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Designing and analysing electronic student worksheet based on Kvisoft Flip Book Maker for elementary school student

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Abstract. This study aimed at designing Electronic Student Worksheets based on Kvisoft Flip Book Maker on thematic learning for grade III and IV of elementary school as well as analysing its effectiveness. The developed of Electronic Student Worksheets was analysed with descriptive analysis methods with observation sheet instruments adjusted with criteria of Electronic Student Worksheets. The worksheet criteria consisted of content, language, cognitive level, features, and utilities. The analysis results show that the developed Electronic Student Worksheet is satisfactory in terms of content and language. However, in terms of cognitive aspect, it still covered in the Low Order Thinking Skill, particularly at the C1-C3 level. In addition, the language used is suitable, as well as the aspect of features and utility. For the future development, it is important to develop an instructional media that covers HOTS of student to stimulate student's ability in terms of reasoning and problem-solving. In addition, it is necessary to develop electronic student worksheet that have interesting features and easy to use to help and motivate students learning. The implication of this research is that appropriate evaluation instrument will be able to develop students' thinking abilities and interests in learning.

1. Introduction

The development of technology and communication has an influence on education, especially in learning process [1,2]. Rapid technology development leads to changes in improvement of teaching process, especially in the use of electronic instructional materials. One of the electronic instructional materials that is often used in classroom is the Electronic Student Worksheet. Electronic Student Worksheet is an electronic instructional material which covers a summary of lesson topic, questions and instructions for the implementation of tasks that comprises of text, audio and audio visual that must be done by students and refers to the basic competencies that must be achieved. This instructional media is designed in the form of interactive multimedia.

Preliminary studies conducted in several five elementary schools in Malang reported that the schools are facilitated by technological infrastructures such as computers/laptops, audio speakers, and computer laboratory. In spite of the fact that these facilities have not been used optimally, several teachers have utilized technology in their classroom. The interview results show that students are contented if the teacher use ICT technology in the classroom. Teachers must have the skills, content and learning management to change classrooms by utilizing technology [3].

Several previous studies have discussed the development of Electronic Worksheet based on Adobe Flash Cs6. One study reported that the development of instructional media obtained an average score



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of 74% and 93% from content and media expert [4]. Another one has reported that 72% of students were attracted during the learning process by using instructional media [5]. Electronic Worksheet also plays an essential role for teacher to provide meaningful information automatically and offer a prompt and proper feedback [6]. In addition, another research has confirmed that the development of Electronic Worksheet obtained a valid, practical, and meaningful results [7]. Furthermore, another research developed Smart Electronic Worksheet to increase student's learning motivation [8].

The difference with the results of previous studies is this research focused on designing Electronic Student Worksheets based on Kvisoft Flip Book Maker on thematic learning. Kvisoft Flip Book Maker is an interactive multimedia software to transform PDF files into flash pages which each page can be flipped like a conventional book. This software can change the appearance of PDF files to be more interesting like conventional book in digital form. Kvisoft Flip Book Maker is proven to be a good and suitable virtual flipbook to create easy and effective instructional media since the operating system is uncomplicated and it is facilitated by music and animation that are attractive for students [9]. This study aimed at designing and analysis of effectiveness using Electronic Student Worksheets based on Kvisoft Flip Book Maker on thematic learning of III and IV grades of elementary schools.

2. Methods

The development of Electronic Student Worksheets was based on the Dick, Carey and Carey models using Kvisoft Flip Book Maker. The stages of the research are shown in Figure 1 below.

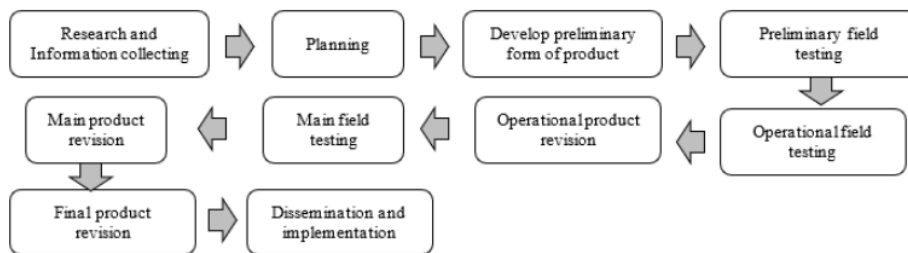


Figure 1. Flow chart of learning design model of Dick, Carey & Carey [10].

The Electronic Student Worksheets that have been developed was further analysed in terms of the effectiveness. To collect the data, it used questionnaire as the research instrument. The Electronic Student Worksheet based on Kvisoft Flip Book Maker was tested to the teachers and students of III and IV grade of elementary school in Malang. It involved 25 students and five teachers. The research stages are presented in the following Figure 2.

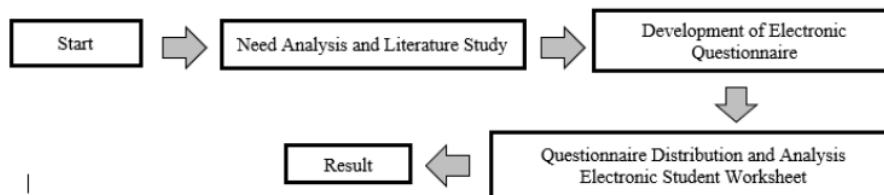


Figure 2. Stage of analysis electronic student worksheet [11].

Based on Figure 2 can be describing the research steps are:

- Need Analysis And Literature Study. At this stage a needs analysis and literature study was carried out to determine the needs in the field using interviews.
- Development of Electronic Questionnaire. Based on the results of the needs analysis, a questionnaire was developed to measure the suitability of the Electronic Student Worksheet Scores based on indicators of content, language, cognitive level, presentation and usability. Electronic questionnaire were given to teachers and students via Google form.
- Questionnaire Distribution and Analysis Electronic Student Worksheet. Questionnaires were distributed to teachers and students. The results of the questionnaire were analysed by using quantitative descriptive analysis. The results of the questionnaire were analysed using the following formula:

$$p = \frac{\text{obtained score}}{\text{maximum score}} \times 100\%$$

The criteria of assessment are presented as follows.

Table 1. Criteria of assessment [12].

Percentage	Classification
>80	Very Good
> 60-80	Good
> 40-60	Moderate
> 20-40	Less
≤ 20	Very Less

3. Result and discussion

3.1. Result

The compiled Student Worksheet was then converted into an Electronic Student Worksheet using Kvisoft Flip Book Maker. The process of making an Electronic Student Worksheet using Kvisoft Flip Book Maker is presented in Figure 3 below.

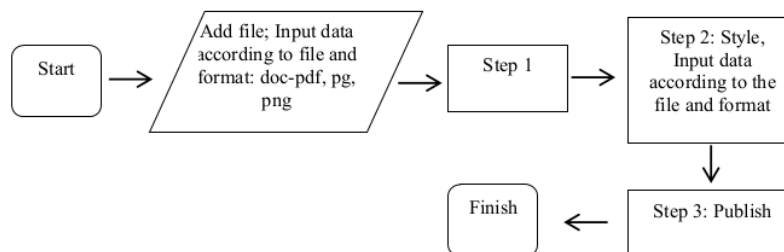


Figure 3. Flow chart of electronic worksheet development by using Kvisoft Flip Book Maker.

This research resulted a prototype of ⁵ Electronic Student Worksheet based on Kvisoft Flip Book Maker. Electronic Student Worksheets based on Kvisoft Flip Book Maker is presented in Figures 4 and 5 below.

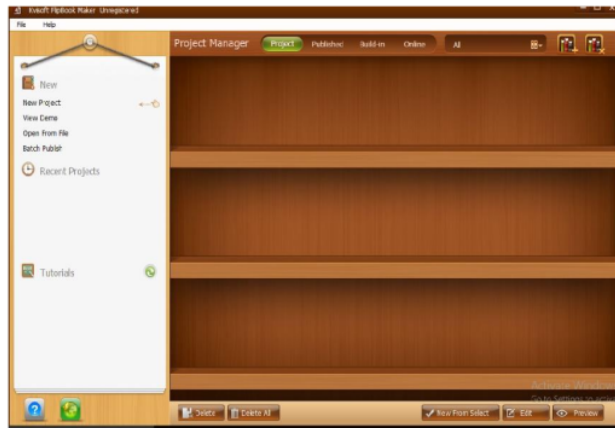


Figure 4. Initial display of Kvisoft Flip Book Maker.



Figure 5. Display of content in electronic worksheet based on Kvisoft Flip Book Maker.

Electronic Student Worksheets based on Kvisof Flip Book Maker that have been developed through the stages of the Dick, Carey & Carey model was applied to five Elementary Schools in Malang. After that a survey was conducted by giving questionnaires to 25 students and five teachers. The analysis results of Electronic Student Worksheet based on Kvisof Flip Book Maker are illustrated in Table 2.

Table 2. The result of analysis electronic student worksheet.

No	Aspect	Score	Classification
1.	Content	70%	Good
2.	Cognitive Level HOTS	15%	Very Less
3.	Language	75%	Good
4.	Feature	50%	Moderate
5.	Utility	65%	Good

Based on Table 2, it shows that the Analysis of Electronic Student Worksheet 70% of content is in accordance with good classification. 85% cognitive level is still Low Order Thinking Skill (LOTS) at the C1-C3 level, meaning that the C4, C5, C6 levels are only 15% which are classified very less. Language suitability 75% of the languages used are appropriate with good classification. Features

(views) that are used 50% including enough categories. Utility aspect (usability) 65% means it is classified as sufficient.

Based on the Table 2, the content of Electronic Student Worksheet obtained 70% and classified as a good. In terms of cognitive level, 85% remained achieving Low Order Thinking Skill (LOTS) at the C1-C3 level. It means that the level of C4-C6 only obtained 15%, and it was classified as low. Then, the language aspect of the instructional media obtained a score of 75%. It further means that the language is appropriate and categorized as good. In terms of the feature, it obtained a score of 50% and it categorized as moderate. Then, in the aspect of utility, it obtained a score of 65%. It categorized as moderate.

3.2. Discussion

The development of Electronic Worksheet used Kvisoft Flip Book Maker application. The development of Worksheets in the form of electronic instructional media rather than the conventional one offers numerous benefits. Electronic Student Worksheets make it easy for readers to access digital content, have easier distribution and purchasing, uncomplicated backup process and storage, can be an alternative of monotonous printed books, offers two-way interaction technique. In addition, this instructional media can add multimedia easily, can be read on different devices, and it is adjustable in terms of size.

Roger Kaufman & Fenwick W. English defines needs analysis as a formal process to determine the distance or gap between actual outputs and impacts with the desired outputs and impacts, then place this sequence of gaps on a priority scale, then choose the more important things to solve the problem [13]. Based on the results of the analysis of the needs of Electronic Student Worksheet for Elementary School students in Malang, 70% of the content is found to be in accordance with good classification. The cognitive level is still 85% LOTS (in the C1-C3 level) meaning that the levels of C4, C5, C6 are only 15%. It further classified as poor classification. In terms of language, it obtained 75% and classified as good. The feature (display) obtained a score of 50% and classified as moderate. As for the utility, it obtained 65% and classified as sufficient. From the above results, it is known that the questions made in the Electronic Student Worksheet level should be improved at the C4, C5, and C6 levels in accordance with Minister of Education and Culture Regulation No. 61 of 2014 that teachers must conduct HOTS learning. This is in line with the results of research conducted by Ganish and Supraman who said students' critical thinking skills were still low. Teachers need learning models and teaching materials that can improve critical thinking skills. With Electronic Student Worksheet supporting the contextual teaching and learning model is considered necessary as a solution for teachers in training students to be independent, active and able to think critically so that students' learning outcomes will also increase [14]. Learners' skills in learning can be influenced by having an exercise using the effect of contextual interference which is referred to as motor learning studies [15]. This is also reinforced by the results of the analysis of the needs of Electronic Student Worksheet supporting the Problem Based Learning model which states that students' creative thinking abilities are still low, this indicates that so far the students are not familiar with the questions of creative thinking, so teachers need learning models and materials teaching that can improve the ability to think creatively [13]. Likewise with the results of Buy Riyadi's research which found that Electronic Student Worksheet based on inquiry as a result of the development was effective in growing HOTS of students [5].

Electronic Student Worksheet is said to be an effective instructional media that can be used in the learning process [16]. The results of the Electronic Student Worksheet analysis on students showed 80% stated that the methods provided were interesting and easy to understand [17]. Other research results also state that Electronic Student Worksheet is more interesting to use in the learning process, this makes the learning process of students in the good category. By using Electronic Student Worksheet, it can improve and train the critical thinking process [18]. But from the results of Leasa's research, et.al, there were still many teachers who had not used technology in learning [4] though students show an interest in ICT from the results of observations and interviews. According to Mahini

the teachers must have the skills, content, management learning to change the classroom and utilize technology [5]. The use of information and communication technology in learning can support and develop students' cognitive, affective and social cognitive skills even higher [19]. Electronic Student Worksheet is one solution in the enrichment of mastery of the material by students [20–22].

Based on the results of research on the development of multimedia-loaded Electronic Student Worksheet able to improve the cognitive abilities of students who meet the criteria such as the results of research conducted by Awe and Ende where the Electronic Student Worksheet development results obtained by the results of language expert trials an average score of 4.57 is in the category very good, the content test material average score of 4.33 is in the very good category, the learning design expert test the average score of 4.63 is in the very good category, multimedia expert test the average score is 4.86 there in the very good category, the highest score is in the attractiveness aspect, while the usability trial obtained an average score of 4.6 in the very good category. The results of the study concluded that the Electronic Student Worksheet developed was able to improve students' cognitive abilities as indicated by the average knowledge test scores from the obtained knowledge test scores of 82, 15 with mastery learning 91.30 [23].

4. Conclusion

The analysis results show that Electronic Student Worksheet developed is satisfactory in terms of content and language. However, in terms of the cognitive aspect, it still covered a Low Order Thinking Skills (LOTS). In addition, the user interface needs to be developed to create more attractive media. According to the results, it further recommends that an Electronic Student Worksheet on Thematic Learning Based on High Order Thinking Skills for both low and high classes needs to be developed. In addition, it is necessary to develop an Electronic Student Worksheet that has interesting features, more varied, not only using text and images, but also includes graphics, animation and video. Besides being useful for developing Higher Order Thinking Skills (HOTS) it also helps and motivates students in learning. The implication of this research is that an appropriate evaluation instrument will be able to develop higher-order thinking skills and foster student interest in learning.

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