Outcomes
- A = Affective
- C = Cognitive
- P = Psychomotor

This formula is the provision of junior high school (MTs Bustanul Ulum) to determine the integrated science learning outcomes, defined by characteristics of students and school goals. After learning outcomes cumulatively obtained, then the data is grouped by a minimum completeness criteria for each individual (≥ 70) as the group thoroughly studied and are not thoroughly studied.

In addition, the results of accumulative learning outcomes of each student, and the average of all student learning outcomes are categorized based on the following categories [19]. The category of learning outcomes can be seen on Table II below.

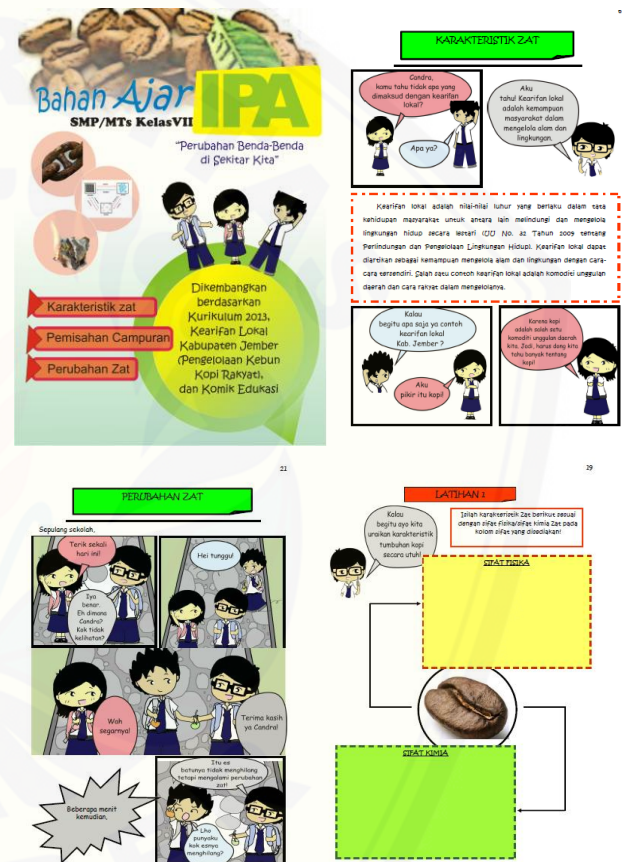


Fig. 1. Learning materials that using comics and Jember's local wisdom.

TABLE II: THE CATEGORY OF LEARNING OUTCOMES

Interval	Category
$0 \leq LO < 40$	Very low
$40 \leq LO < 60$	Low
$60 \leq LO < 75$	Medium
$75 \leq LO < 80$	High
$80 \leq LO \leq 100$	Very high

III. RESULTS

A. Accumulative Learning Outcomes Each Student

After learning activities using comics and Jember's local wisdom as teaching materials implemented, then the group of data obtained thoroughly studied and are not thoroughly

studied as follows on Table III.

TABLE III: MASTERY LEARNING OUTCOMES

Total of students	Percentage	Group
30	85.7%	Thoroughly
5	14.3%	Not thoroughly

Based on Tabel III is known that students who thoroughly studied at 85.7 %. It shows the learning outcomes students obtained meet minimum completeness criteria in the classical, because the percentage of students who thoroughly studied more than 75%. In addition, the catagories of learning outcomes accumulative each student who obtained are shown in Fig. 1.

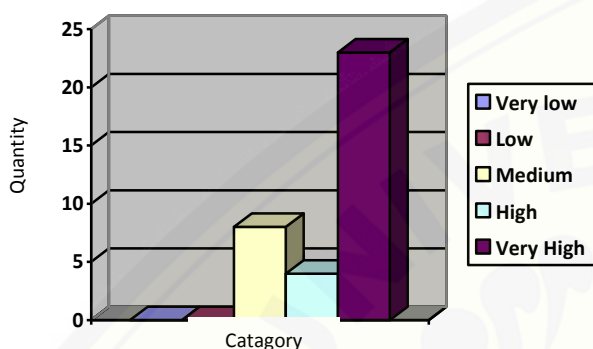


Fig. 2. Learning outcomes.

Fig. 2 shows that minimal learning outcomes obtained classified in the medium category. Most (23) students getting a learning outcomes in the category of higher learning which means students have mastered the competencies well. The high learning outcomes obtained can not be separated from the role of learning materials that use comics and Jember's local wisdom. This is due to students interested in reading and studying the learning materials as developed by the comic. Comic really efficient in communicating science [20] and effectively used in learning because it allows students to absorb the concept of learning [21]. In addition to its use comics, the use of Jember's local wisdom which is already known to the student plays a fairly impotant. According to research conducted Pramadi *et al* in Bali, comics and local wisdom positive effect on learning outcomes obtained [22].

B. Average of Learning Outcomes

Average of all students learning outcomes are shown in Table IV.

TABLE IV: LEARNING OUTCOMES ACQUIRED

Learning Outcomes	Mean	Learning Outcomes Accumulated
Affective	83.51	80.17
Cognitive	75.43	
Psychomotor	85.86	

Based on Table IV, it can be seen that the average affective and psychomotor domain is higher than cognitive domain. This can happen because the learning materials used which is the comic and Jember's local wisdom for all domain of learning that is affective, cognitive, and psychomotor is effective learning tools. Affective learning can not be ignored

in integrated science learning, for scientific attitudes required in the process of the invention or building science knowledge. Good learning outcomes demonstrated with a good attitude [23]. Psychomotor learning need to be considered for the science process of finding out the principle/scientific fact built with scientific attitude. Agree with Rahayu *et al*, psychomotor domains of learning needs to be improved, so that learning science is not only focused on knowledge (cognitive) but also the discovery process [24].

Learning each domain appear in any part of learning materials using comics and Jember's local wisdom. The details of each domain of learning are as follows:

- 1) Learning of the affective domain is shown in the form of an invitation to pray before the start of activities, invitations to preserve the environment and the people of the surrounding coffee plantations, and being open to discussion or scientific performance.
- 2) Learning of the cognitive domain is shown in the form of learning materials and various exercises that are presented with interesting use of comics and associated with Jember's local wisdom.
- 3) Learning of the psychomotor domain is shown in a series of vocational training such as investigating the physical properties and purifies the water around a coffe plantation.

On average accumulative learning outcomes of all students was 80.17. This value indicates that student's learning outcomes obtained after the use of learning materials with comics and Jember's local wisdom is in high category. These results indicate that the use of comic and Jember's local wisdom as integrated science learning materials effectively influenced the learning domains of the learner such as follows; affective, cognitive, and psychomotor.

IV. CONCLUSION

Based on the findings of the study it can be concluded that comics and Jember's local wisdom (people coffee farm management) as integrated science learning materials is very effective to helps students to improve affective skills, cognitive ability, as well as the psychomotor skills of the learners. The students learning outcomes obtained that psychomotor and affective domains are more improved than cognitive domain. Students are motivated to learn because this learning tools is interactive and applied in a real-life experiences and situation of the learner and in the teaching.

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