E-book Needs Assessment as a Learning Resource On The Topic of Matter Classification in Junior High School

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Abstract. *This study aims to analyze the needs of e-books as a learning resource, on the topic of matter classification in Junior High School. This study used a survey method involving 6 science teachers and 85 students in class IX as respondents. Research data was collected using a questionnaire consisting of six questions for teachers and seven questions for students, which included: learning resources used, e-book usage, appearance, layout, and e-book content. The results showed that: 1) 84% of teachers and 94% of students used textbooks for learning material classification, and only 38% used e-books; 2) Students state that they have difficulty understanding the matter classification that is abstract in nature, so students need learning resources that can represent the matter to be more concrete; 3) In general, all respondents revealed that they wanted an e-book that could be interesting with interactions equipped with various representations to help understand the topic of matter classification.*

I. Introduction

The development of increasingly advanced technology and information has supported changes to the book format. E-books are defined as books that are converted in electronic or digital form [1,2]. The learning process supported by the use of e-books makes students more active [3, 4]. Some of the advantages of e-books are that they have a small physical size, so they can be stored on a hard drive, CD or flashdisk; easy to carry; easy to process, easy to use, easy to duplicate; and easy to distribute; and supports greening (paperless) [5]. In addition, e-books can be accessed online and are low in cost [6]. The government, through the Ministry of Education and Culture (Kemendikbud) has facilitated teachers and students by publishing teaching books for students and teachers to support the learning process which can be downloaded for free on the Ministry of Education and Culture's official website. E-books for learning that are commonly used are informative e-books, but there are also e-books that are interactive and informative. Interactive e-book, which is an e-book that can integrate sound, image, animation and video visualization that enables student interaction with learning resources, so that e-books like this are expected to support the process and evaluation of student learning to be more effective [7, 8, 9].

The various explanations above show the importance of using e-books in the learning process at school. Several studies on the development of e-books have been carried out. Astuti, Hidayat and Kusairi [10] and Sari, Fadiawati, and Tania [11] reported the results of the effectiveness test of chemical representation-based interactive e-books in improving students' understanding of the results that learning outcomes after learning using a representation-based interactive e-book had a flat high-category n-gain. In addition, interactive e-books can minimize misconceptions of a concept, and can enhance learning activities and foster students' critical thinking skills [12, 13, 14, 15].

One of the science materials in grade IX is the classification of material, namely material that is abstract, where students are required to understand atoms, ions and molecules, so students experience difficulty learning independently [16]. Regarding abstract concepts, it takes the media to visualize them with various representations that can combine abstract objects to be a little more concrete [17, 18]. The results of the study by Aminudin, Fadiawati and Tania stated that chemical representation is very suitable for use in learning classification material that can help students understand abstract concepts to be more concrete. Chemical representations consist of three levels, namely: macroscopic, submicroscopic, and symbolic [19, 20, 21]. Furthermore, Johnstone explained that macroscopic level is a real and visible, submicroscopic level is based on real observations but still requires theory to explain what happens at the molecular level and uses representations of theoretical models, and symbolic levels are representations of reality, can be image, symbol or formula.

Based on the results of previous research that has been done, it will be the basis of research to find out the views about the use of interactive e-books based on chemical representations in the learning process on the topic matter classification. This research will be conducted on science teachers and Junior High School students. The purpose of this study was to analyze the needs of e-books as a learning resource for studying matter classification.

II. Method

This study uses a survey method. The subjects in this study were 85 students in grade IX and 6 science teachers obtained by probability sampling techniques at SMPN 1, SMPN 2, and SMPN 4 Metro. Data collection uses questionnaire techniques and interviews. The instruments used were questionnaire instruments, interview guidelines, and self checklist.

The questionnaire consists of 7 questions for students and 6 questions for teachers with several answer choices regarding the learning resources used, if using an e-book then how are the characteristics of the e-book used. After the teacher and student respondents have finished answering the questionnaire, then the teacher respondent is interviewed about the questionnaire that has been filled. After that, the data will be analyzed to calculate the percentage of respondents' answers. The results of teacher and student responses obtained data to be analyzed to calculate the percentage of respondents' answers. The percentage is obtained by tabulating the data, then calculating the percentage of respondents' answers for each item with the following formula [22]:

$$\% J_i = \frac{\sum J_i}{\sum N} \; x \; 100\%$$

Where% J_i is the percentage of choice answer-i, $\sum J_i$ is the number of respondents who answer the answer-i, and $\sum N$ is the number of all respondents.

III. Result and Discussion

The results of data analysis showed that 66.7% of teacher respondents did not use e-books in science learning activities. Teachers only use printed books from publishers provided at school and also use homemade teaching materials. Only 33.3% of teacher respondents have used e-books obtained from the results of downloading through websites on the internet. The e-book used does not have animations, videos, and sufficient interaction space between students and the e-book used. Therefore, the e-book used is not an interactive e-book, but rather an informative e-book but the e-book used is already evaluating the lessons and is in accordance with the applicable curriculum. All teachers interviewed stated that they had never made an e-book. Only 33% of teachers claimed to know about chemical representation.

Table 1. Percentage of teacher responses to ebook on matter classification

Questions	Teachers	
	Yes	No
Use of e-book on learning classification of matter	33.3 %	66.7 %
Suitability of e-book content with the curriculum	100 %	-
The existence of animation, video and enough space to interact on the e-book used	-	100 %
The existence of evaluation instrument on the e-book used	100 %	-
Knowledge about chemical representation	33 %	67 %
Ever made an e-book	-	100 %

Based on the results of interviews with teacher respondents, some did not use e-books because they were used to using learning resources provided by the school. All teacher respondents stated that they had never made an e-book because of the limited time and knowledge about IT and lack of motivation. All respondents expect the availability of interactive e-books that have evaluation instruments, interesting images and animations, communicative languages and interaction spaces between e-books and students. Some respondents claimed to know about chemical representation, but could not explain the purpose of chemical representation which was divided into three levels including macroscopic, symbolic, and submicroscopic. All respondents stated that the use of interactive e-books can be used as additional learning resources that can improve mastery of students' concepts in the learning process, so it is hoped that with chemical representation-based interactive e-books can visualize them with various representations that can combine abstract concepts on topics of matter classification to be more concrete [17, 18] for Junior High School students easy to understand.

Table 2. Percentage of student responses to ebook on matter classification

Questions	Students	
	Yes	No
Use of e-book on learning classification of matter	38 %	62 %
Difficulty understanding classification of matter	71 %	29 %
the existence a clear picture of matter classification (atom, ion, molecule) on the e-	32 %	68 %

book used		
The existence of evaluation on the e-book used	68 %	32 %
The e-book used has an attractive cover	42 %	25 %
The e-book used contains images that motivate to read	29 %	38 %
The e-book used has an attractive design appearance	6 %	62 %
e-books used use communicative language	41 %	27 %

Based on Table 2. it is known that 38% of students have used e-books to learn matter classification, and others use learning resources in the form of textbooks from certain publishers, student worksheets, and also use websites on the internet. 68% of the students who used the e-book in the material classification study stated that the e-book was not accompanied by interesting images or animations that could help learning clearly, because the e-book used was in the form of a digital book in pdf format which was informative e-book. As many as 38% of student respondents claimed that the e-book used did not contain images that could motivate students to read and the e-book used had an unattractive appearance. Then as many as 71% of students have difficulty in studying the classification of material, the difficulties experienced by student respondents are difficult to understand the language in a textbook, this is in accordance with Fauziah's statement [16]. In addition, it is difficult to understand symbols in a textbook. All student respondents stated the need for the development of interactive e-books, especially on the topic matter classification. They hope the e-book that will be developed contains an attractive display, interesting images and animations, communicative languages, the existence of interaction spaces and interactive evaluation questions.

IV. Conclusion
The result of the study will be used as a basis for developing interactive e-book on the topic matter classification based on chemical representation. All respondents stated they need for interactive e-book development, especially in classification material. They expect the e-book to be developed later to contain an attractive display, interesting images and animations, communicative language, the existence of interaction spaces and interactive evaluation questions

Acknowledgments

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