E-Worksheet Using Kvisoft Flipbook: Science Process Skills And Student Attitudes

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E-Worksheet Using Kvisoft Flipbook: Science Process Skills And Student Attitudes

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Abstract: This paper presents research on laboratory-based e-worksheets using Kvisoft to see the science process skills and attitudes of chemistry education students. The e-worksheet was created with the stages of development, implementation, and evaluation adopted from the branch using 80 samples obtained from purposive sampling techniques. The aim is to look at science process skills and student attitudes after using e-worksheets on laboratory-based science process skills using the kvisoft application. The findings of this study are that e-worksheets using Kvisoft Flipbook can improve the science process skills and attitudes of chemistry education students.

Index Terms: Attitude, E-Worksheet, Kvisoft Flipbook, Science Process Skills

1. INTRODUCTION

Whether a nation is advanced or not can be judged from the education aspect of its nation's children. One effort to improve the quality of education in Indonesia is to improve the education system [1]; [2]. Some efforts to improve the quality of education include improvement of facilities and infrastructure, changes in curriculum, teaching and learning processes, improvement of teacher quality, improvement of the assessment system and other efforts that include the education component [3]; [4]. The development of science and technology creates a new paradigm in the world of education. This is directly proportional to effectiveness and efficiency during the learning and learning process. Especially in chemistry subjects according to [5] most require learning support tools. Most chemical materials require practicum to make students easier to understand the lessons taught. One of them is the subject matter of reaction rates, moreover, it is combined with appropriate learning methods such as problem-based learning that requires students to find solutions or answers to problems given during learning. Learning resources are all things that can facilitate students in obtaining a number of information, knowledge, experience, and skills in the teaching and learning process. The use of teaching materials in the learning process has benefits for students, among others, arousing motivation, developing creativity, arousing prior knowledge, encouraging the process of understanding, thinking and logical reasoning, communication and student interaction, and contributing to the development of different skills and acquisition of values students, as well as retention of desired knowledge, skills, and attitudes [6]. Attitudes are needed in learning activities because attitudes can help the learning process in achieving its goals [7]. Because of that attitude can develop knowledge and direct students in choosing what career in a career. Interest in continuing a career in chemistry cannot be separated from how much the individual has the belief that a career in chemistry is one of the desires for his future [8]. There are two attitudes in learning chemistry that determine one's success in learning chemistry, namely Positive and Negative attitudes [9]. Positive attitudes and negative attitudes arising in learning chemistry also vary for example such as students who are excited and have a high curiosity about chemistry subjects mean that students have a positive attitude in chemistry subjects. Good learning is related to the demonstration of a pleasant attitude in learning [10]. Therefore, the development of science and technology has led to a process of change in all aspects of life, including the world of education [11]; [12].

The need for services and opportunities for increased learning for students is a driver of the emergence of educational reform. Therefore, education reform must always be carried out by pursuing a learning process that is in line with the times by utilizing Information and Communication Technology (ICT). the use of information and communication technology in learning can support and develop students' skills both cognitive, affective and social skills of students, even higher skills [13]. So that the use of information technology in the learning process has become a necessity as well as a necessity. Law of the Republic of Indonesia Number 20 of 2003 concerning the national education system states that the learning process is a process of interaction between students and educators and learning resources in the learning environment. The development of science and technology creates a new paradigm in the world of education [14]; [15]. Most chemical materials require practicum to make students easier to understand the lessons taught. One of them is the subject matter of reaction rates, moreover it is combined with appropriate learning methods such as problem-based learning that requires students to find solutions or answers to problems given during learning one of which uses e-worksheets. E-Worksheet is one of the solutions in the enrichment of mastery of the material by students [16]; [17]; [18]. E-worksheets are also a means to help and facilitate teaching and learning activities so that effective interactions between students and teachers will be formed so that they can increase student activities in improving learning outcomes. In the e-worksheet, a breakdown of the material, assignments and exercises related to the material provided [19]. This effort aims to guide students to carry out various activities required. What's more now students are required to be more active in solving various subject matter questions being studied [20]. Doing practicum is one of the factors that influence student learning outcomes, and plays an important role in supporting the success of the learning process [21]. On the other hand [22] states that practicum can study material based on direct observation of the symptoms and scientific processes. Worksheets that have been used in the study of chemistry in the reaction rate material are work forms printed form. Teaching material like this is not optimal to meet the needs of students. Printed worksheets tend to be informative and unattractive that cannot display sound, video, animation, and images that can provide a clear explanation of the concept being conveyed. In the current technological development, most students are more interested in teaching materials that utilize other media such as computers / laptops, even smartphones compared to teaching materials in the form of printed worksheets [23].

Therefore, it is necessary to modify the print worksheet in the form of e-worksheets using one ICT product in the form of software or programs. In addition, the use of e-worksheets has the potential to change students' views to read and consume interactively and make it comfortable, where printed e-worksheets have images, narration, and graphics but e-worksheets can contain various features such as audio, music, animation, and video [24]. One of the software used in converting print worksheets in the form of e-worksheets in the form of a flipbook is the maker of the Kvisoft flipbook. Flipbook maker software application is one of the applications that support it as a learning medium that will help in the learning process because this application is not only fixated on writing but can be included in the animated motion, video, and audio that can make interactive learning media interesting so learning becomes not monotonous [25]. Therefore, this study aims to develop student activity sheets in the form of e-worksheets using the kvisoft flipbook application and know the ability of science processes and student attitudes in learning chemistry at the rate of reaction.

2 METHODOLOGY

There are 3 stages [26] in this research model, namely (1) Development, (2) Implementation, (3) Evaluation, which will be explained in more detail as follows: At the development stage, the student activity sheet on the available reaction rate material is then made into a Kvisoft-based software design rule. The e-worksheet development is validated by experts to test the validity of the product and the final result of the e-worksheet development process is the e-worksheet design that will be implemented in the next process. At the implementation stage, e-worksheets using the kvisoft application prepared are implemented simultaneously with its role and function as e-learning that can facilitate chemical learning in the reaction rate material in the hope that the system user can use it well and can increase students' understanding of the material reaction rate will be delivered. In addition, the use of Kvisoft-based e-worksheets can make it easier for students to use mobile-based and can be carried anywhere without having to bring printed student worksheets. The final result of the implementation process is solving problems in chemistry learning on the reaction rate material using student worksheets with the Kvisoft application that can help the learning process for students. In the evaluation phase, the process carried out is to look at the science process skills of students in the use of e-worksheets using the Kvisoft application using observation sheetsIn this study, there is content validity carried out in consultation with experts (Expert Validation Evaluation Criteria) in accordance with their fields. The validity test in this study involved media experts. The validity of the content can be seen from the suitability of the product with the demands of the curriculum [27]. With the evaluation criteria as in table 1 below.

Table 1. *Validation criteria*

Interval	Category
0.0 – 25.0	Very Inadequate
25.1 – 50.0	Not Feasible
50.1 – 75.0	Worthy
75.1 – 100.0	Very Decent

Construct validity, regarding the construct or structure and psychological characteristics of the aspects to be measured by the instrument. Does the construct explain differences in individual activities or behavior with respect to the aspect being measured. The sample used in this study were 80 students who were obtained by using a purposive sampling technique. Purposive sampling is to choose a sample based on certain criteria [28]; [29]. In this case the school criteria used are nationally accredited A. Data collection procedures in the first activity that must be carried out in the data collection process, namely creating an e-worksheet and resources framework, then entering all resources and the e-worksheet framework into the kvisoft application, after completion incorporated into the kvisoft application a validation test was conducted by experts to see the feasibility of the e-worksheet, after the expert validity test was completed and the results obtained were applied in learning to see students' science process skills in the reaction rate material then gave an attitude questionnaire to see the attitude of their students. To see the science process skills of students using observation sheets and questionnaires used to see students' attitudes, the two instruments were made using a Likert scale of 4 (four) for positive statements Very Not Good has a score of 1, Not Good to have a score of 2, Good to have a score 3 and Very Good for 4. For negative statements Very good to have a score of 4, Not good to have a score of 3, good to have a score of 2 and Very good to have a score of 1. And the category can be seen in table 2.

Table 2. *Category Science Process Student Skills and student attitudes*

.	Category
0.0 – 25.0	Very Not Good
25.1 – 50.0	Not Good
50.1 – 75.0	Good
75.1 – 100.0	Very Good

Data obtained through observation sheets were analyzed using inferential statistics with t test (Independent sample t-test) with the help of SPSS 21 computer program. While perception questionnaire data were analyzed using descriptive statistics assisted by the SPSS 21 computer program.

3 RESULTS AND DISCUSSION

The results of the study conducted by this researcher are modifications to the activity sheet based on science process skills on the reaction rate material using the kvisoft flipbook application. In Indonesia, especially in the learning activities carried out, usually using printed activity sheets, therefore, the researchers made an innovation by making electronic activity sheets based on Kvisoft's flip-book books that were used on students who were studying reaction rate material. Therefore, the renewal in this study is the change of printed teaching materials into Kvisoft flipbook-based electronics. This e-worksheet contains subject matter, work procedures, and assessment formats which are all based on science process skills to be able to train or develop students' science process skillsLearning activities are designed so that students can actively build concepts, laws or principles through the stages of formulating a problem, making a background, constructing a hypothesis, testing a hypothesis, analyzing data, drawing conclusions and communicating results. During the learning activities taking place, of course all students need learning resources as a tool that is used as a source of learning information. Teaching materials have various types consisting of printed and non-printed teaching materials. Printed teaching materials consist of books, leaflets, and modules.

Along with advances in information technology, teaching materials used in the learning process also develop and innovate for the advancement of education. One of the beneficiaries of information technology is the world of education. The e-Learning process can be defined as a teaching-learning process through support for information and communication technology (ICT) [30]. The use of e-learning as a teaching and learning tool is now rapidly developing into education, with thousands of courses offered by educational institutions [31]. Education uses information technology as a learning medium, and increases the capacity of lecturers and students to improve the quality of education. The types of learning resources that are most commonly used are: E-journals, E-books, E-modules, aggregate text databases, indexing and abstract databases, reference databases (biographies, dictionaries, directories, encyclopedias, etc.) , Numerical and statistical database, images, and audio-visual resources [32]. All of these resources are advantages, when you come to learning and teaching activities [33]. The use of information technology is one important factor that allows the speed of transformation of knowledge to students. Research by utilizing information and communication technology, one of which is the development of printed teaching materials into electronic-based worksheets, better known as e-worksheets. The final form of e-worksheets using the modified Kvisoft application is as follows.

Figure 1. *Initial page of the e-worksheet on the reaction rate material*

Figure 1 is the starting page of the e-worksheet on the reaction rate material using the Kvisoft Flipbook.

Figure 2. *Table of contents and instructions for using e-worksheet*

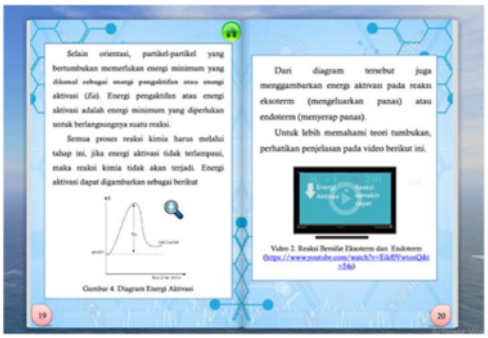

Figure 3. *The material page of the reaction rate*

Figure 4. *Practicum Activity page*

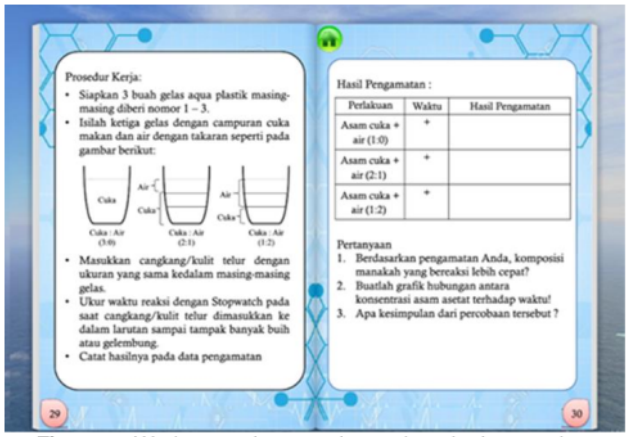

Figure 5. *Work procedures and questions in the practicum*

The activity sheet based on the science process skills supported by the kvisoft flipbook is validated beforehand to the experts. The results can be seen in table 3.

Table 3*. Results from expert validation of e-worksheets*

No	Aspect	Feasibility Level	Category
1	Theory	87.3	
2	Display	89.6	Very Decent
3	Language	88.5	

From the results of the validation carried out by experts, it was found that the very feasible category for the material aspect with a level of eligibility was 87.3, the display aspect was 89.6 with a very decent category and the language aspect had a level of eligibility. 88.5, which means it's very feasible. Therefore, based on the results of the validation carried out by experts, it can be concluded that e-worksheets using the Kvisoft Flipbook are very feasible and good to use. After e-worksheets use the modified Kvisoft application, e-worksheets are implemented in a small group of students in chemical learning on reaction rate material to see students' science process skills about kvisoft-based e-worksheets. Practical activities are more effective in encouraging students from acquiring science process skills [34]. The following are the results of students' science process skills analyzed using descriptive statistics shown in table 4.

Table 4*. Results of students' science process skills on reaction rate material using a kvisoft flipbook-based e-worksheet*

	Aspect	Score	Category	N
Class Experiment	Asking Questions or Formulating problems	89.6	Very Good	40
	Make a research background or make observations	76.61	Very Good	40
	Construct a hypothesis	81.79	Very Good	40
	Test hypotheses through experiments	72.35	Good	40
	Analyze data and make conclusions	75.87	Very Good	40
	Communicating Results	75.56	Very Good	40
Class Control	Asking Questions or Formulating problems	72.52	Good	40
	Make a research background or make observations	71.61	Good	40
	Construct a hypothesis	70.79	Good	40
	Test hypotheses through experiments	69.35	Good	40
	Analyze data and make conclusions	68.87	Good	40
	Communicating Results	71.56	Good	40

We can see in table 4, we get very different results between the control class and the experimental class, this is because the experimental class has used a kvisoft flipbook-based e-worksheet on the reaction rate material, whereas in the control class, it uses the usual print activity sheet. From the two classes, we can see that the most dominant aspect is the aspect of making a research background. This is because in the aspect of making background research or observing the experimental class increases with a very good level of achievement, while the control class is good. The high level of achievement in the experimental class is due to the fact that in the e-worksheet the students are provided with examples of observing steps. This is in accordance with the worksheets designed by [35] as a practical, flexible and educative web-based learning media. This also underlies that the aspect of constructing the hypothesis of the experimental class is higher than that of the control class, this is because the e-worksheet experiment provides indicators in predicting temporary answers. Science process skills are thought to provide students with meaningful learning experiences because they help students to achieve higher-order thinking and critical thinking [36]. Where critical thinking is the initial foundation for the development of creative thinking [37]. Mastering science process skills enables students to acquire the skills needed to solve everyday problems [38]. Science process skills are thinking skills that are used to process information, solve problems, and form conclusions [39]. Science process skills are the drivers of the discovery and development of facts and concepts as well as the growth and development of attitudes and values [40]. The importance of mastering science process skills by students can facilitate students in understanding abstract concepts if they learn through concrete objects and are carried out by students themselves through direct learning experiences. Learning through experience can be done directly through practical activities [37]. The attitude of students using electronic worksheetsThe results of student attitudes when using e-worksheets can be seen in the following table 5.

Table 5. *Student attitudes in using e-worksheets*

Classification				%	Mean	Min	Max
	Interval	Category	Total				
Class Experiment	25.0 – 43.7	Very Not Good	0	0.0	72.5	47	96
	43.8 – 62.5	Not Good	7	17.5			
	62.6 – 81.2	Good	23	57.5			
	81.3 – 100.0	Very Good	10	25.0			

	Total		40	100			
Class Control	25.0 – 43.7	Very Not Good	10	25.0	56.5	26	92
	43.8 – 62.5	Not Good	20	50.0			
	62.6 – 81.2	Good	7	17.5			
	81.3 – 100.0	Very Good	3	7.5			
	Total		40	100			

From table 5, we can see that the experimental class has a good attitude compared to the control class, this is because in the experimental class using kvisoft-based e-worksheets. Because positive student attitudes in learning will foster and develop interest in learning, will be easier to be motivated, and will more easily absorb the subject matter being taught [10]. Especially when given learning that makes students more interested than usual.

Table 6. *Independent sample t-test for student attitudes*

	T	df	Mean	Std.Deviation	95% confidence interval	
					Lower	Upper
Student Attitude in e-worksheet	16.224	80	3.0906	.24321	18.234	.6120
	16.224	96.067	2.2033	.30015	17.985	.8615

From table 6 it can be seen that the value of t is obtained (tcount) with the value of ttable. T table values can be found in table 6 statistics at the significance of 0.025 (2-tailed test) with a degree of freedom (df) 80. In this study the results for the table were 1.98525. Whereas the value of tcount can be seen in table 6. (column t) which is 16.224. The hypothesis testing criteria is that the t-value is greater than the t-value, there is a rejection of H0 [41]. So, it can be concluded that there is a significant difference in students' attitudes between chemistry education students who use Kvisoft-based e-worksheets and not on the reaction rate material. It can be seen from table 6 that the average value of student attitudes is 3.0906, which means that the use of e-worksheets can increase student attitudes.

Table 7*. Independent sample t-test for students' process skills*

	T	df	Mean	Std.Deviation	95% confidence interval	
					Lower	Upper
Science Pocessng Skills in e-worksheet	16.724	80	3.1906	.24321	18.234	.6120
	16.724	96.067	2.3033	.30015	17.985	.8615

From table 7 it can be seen that the value of t is obtained (tcount) with the value of table. T table values can be found in table 7 statistics at the significance of 0.025 (2-tailed test) with a degree of freedom (df) 80. In this study, the results for the table were 1.98525. As for the tcount, it can be seen in Table 7. (column t) which is 16,724. The hypothesis testing criteria is that the t-value is greater than the t-value, there is a rejection of H0 [41]. So, it can be concluded that there are significant differences in the mastery of science process skills between chemistry education students who use Kvisoft-based e-worksheets and do not use reaction rate material activity sheets. It can be seen from Table 7 that the average value of students 'science process skills is 3.1906, which means that the use of e-worksheets can train students' science process skills. Based on data obtained from the implementation of e-worksheets based on science process skills, it can be seen that the use of e-worksheets is effective in training students' science process skills. This is based on e-worksheets that are part of e-learning, where the use of e-learning in learning makes the learning process sustainable. Besides that E-learning is a solution in offering a variety of possibilities for social networking so that in this way the teacher can keep various records of student interactions in collaborative learning [42]; [43]; [44]. And students are motivated to learn in class because of the comfortable laboratory space that makes students excited to go to the laboratory [46]; [47].

4 CONCLUSION

The results of this study can be seen that the e-worksheet of reaction rate material using students' kvisoft applications on the ability of students to process science is in the very good category, this is because e-worksheet is more interesting in conducting chemistry learning activities of reaction rate material. This also makes students' science process skills in the good category. With e-worksheets using the Kvisoft application can improve and train students' science process skills.

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