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APPROPRIATENESS OF POCKETBOOK (HANDOUT) USING BARCODE THEMED ENVIRONMENTAL POLLUTION TO TRAIN THE DIGITAL LITERATION OF VII JUNIOR HIGH SCHOOL

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Abstract

This study aims to describe the validity of a pocketbook (handout) using the barcode in environmental pollution to train the digital literacy for seventh-grade junior high school student. The feasibility of reviewed based on three aspects, that are validity, practicality, and effectiveness. The validity aspect is through the validation of two science lecturers and a science teacher. The practicality aspect is through the observation method of learning implementation and the student questionnaire response method. The effectiveness aspect with pretest-posstest based on digital literacy. The result of pocketbook (handout) using barcode validation show a very good category with 5 tendencies. The practical aspects of the learning process showed very good results for each meeting, while overall student response show of 97.5% with a category very good. The effectiveness in training digital literacy is through increasing N-Gain each student and every indicator of digital literacy. Relatively the average score of students in the pre-test was 39.06 while the post-test was 85.31 with N-Gain 0.66 in the medium category. The conclusion of this research produces a pocketbook (handout) using barcode feasible to train students' digital literacy on environmental pollution material.

Keywords: *pocket books, handouts, digital literacy.*

INTRODUCTION

Information technology and communication (ICT) in this era have contributed greatly to all aspects of human life, including education (Budiana, 2015). Generally, students in middle school have aged 13-15 years and at that age, they are very close using the internet (Samiudin, 2017). The Indonesian Internet Service Users Association (APJII) research in 2018 found that internet usage in Indonesia reached 264,8 million users with penetration of 64,8%. The penetration is the number of internet users divided by the population in one country. The detail data from AJII that aged 10-14 years, 66,2% and aged 15-19 years, 91% also a student in junior high school have a high penetration of 80,4% (APJII, 2018). Everyday internet users can spend an average of 8 hours 36 minutes to play a device with a frequency of 79%. Based on these studies the technology is essential to human life.This has an impact on student learning styles that need quick and easy information through digital media. Indonesia should be in line with the digital condition and the development of literate culture needs to be improved. Based on these facts, the students need to introduced digital literacy.

Digital literacy in Kaeophanuek (2018) is not only reading information through the digital but skills in understanding and using information that is easily accessed through supporting devices such as computers or other devices. The magazine published by the Ministry of Education and Culture states the digital literacy is not only about skill in technology, but a good and correct ethical way to develop Indonesian education (Kemendikbud, 2017b). The Minister of Communication and Information Rudiantara in the daily news entitled "Digital Literacy Required to Enter the Curriculum" stated that he supports the national digital literacy movement because internet users continue to grow while internet knowledge is positively slow (Randi, 2011). Students currently tend to live and depend on technology (internet), so digital literacy needs for students to achieve the curriculum (Nelson, 2011).

The purpose of the 2013 curriculum appliance encourages. In 2016 the Ministry of Culture and Education of the Republic of Indonesia held a National Literacy Movement (GLN), this content to realize the world of national literacy throughout Indonesia. Literacy is divided into 6 types namely; numeracy literacy, reading and citizenship literacy, science literacy, cultural

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literacy, financial literacy and digital literacy (Kemendikbud, 2017a). Digital literacy has 4 competencies, namely searching information, hyperlink and hypertext, content evaluation and the last is knowledge assembly (A'Yuni, 2015). Many ways to practice digital literacy, for example, is a pocketbook with a barcode. The pocketbook is a small book can be put in a pocket so it's easy to carry anywhere. The pocketbook is equipped with a barcode that contains certain types of codes or information data.

Ami (2012) asserts that the utilize of pocketbooks as a learning tool is beneficial hence the pocketbook can be accessed everywhere and every time, only needed each personal device. Oktiana's research (2015) states that 93% of students stated an android-based pocketbook was very interesting if applied in learning also encourage students' curiosity and motivation. Further research conducted by Indhaka (2016) states that the use of an android pocketbook on physics subjects very well with an average posttest of 80 and n-gain 0,34 with medium criteria. Research by Vernanda and Hidayanti (2019) states that digital literacy is trained using digital books (e-pub format) can train as much as 3.78 digital literacy with high student interest. The use of pocketbook (handout) with a barcode in it is expected to train the students' digital abilities on how to access technology to apprehend the subject. Students learned how to search for information on the internet and used hyperlink, hypertext and more by using the pocketbook.

Environmental pollution is a basic competency demands 3.8, viz the analysis of environmental pollution and the effect to the ecosystem plus 4.8 writes about the idea of solving pollution problems in the environment based on observations. Environmental pollution has turned out to be the most studied issue in various worldwide internet pages, included what happens in Indonesia. As an example, BPS noted that in 2016 Indonesia produced 65.2 million tons of waste annually, with a population of 261.1 million people. Besides, BPS in 2018 recorded 1643 villages experiencing water pollution, 164 villages contaminating land, and 1174 air pollution villages (BPS Indonesia, 2018). The large number of cases that occur in Indonesia due to environmental pollution can be can be the right choice to practice digital literacy.

METODE

QUESTIONNAIRE ITEM

The questionnaire to know validity of pocket book using barcode based on aspects of presentation, content and material (BSNP, 2014). Validator are lecturer and science teacher that give score 1-5 **Table 1.** If the pocket book using barcode has a valid tendency (validator score ≤4) is interpreted according to the following category:

Table 1. Linkert scale of pocket book validity

Scale	Category
1	Very poor
2	Poor
3	Sufficiently
4	Good
5	Very good

(Adapted from Riduwan, 2016)

The questionnaire to know practicality studies through student responses and the feasibility of learning. The student give response by giving yes or no answers, then the results are interpreted in **Table 2.** The implementation of learning is seen through observers' observations by giving yes or no answers. If the positive responses of students and learning achievement ≥ 61% is declared good if the percentage.

Table 2. Criteria for Interpretation of Student Response and feasibility learning

Score Range	Category
0-20	Very poor
21-40	Poor
41-60	Sufficiently
61-80	Good
81-100	Very good

(Adapted from Riduwan, 2016)

DIGITAL LITERACY TEST

The second method is a digital literacy test that used the One Group Pretest-Posttest Design method with 20 students at MTs Negeri Bangkalan.

Prestest		Treatment		*Posttest*
O_1	→	X	→	O_2

Picture 1. Experiment Design

The improvement of Student's digital literacy through providing pretest and post-test can be measured by using n-gain formulla as follows:

$$(ng) = \frac{T_2 - T_1}{I_s - T_{1\,h}}$$

(ng) : *Gain score*
T_1 : *Pre-Test Score*
T_2 : *Prost-TestScore*
I_s : Maximum Score

Then the normalized gain is interpreted according to the following criteria:

Table 2. Gain Score Criteria

Range	Criteria
g > 0,7	High
0,3 < g ≤ 0,7	Medium
0,1 < g ≤ 0,3	Low
g ≤ 0,1	Very Low

(Hake, 1999)

The digital literacy of student was declared to be effective if the result a gain score of > 0.3 with medium or high criteria (Hake, 1999).

RESULT AND DISCUSSION

VALIDITY

Based on research the data obtained from the pocket book:

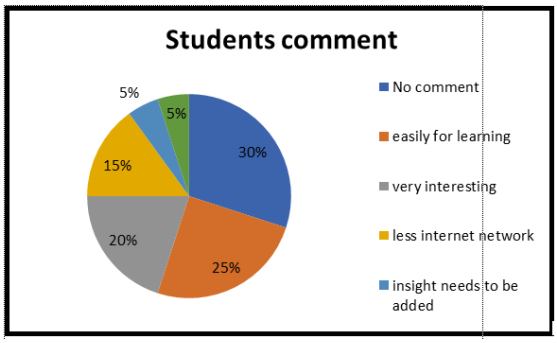
Table 3. Recapitulation of pocket book validity

Validation aspects	Pocket book	*Handout* on pocket book
Content	Very valid	Very valid
Presentation	valid	Very valid
Languange	valid	Very valid
Digital literacy	-	Very valid

The pocketbook is feasible based on the National Education Standards Agency (BSNP, 2014). The language aspect in the pocketbook is valid because it contains formal sentences. Wicaksono (2016) states, good and clear language helps students in learning, this is because language is a communicating tool in learning so that the required competencies can be achieved. Only handouts have digital literacy competencies because students can easily use existing features and access the internet directly. A pocketbook only provides a literacy tree (introduction to digital literacy). Buzetto (2017) states that in digital learning requires hyperlinks, searching skills, multimedia. This important component has been presented in a barcode-assisted handout so it is suitable for use.

PRACTICALITY

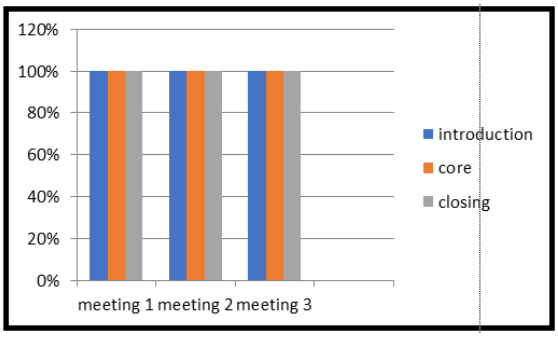
Practicality based on student responses through a questionnaire with 10 statements related to pocketbook using barcode. The student responses with an average of 97.5%, meaning that the products developed are categorized as very good. Not only that, filling out the comment column becomes the support of the existing response data and is presented in the form of the following pie chart.



Picture 2. Comment on student responses

Almost all students said that the pocketbook is easy to learning and interesting. This is supported by the daily learning students who always use unit activity (printed handouts of each material, where students fill in answers) so they feel attracted by the pocket book. Buzetto et al (2017) state that students are now more comfortable using their computer tools (devices) to find out more information than text print.

The learning implementation was observed by three observers in each phase, namely introduction, core and closing is presented in the form of the following diagram.



Picture.3 implementation of learning

Sciences approach in environmental pollution have been carried out well. The students observe a video through a barcode on a pocket book which then asks. The process of trying students to use the features in the handout, such as finding out, let's study, let's try and more. Students worksheet based on digital literacy for Fulfilling KD 3 (analyzing causes and impacts environmental pollution) as analyzing. Finally, students present in front of the class as the final of the science approach.

Unfortunately there are still students feel difficult to use using the barcodes that unfamiliar with it so teacher need to explain again in procedure like how to download barcodes, use a pocket book in detail. Overall students interesting because they can click the link and connect directly to the internet, also able make keywords in search engine and estimate valid in sources information. Students also learn how to make citation. Arsyad (2016) states, that internet make it easy for students to learn, because it will be wider in scope than reading books. The internet able to use multimedia (video, text, pictures) so the students become conducive.

EFFECTIVENESS

The digital literacy test about environmental pollution problems and students must search the answers on the internet including a history search engine and references used as assessment material in digital literacy. Acquisition of N-Gain based on four competencies in digital literacy has been summarized by A'yuni (2015), namely searching information, hypertext and hyperlink, content evaluation and knowledge assembly. Increased for each of the digital literacy competencies can be seen in the table below.

Table 3. Percentage of Increase in Digital Literacy Viewed from Each Competency

Digital Literacy Competencies	*Pretest*	*Posttest*	N-Gain	Category
Searching Information	46,25%	90%	0,62	Medium
Hyperlink and	50%	72,5%	0,32	Medium

Digital Literacy Competencies	*Pretest*	*Posttest*	N-Gain	Category
Hypertext				
Content Evaluation	35%	95%	0,85	High
Knowledge Assembly	25%	83,95%	0,84	High

According to table 3, the first and second competencies are classified as medium. Searching information contains the ability of students to create keywords when searching for information in a search engine and the diversity of information sources used. N-Gain results for searching information show the students are good at finding information because today do some brow using a search engine is not new for students. it is supported by Hootsuite (2019) states that the digital behavior of Indonesians is high where google.com or google.id is the top sites people always visit every time.

In the second competency is hyperlink and hypertext. Unfortunately, not all students include valid data in the answer and almost all answer is general data. Like the amount of waste that is disposed of every day, not specific as pollutants that pollute the environment. The students lacked an understanding of the functions of hyperlinks and hypertext or how to explore deeper when doing literate. APJII (2019) explained the results of a survey that junior high school was the number of high penetration of 80.4% with use devices every day reaching 93.3%. This data show, not all internet activities are carried out in student because the majority of internet users used of social media so some students will difficult to determine sites or data that are appropriate for instructions on test questions.

The highest increase was obtained by two other competencies, namely content evaluation, and knowledge assembly. In evaluating content students sorted out information that is complete and valid then makes references according to the guidelines. These results are supported by digital literacy tips in the handout introduced by teachers to students such as to introduce various domains on websites, how to find legitimate sites and introduce journal search engines. The last competence is knowledge assembly, the students compiled information that uses their language. Students can perform at this stage on the pretest and posttest, but in a pretest, some students do not reach this competence because of a lack of time management.

Overall, not all students have a high increase in digital literacy, because in environmental pollution there are only 3 meetings and digital literacy is a skill. Redhana (2019) states that develop a skill needs a conscious and systematic effort because skill is not something that is obtained from birth but is continuously honed.

Teachers should continue to hone students' abilities in digital literacy because now is a digital era and students should exploit the technology in learning. Another benefit is to broaden students' insights and knowledge both in school and out of school, also another benefit to minimize false / hoax information. Based on relevant theory and research, as well as an improvement of digital literacy after using pocketbook (handout) using a barcode, it can be concluded that The pocketbook (handout) using a barcode is effective to improve students digital literacy in environmental pollution.

CONCLUSION

The pocketbook (handout) using barcode in environmental pollution was declared feasible based on three aspects. In the validity of the product developed tendency 5 with a very valid category. In the effectiveness, the N-gain obtained 0.66 in the medium category. In practicality, the response of students is very good with a percentage of 93.3% and the implementation of learning is very good.

RECOMMENDATION

Based on the research in pocketbook (handout) using a barcode in the environmental pollution to train digital literacy of grade VII middle school students, several recommendations are found to become crucial information for the succeeding pocketbook research with different themes, provide internet access to students in literacy to ease students get the information, get used to make references each task.

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