Development of Problem-Based Learning (PBL)-Based Digital Books (E-Books): Public Administration at SMK NU Lamongan

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ABSTRACT

This paper discusses the e-book development process based on Problem-based Learning in public administration learning material, produces and tests product feasibility, and finds out students' responses to e-book development. The type of research is RnD (Research and Development) with IDI procedural type method (Instructional, Development, Institute), which consists of three stages, namely define, develop, and evaluation stages. Research data are e-book development and e-book quality acquisition through validation sheets and students' questionnaire responses. The product validation stage is carried out by design experts, material experts, and linguists by giving a score of 0-100 while the students' questionnaire responses are interviews. The average of assessment results from validation sheets by design experts is 73,25%, which means valid and feasible. The average score of material experts is 83,12%, which means valid and feasible. The average score from linguists is 92,25%, which means very feasible. Thus, the final score of the three validations is 84,3%. It can be concluded that the use of e-books is valid and feasible. It is reinforced by the results of the students' questionnaire response questionnaire results indicated an average score of 93.5%, which means that the digital book is valid and feasible to use.

Keywords: problem-based learning, e-book, vocational high school public administration

INTRODUCTION

The teaching and learning process can determine the output produced by students. The learning process for students who have intellectual advantages needs to be organized and designed in such a way that it can facilitate learning optimization. It is necessary to create a learning process that allows for character, social, intellectual, emotional and personality development. So as to be able to balance all these aspects with progress and development (Dalyono, 2005). The learning model consists of two types, namely the traditional model which is teacher-centered and the constrictivist learning model which is centered on activities focused on students. The traditional teacher-centered learning model can take the form of lectures, presentations, direct teacher instructions and also concept teaching. Meanwhile, the constructivist learning model emphasizes students' personal behavior in thinking, statements and other problem-based instructions, finding solutions and class group discussions. This constructivist learning focuses on the active process of students who contribute directly where students can discover existing problems and relate them to their daily lives. Problem based learning is a constructivist learning model, where the group work process is able to optimize students' abilities so that they can empower, develop students' thinking skills, hone and test continuously (Amir, 2009).

SMK NU Lamongan is one of the private vocational high schools in Lamongan. When conducting school observations, SMK NU Lamongan was one of the schools that lacked teaching materials and handbooks for students and teachers, which was explained by the Principal. Based on an interview with the class In contrast to other subjects, the average student pays little attention when the teacher explains General Administration material. This was expressed by the general administration subject teacher, where many students slept and were busy. During the General Administration learning process, students tend to be less active during the teaching and learning process. This is because teachers still use the traditional learning model in the form of lectures when conducting online learning via Zoom and Google Meet, apart from that

the teacher also only provides material in the form of PowerPoint and only in the form of reading when learning is done via Google Classroom and there is no learning innovation so that students there is no ambition in learning and students' interest in reading is decreasing.

The problem currently faced by teachers, especially at SMK NU Lamongan, is the difficulty of finding handbooks for teachers and students so that students do not have guidelines in the form of supporting books or LKS (Student Worksheets). During the Covid 19 pandemic, the learning process was carried out online. The online learning process makes it more difficult for students to understand the material if they don't have books to support their learning. The increasing development of technology means that students and teachers must also be ready to face the development of a new world that makes more use of existing technology. This also requires someone to have a smartphone or gadget in order to be able to use current learning technology facilities (Ghosh, 2016). Apart from that, in the current online learning process, teachers lack digital teaching materials so teachers have to create independently each material that will be taught at the meeting. Therefore, textbooks in the form of digital books based on Problem Based Learning will really help the online learning process at this time, especially to make students more active and pay attention to the learning process.

Learning according to Skinner's view is a behavior (Dimyanti & Mudjiono, 2013). Learning makes a person have an active response to the environment and events around him. To obtain a good response from students in the learning process, teachers should create a positive learning atmosphere in the classroom. According to (Sugihartono & et al, 2007) learning is an effort to gain knowledge and experience in the form of permanent changes in behavior and abilities caused by interactions between individuals. Learning has an impact on development in the cognitive, affective and psychomotor domains which can be seen in changes in knowledge, attitudes, values and skills. Learning according to Nana Sudjana (2000) quoted by (Sugihartono & et al, 2007) is a deliberate effort made by educators which can cause students to carry out learning activities.

Based on the opinions of the experts above regarding learning, it can be concluded that learning is a deliberate effort made by educators to change students' behavior in a better direction by using learning patterns. Teaching materials are all learning materials that help educators in the learning process and all materials that are combined from various sources for the learning process (Prastowo, 2015).

E-books are a combination of two things to produce and deliver material using a book design application on a laptop or cellphone (Arsyad, 2011). E-books are one of the learning innovations in the digital era that make it easier for teachers and students in the teaching and learning process, the ease of access which can be done offline will make it easier for students not to carry books which can be said to be quite heavy to carry everywhere. E-books are useful for preserving book literacy, which are relatively large in number, do not rot, and are long-lasting because they are stored in file form, apart from that, e-books are also easy to use anytime and anywhere/portable (Wati, 2016). The benefits of e-books themselves are (1) clarifying a message by adding an icon that can help students understand the material, (2) being able to overcome limitations of space, time and sensory skills, (3) providing a stimulus so that students are more enthusiastic. to learn with e-book guidelines that can be accessed on Android by each individual, (4) train students to learn independently according to their talents and interests, (5) provide the same stimulus by equalizing learning experiences and individual perceptions (Ekayani , 2017).

Besides that, textbooks will not run optimally if they are not combined with a good learning model. So that students' pedagogical needs can be met, it is necessary to implement a teaching and learning process using a learning model (Wulandari, Trisnawati, Suratman, & Narmaditya, 2020). There are three basic integrated frameworks, namely the technology acceptance model, flow theory, and innovation theory, which means that technology can run optimally with the support of supporting materials or materials and textbooks (Liu, Liao, & Pratt, 2009). Problem Based Learning is a learning model that is quite effective for learning economics, it contains facts about economic, social, cultural and other problems that require high analysis so that students can play an active role in learning to provide solutions to solve these problems (Abidin, 2014). The Problem Based Learning learning process involves each student in a small group and each student gets

a role in the learning group. Students identify what they have discovered in the phenomena around them, find out what they need to know, and how they make efforts to find sources of information that are relevant to the phenomena that occur (Phungsuk, 2017).

Based on the various existing problems, it is necessary to develop digital books optimally which are problem-based and are expected to be able to make students more active and enthusiastic in learning. Alternative learning to improve students' critical thinking patterns and activeness in the learning process is by using innovative, interactive textbooks. Textbooks that can help teachers in this case are e-books. Apart from that, there is also a need for a learning model that is able to hone students' critical thinking skills in identifying events or happenings that occur around them and this will be easier to do if they use textbooks that support this (Sadiman & et al, 2008). It is also hoped that the development of digital books can overcome students' learning difficulties and reduce the burden on students in procuring physical books. In developing digital books based on Problem Based Learning, it is hoped that it will be able to increase students' effectiveness in learning online.

The aim of this research is to determine the process of developing Digital Books (E-Books) based on Problem Based Learning in General Administration subjects at SMK NU Lamongan, to determine the feasibility of Digital Books (E-Books) based on Problem Based Learning as a variation of General Administration textbooks. based on validation/assessment from material experts, design experts, and language experts in General Administration subjects, and knowing student responses regarding the development of digital books based on Problem Based Learning in General Administration subjects at SMK NU Lamongan.

METHOD

This type of research is development research. The method used is Development or Research and Development (R&D) which refers to the IDI procedural type (Instructional, Development, Institute) in which there are three stages, namely the Define stage. This stage is aimed at analyzing needs. The second stage, namely Development, is aimed at developing an e-book. The third stage is Evaluate (evaluation) (Rahmi & Agustina, 2018). Of these three stages, at the define and develop stages an idea for a development procedure will be developed which is described below:

1. Define Stage

At this stage the researcher conducted a survey at the NU Lamongan Vocational School field to find out the problems being faced and the needs of students and teachers through interviews between related parties.

2. Development Stage

After the analysis results were obtained, the researchers designed the development of textbooks using e-books which they felt would help students in the learning process. In making the e-book itself, 3 (three) validation stages are carried out. The first validation was carried out by the subject teacher as material validator, the second validation was carried out by a linguist, and the design validator was carried out by an economics education lecturer.

3. Evaluate Stage

This research was limited to the Define and Develop stages where the Evaluate stage or distribution of e-books for evaluation was not carried out due to cost constraints and the long time required. The researcher developed an e-book for the even semester, and the even semester learning process had not yet taken place when the e-book was developed so that the e-book was not distributed.

Research Instruments and Data Analysis Techniques

This research instrument is a validation sheet presented using the check list method. To assess a product that has been developed, the validator uses a validation sheet which is based on 3 (three) aspects, namely appropriateness of the material, appropriateness of presentation/design, and appropriateness of language. The next step of the validation results will be analyzed quantitatively, namely by giving a score

ranging from 1-5 with categories of very feasible to not feasible. The score results will be presented in table form. Next, calculate the percentage (P) using the equation:

$Dp = n/N \ x \ 100\%,$

Information:
Dp = Expected score
n = Number of scores obtained
N = Maximum number of scores
100% = Constant

After the calculations are obtained, they will then be combined with data validity criteria as in the table below (Rachmawati, 2012).

Table 1. Data Validity Criteria

(%)	Criteria	Information
88-100	Valid	Can be used
66-79	Fairly Valid	Used with minor revisions
55-59	Not valid	Can not be used
0-49	Invalid	Completely unusable

RESULTS AND DISCUSSION
E-Book Development Process

This research developed an e-book on General Administration material for NU Lamongan Vocational School based on Problem Based Learning (PBL). To obtain a valid book, a development stage is used which consists of the define and develop stages using a design development procedure containing a front-back analysis stage and a prototype stage.

1. Define Stage

This definition stage is carried out by means of front-back analysis. The analysis carried out contains several types, namely:

a. Curriculum Analysis

The curriculum used at SMK NU Lamongan is the 2013 Curriculum revised 2017. At this stage, researchers analyzed the syllabus and general administration lesson plans for the even semester at SMK NU Lamongan.

b. Analysis of Teaching Materials

Researchers analyzed the teaching materials used by asking subject teachers and homeroom teachers for information. According to the interview results, it can be identified that there are no supporting teaching materials that can be used by teachers and students due to teachers' difficulties in finding teaching materials and the limited economic capabilities of students' families.

c. Analysis of Student Characteristics

Based on the survey conducted, it can be concluded that students carry out the learning process online. Due to the absence of teaching materials and manuals that students have, students have difficulty learning, thereby reducing students' motivation to learn.

From an economic perspective, students can be categorized as middle to lower average. This is the reason for students' inability to buy student manuals or learning resources.

2. Development Stage

From the results of the analysis stage, to meet students' needs in assisting the teaching and learning process, an e-book design was prepared which students are expected to use during online learning. The

contents of the e-book itself include (1) Cover; (2) Foreword; (3) Table of contents; (4) Core material; (5) practice questions.

E-book Eligibility

The next step is the validation process carried out by the validator. The research results show that the e-book is suitable for use with several revisions. Suggestions obtained from the three validators include:

a. At the beginning of each chapter, KI and KD are listed.
b. Include learning objectives.
c. Provide introductory material after the learning objectives.
d. Insert images and YouTube or other links that are relevant and appropriate to the main material.
e. Make a summary of the material at the end of each KD.
f. Added practice questions for independent study at home.

After having discussions with the validator, the researcher then revised the parts that needed changes and additions according to the validator's suggestions. Product feasibility analysis is carried out by calculating qualitative and quantitative data. Qualitative testing was carried out by means of validation carried out by three validators, namely design experts, material experts and language experts. This validity test is in accordance with research conducted by (Febrianti, Budiono, & Isnawati, 2013) and (Fuanda, Nainunis, & Aditya, 2017).

Table 2. Validator Assessment Results

Validator	Validator Assessment	Criteria
Design Expert	73.25%	Worthy
Materials Expert	83.12%	Very Worth It
Linguist	92.25%	Very Worth It
AVERAGE	84.3%	Very Worth It

Source: 2020 processed data (Data managed by researchers)

Based on the results in the table above, the score obtained from design experts was 73.25%, the average score from material experts was 83.12%, and the average score from validation results from language experts was 92.25%. So to present the overall results of each validation, the results obtained were 84.3%, which can be said that the use of e-books to assist the teaching and learning process is valid and suitable for use.

Learning success can be expressed as a change that occurs in each individual with an increase obtained from the results of their learning. Not only the knowledge but also the skills, attitudes, responsibility and appreciation of the individual learning (Nasution, 1982). According to (Rachmawati, 2012) a media in any form can be said to be valid if the score achieved is in the range of 80% -100%.

3. Student Response to E-books

The results of student responses to digital books (e-books) based on problem based learning in general administration subjects are presented in the following table.

Table 3. Calculation Results of Average Student Responses

No	Question	Mark				%
		4	3	2	1	
1	The language used in the e-book is easy to understand	13	5	0	0	93
2	The material presented is clear and coherent	12	6	0	0	92
3	Attractive e-book design	13	5	0	0	93
4	The existing images make it easier to understand the existing material	13	5	0	0	93
5	The material in e-books can increase learning motivation	15	3	0	0	95
6	An e-book that is easy to use anytime and anywhere	14	4	0	0	94
7	E-books can increase the intensity of learning to become more independent	15	3	0	0	95
8	E-books present material that is easy to understand	12	6	0	0	92
9	E-books can help think critically about the problems presented	15	3	0	0	95
	AVERAGE					**93.5**

Source: 2020 processed data (Data managed by researchers)

From this table it can be stated that the student response to the e-book that was developed was positive, both in terms of language, in terms of the presentation of the e-book, and in terms of the suitability of the material content. In e-books that explain material that is easy to understand, the average percentage is only 91%, where the content of the material needs to be improved to make it more innovative and interesting and the design needs to be varied so that students do not get bored when studying the content of the material. The results of the student response questionnaire with subjects totaling 18 students to e-books obtained an average of 93.5%, where these results fall into the range of 81%-100% and are included in the very appropriate category when interpreted into the score interpretation criteria scale (Riduan, 2009).

The e-book on general administration subjects that was developed contains stimulus in the form of daily problems, material equipped with pictures and links from YouTube and the web that support the material in the e-book, and a summary of the content of the material as well as enrichment questions as materials for students to practice independently at home. The e-book developed is an interactive textbook because students can access several website links included in the content of the e-book material using a computer or smartphone via an internet site. E-books are learning media that have interactive benefits, this is in accordance with the statement (Rahardjo, 2002). This activity is something that is said to be effective and able to make students active because this learning requires repetition in creating new skills or remembering new fact statements discovered independently by students.

Discussion of Research Results
E-Book Development Process

The e-book development process is carried out by first analyzing the situation and conditions of the students. The results of interviews with students said that they personally did not have a guidebook, due to the lack of finances of the average student's parents. So to overcome this, an e-book was created that can be downloaded on each student's cellphone, as well as for all groups. The e-book creation process itself has been revised several times. Among other things, the design is made more attractive. The components of the e-book itself, the researcher assumes there is material and practice questions. In the material itself, a link is provided to access YouTube, which is intended so that students do not get bored with monotonous reading. For questions there are multiple choice, essays and also projects for students. So that students' thinking processes will refer to Problem Based Learning.

Several studies that support the e-book creation process include previous research conducted by (Kurniasih, Baedhowl, & Sudiyanto, E-book Media Based on Problem Based Learning in Economic Subjects, 2019) entitled E-Book Media Based on Problem Based Learning in The Economics Subject said that e-books are an innovation to make it easier for teachers and students to study economics. E-The digital world has come to bring various conveniences with various creativity, e-books have really become one of the things that makes students enthusiastic about learning. This research was also strengthened by research conducted by (Anwar & Wibawa, 2019). The research results show that interactive e-books on local content subjects in the Sasak Alus language are suitable for use as learning resources - content criteria 80.5%, presentation, 81.1%, instructional design 83.1%.

To test the use of e-books, similar research was also carried out by (Saputri & Susilowibowo, 2020) which showed research results, where the feasibility of the content was 89.22% with the criteria "very feasible". 92.10% with the criteria "very feasible" was obtained from the presentation aspect. The linguistic aspect obtained a percentage of 78.57% for the "decent" criteria. The percentage of 85.94% of the "very feasible" criteria was obtained from the graphic aspect. The validation results obtained from several experts obtained an average of 86.45% of the "very feasible" criteria.

E-Book Eligibility

Based on the results in the validation table for design experts, material experts and linguist experts, the score obtained for design experts was 73.25%, the average score for material experts was 83.12%, and the average score for validation results from linguist experts was 92.25%. So to present the overall results of each validation, the results obtained were 84.3%, which can be said that the use of e-books to assist the teaching and learning process is valid and suitable for use. This e-book is one of the interactive media which has many advantages compared to ordinary textbooks (Kurniasih, Baedhowl, & Sudiyanto, E-book Media Based on Problem Based Learning in Economics Subjects, 2019). This is because students no longer need to bother with lots of heavy books. Apart from that, to face a pandemic like now, students need digital books that are easy to access and carry everywhere. Another reason is because students' low interest in reading is below the international median (Suryaman, 2015) so students need media that is not boring to study.

To support the implementation of this e-book used in the learning process, it is necessary to have a teacher who always accompanies the student's learning process because the learning model used is Problem Based Learning. The effectiveness and strength of learning through teaching materials, learning media, and appropriate learning models will achieve quality student understanding and memory (Hidayatullah, Wiryokusumo, & Walujo, 2019). The obstacle that is often faced today is the limitations of students who are not always fluent in online learning such as Zoom or Google Meet. Obstacles like the ones above can be overcome by intensive teacher assistance for each student who is studying. The teacher assists flexibly if there is something that the students do not understand. However, teachers still have to try to have discussions with all students even in limited circumstances by dividing students into two parts so that each student gets more attention and facilitates discussions (Melek, Ipek, & Edibe, 2015).

Student Response to E-books

The student response to the e-book developed was positive with a percentage of 93.5%, where the language used was easy for students to understand, the material presented was clear, accompanied by pictures and YouTube links that supported the available material. Apart from that, e-books are easy to use anytime and anywhere, especially during online learning and students can practice critical thinking about several problems presented in the problem based learning model in e-books.

The positive response of students to e-books as teaching materials has also been carried out in similar research by (Istifarida, Santoso, & Yusup, 2017). The research results show that: (1) students need a learning model that is not monotonous in text, but requires other supports such as video and interactive media, as well as outdoor learning; (2) the validation results of the expert team show an average value of 73.2%, which is included in the appropriate criteria according to the requirements. Testing of student responses showed a

positive response with a percentage of 83.2% in very feasible criteria; (3) calculation of the effectiveness of learning media using the t-test and the results of tarithmetic = 10.244> ttable = 1.67. Which means that e-books have succeeded in making changes to students' spatial thinking abilities.

CONCLUSIONS AND RECOMMENDATION

The process of developing E-books in general administration subjects based on Problem Based Learning is carried out through two stages in the IDI development method, namely the define and develop stages. Based on the results of validation carried out by 3 validators, it shows an average of 83.12% for material expert validation, 73.25% for design expert validation, and 92.25% for language expert validation. So the average value of the three can be obtained at 84.3%. Meanwhile, in the student response questionnaire, an average number of 93.5% was obtained which showed a positive response to the e-book being developed. This can be an indication that the e-book created can be said to be valid and suitable for use. Every research will definitely have limitations, which in this research is the lack of student respondents who participated in filling out a questionnaire to find out the results of the research. The suggestion from this research is to add student respondents to strengthen the research results and comparisons can be made with research in state schools.

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