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# Local wisdom-based e-encyclopedia as a science learning medium in elementary school

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# Local wisdom-based e-encyclopedia as a science learning medium in elementary school

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**Abstract**. The number of online encyclopedias is still limited and generally, they are not too interesting to be read by students since they tend to load information about unfamiliar animals for students. This paper seeks to describe the use of local wisdom based electronic encyclopedia as a learning media in the Science subject in Elementary school. This research was conducted on elementary school students in the city of Malang with 82 people using data collection instruments. Such as questionnaires and observation sheets. The research was carried out through several stages, namely the analysis stage, production stages, product design and evaluation stage. The finding show that local wisdom-based animal based e- encyclopedia are good in terms of content, presentation, language and the use of online encyclopedia triggers students to be more motivated and enthusiastic to learn during the learning process. The familiar contents and concepts given made a more meaningful learning process for students.

## 1. Introduction

Electronic learning media have been widely developed so as to support learning process in the classroom, one of which the use of prezi [1-5]; prezi by combining adventure and text game [6], Multimedia [7]; that is adopted by adjusting to student's characteristics [8]; Creation and social network multimedia [9], eye tracking multimedia [10]; e-book [11]; e-book audio narration [12] Animated Ebook [13] and so on and so forth. Nowadays, encyclopedia is rarely used to support the learning process in the classrooms despite the fact that it is able to be a right and complete reference or a source to be used in the learning process.

Coconi explain some advantageous of encyclopedia in students learning process [14]. First, encyclopedia lists materials or articles that are thoroughly presented completed by illustration, map, graphic, and photos. These allow students to grasp information in a more effective and fun way. Second, encyclopedia is considered as a good and reliable source since they are a compilation of knowledge from various experts that are arranged by hierarchy system. Third, the user of encyclopedia is limitless and fourth, encyclopedia is able to improve learning outcomes, students' comprehension towards the concept and also their learning motivation [15].

Encyclopedia has been developed in printed and non-printed form. However, the available encyclopedias only include limited contents and materials and the contents haven't integrated local wisdom as supporting materials in the encyclopedia or examples, particularly in Science subject. The integration of local wisdom into the materials allow students to get a holistic and meaningful learning that in turn will make them aware of their surrounding environment. The right learning design will lead

to a more efficient learning [16], make students more independent [12], motivated and perform better learning outcomes and more meaningful [11]. Ausubel relates a meaningful learning process to a process of linking new materials into relevant concepts in ones' cognitive structure and this way enables them to grasp the information or knowledge better.

On the other side, the number of gadget users in Indonesia keeps increasing. The users of gadgets come from almost every level of society that allows global information through internet come freely. This is not really an ideal situation for children who might not able to filter the coming information. Today, many children have access on the source of information that is not suitable for their age. The effects of the freedom of information and technology then arise such as adolescents' problems, criminality, students are easy to feel satisfy of their learning through internet [17,18]; students' limited social interaction [19], depression [20], and social anxiety [21]. These problems can be coped with local wisdom based learning since it has strategic roles which covers 1) local wisdom learning is able to build students' identity, 2) local wisdom is a familiar value for students, 3) local wisdom involves students' emotion towards the society to make them have a strong bonding with their local wisdom environment 4) it may grow students' pride of their local environment, and 5) it may increase the country's dignity [22].

Local wisdom - based learning is able to integrate local wisdom into the curriculum and the learning process through a government sector, private sector, religious institutions, and particularly through education institutions sector [23]. The integration of local wisdom contents in the educational institutions sector can be developed in five dimensions that include [24]: 1) local knowledge, in the form of information, knowledge, and society's data about local uniqueness, 2) local culture, something related to cultural aspects that have been growing and patterned as the society's tradition which cover ethics, language, traditions, and technology; 3) local skills, skills of the society to apply and make use of their knowledge; 4) local source, relating to sources owned by society to fulfill their basic needs and to do their main tasks; and 5) local social process that is related to how a society do their tasks or functions, social movement that is made, setting of social relation, and the existing social control [25] . From the aforementioned factors, this paper tries to develop a local wisdom based animals E-encyclopedia that is used as a learning media in Science Subject in Elementary school.

## 2. Method

The study involved 130 students at three elementary schools named SDN Karangsuko, SDN Sukun 02, and MI Mambaul Ulum. The participants in Malang Regency were chosen purposively. To collect the data needed, the study employed two data collection instruments namely learning observation sheet and media validation sheet. The data were then analyzed through qualitative data analysis technique by Miles and Huberman that was conducted by collecting data, reducing data, presenting data, and making conclusion from the data gained. The steps to conduct the research can be seen in the Figure 1.
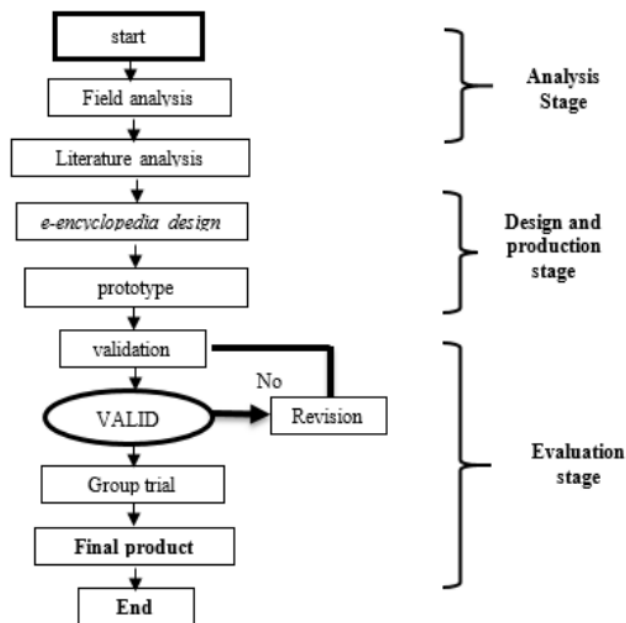
**Figure 1.** The Step of research.

Figure 1 explains:

*2.1. Step of analysis*

- Field study analysis was conducted to find out problems, learning process, and students' characteristics of the investigated site. Students' characteristics are seen form their learning styles, learning interests, and score. This step employed questionnaire and observation to collect data
- Literature review was carried out to discuss theme that is investigated basic competence, indicators, and learning objectives.
- E- encyclopedia Learning Media Designing and Production step
- Making E- encyclopedia concept by discussing Science materials which cover animal's concept, making flowchart, and also making draft of learning procedure concept based in standard competence, basic competence, and indicators that is realized in the form of list of materials, worksheet, and evaluation sheet
- E- encyclopedia arrangement. Through this step, illustration, such as pictures and videos were chosen and the font of size of the font used were also determined.

*2.2. Evaluation step*

- The validation and test step include: (a) validation to content expert, validation to learning media expert & validation to language expert, this validation and piloting step employed was conducted by using questionnaire.

### 2.3. Revision step

This step involves two steps: (a) revision towards the learning materials and the presentation of learning materials (b) result from the revision was used as the final product to be used in the research.

### 2.4. Final product
Final product is none other than E- encyclopedia that has been tested and has been proven appropriate to be used in the study. The data gained were then analyzed quantitatively by using the following formula: Equation 1. formula for calculating the percentage of validation results.

$$Percentage = \frac{the\ gained\ score}{the\ total\ of\ ideal\ score\ in\ 1\ item} X100\%$$

**Table 1.** Result of product development conversion.

| Achievement level | Qualification | Description |
|---|---|---|
| 90% - 100% | Very appropriate | No need revision |
| 75% - 89% | Appropriate | No need revision |
| 65% - 74% | Appropriate enough | Need Revision |
| 55% - 64% | Less appropriate | Need Revision |
| 0% - 54% | Not appropriate | Need Revision |

## 3. Results
The study was conducted by previously having a need analysis toward the participants that is investigated. This need analysis consists of students' characteristics analysis and learning materials analysis. The results from students' need analysis reveal students' learning styles and also their use of gadgets that can be seen in figure 2.
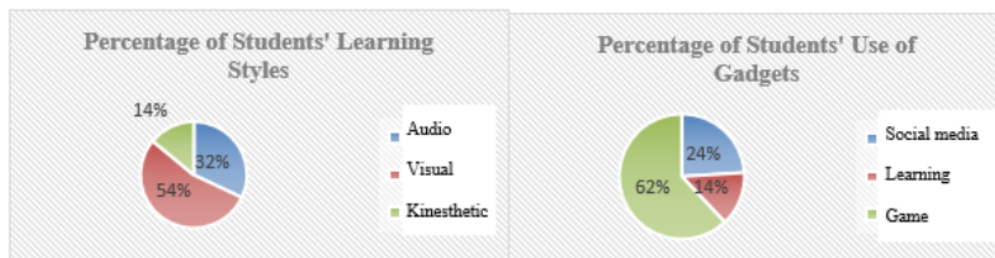


**Figure 2.** Percentage of students' learning styles and students' use of gadget.

Based on figure 2, it can see that 54% students have visual learning styles, 32% students are audio, meanwhile the rest 14% students have kinesthetic learning style. This implies that most of students' learning style is visual. This result was then used to determine contents of E-Encyclopedia need to load more of visual learning media and use more of visual media based learning process.

   Percentage of students' use of gadgets which reveals that in general, students use their gadget to have social networking (47%). Meanwhile 30% of students use their gadget for studying, 15% others use their gadget to play games, and the rest 8% for other purposes. This result implies that the use of gadget mostly arises for communication and social networking purposes instead of studying. Accordingly, so as to improve the benefits of gadgets among students and to improve their learning motivation, E-encyclopedia needs to be developed well so as to be easily accessed by students whenever they like and where they are.

Result from need analysis was used to develop E-encyclopedia by inserting materials that are integrated with local wisdom, such as animals in their surrounding or animals in Indonesia. The result of E-encyclopedia can be seen in figure 3.



**Figure 3.** Display of e-encyclopedia.

The final result of E-encyclopedia was then validated through expert's judgment in terms of its content, language, and also in terms of its information and technology aspect. The result of validation is presented in the following (Table 2).

**Table 2.** Result from expert's judgment validation.

| No | Expert | Score | Criteria |
|---|---|---|---|
| 1 | Materials | 3,68 | Appropriate |
| 2 | Language | 3,5 | Appropriate |
| 3 | Information and Technology | 3,58 | Appropriate |

Table 2 showed that E-encyclopedia' criteria in terms of learning materials, language use, and its information and technology aspects is appropriate and can be used in the learning process. After that, this E-encyclopedia was used by elementary school students in their Science learning process. Data from observation showed that during the learning process, students are found more excited, motivated, and enthusiastic to learn, students are more familiar with the animals presented in the E-encyclopedia. However, students are found still face some difficulties in identifying organs systems of the animals given as an examples. The finding implies that students are enabled to gain more information through the use of E-encyclopedia. In addition, the use of interesting illustration such as photos and videos in the E-encyclopedia allow them to comprehend the materials better since they are helped to understand abstract concept in the learning materials about animals.

Further, it was also found in the study that students show their interest towards the local wisdom aspect integrated into the contents of the E-encyclopedia. This can be proven by their enthusiasm and active participation during the learning process. The local wisdom aspects that are integrated into the contents in the E-encyclopedia are local knowledge about animals exist in the surrounding environment, their characteristics and experiences with the animals, particularly animals in Indonesia.

## 4. Discussion

Local wisdom based E-encyclopedia is created by developing more familiar materials for students and also by integrating local wisdom exist in the society. Local wisdom will be important and useful only when local people who inherit the knowledge system are willing to accept and claim things that become

cultural values as part of their lives by making it a source of educational material, which can become a bridge for students to be recognize and get closer to cultural values in their area [15].

The form of integration of local wisdom can be through integration in processes, teaching materials and learning media. Learning media that are inserted to the E-encyclopedia are adopted by adjusting to the students' characteristics and this is believed effective to help students learn better [8], increase student motivation [15], Student achievement [26] and Nationalism [27].

The values and sources integration such as more familiar animals help students to be more motivated to learn. Motivation is an important aspect for learning since it will trigger students to learn more and more and show positive attitude towards the learning process. Motivation is related to the power of students' learning performance that in turn is able to determine the endurance of their learning and give direction to their learning so as to achieve the learning objectives [28]. Local wisdom aspects enable students to build their character to the better shape based on the values that grow in their society. The right values integration can be accepted well by students.

## 5. Conclusion

The development of animals E-encyclopedia consists of need analysis, E-encyclopedia arrangement, E-encyclopedia development, E-encyclopedia validation through expert judgment, and the implementation of the E-encyclopedia in the classroom. The implementation showed that E-encyclopedia can be used as a more interesting and meaningful learning media since students have been familiar with the contents (animals) they learn with more detailed explanation of the concept. The integration of local culture and wisdom into the learning process in the E-encyclopedia make students comprehend the values exist in their society. The development that is suitable with students' characteristics is able to improve the learning outcomes and is able to create a more effective and meaningful learning for students.

## Acknowledgment

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