Creating Interactive E-Book Based on Project with Tutorial Video

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Abstract. In rapid technological advances, the development of media and teaching materials needs to be integrated with the development of tablet computer technology. E-book applications have brought the use of e-books as a learning tool. To produce the expected product, the development procedure used was the 4-D development model (four-D model) with the stages of define, design, development, and dissemination. The product was developed using the Flip PDF Corporate application, where each page can be flipped (back and forth) like a real book. This e-book also contains information on learning media with text, images, video tutorials, and student worksheets. Some of the advantages of this application can be accessed offline, so students can study independently via computer or phone. The findings revealed an interactive e-book created in the learning media course using an innovative project and tutorial video that could be implemented in the learning process.

Keywords: Interactive E-Book, Project, Tutorial Video.

1 Introduction

The learning paradigm has changed in various aspects of learning, including in instructional design, media and teaching materials that need to be integrated with technological developments [1]. The use of technology is expected to improve learning outcomes [2]. They represent an expression of educational goals, which are about what students are expected to know, understand, and can do after learning activity [3][4]. To improve learning activity, various mediums are employed to achieve the needed results and improvements [5]. Various technology-integrated learning media have been developed as a solution to assist both teachers and students in overcoming problems encountered during the learning process [6].

Learning media aims to develop learning competencies, not only through print media but also using a system of symbols, images, and sounds so as to increase understanding and active participation [7]. The development of learning media is very necessary in accordance with the demands of the curriculum, the characteristics of students, and it can solve problems [8]. In the past, teachers used teaching media in printed form, but with the development of science

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and technology in 21st century learning, there are opportunities for educators and students to switch to using computer technology-based media. The use of technology in learning is the basis for an educator to develop learning media [9]. One of the learning media that can be developed is an interactive e-book. Digital books or e-books allow readers to understand the contents of the book, view videos and 3D models dynamically [10].

Interactive e-books can increase their learning motivation and academic achievement compared to students who learn to use textbooks [11]. Because interactive e-books differ from printed books, they contain multimedia content in order to present more interesting teaching materials and make learning more enjoyable [12][13]. One of the applications used in making e-books is Flip PDF Corporate, which produces pages that can be flipped (back and forth) like a real book, and videos, images, and animations can also be inserted [14]. Some of the advantages of this application can be accessed offline, so students can study independently via a laptop or android. The interactive e-book media is connected with a link that makes it easy to access online materials and quizzes connected to Google Classroom [15].

Organizing learning materials in e-books refers to making a sequence of learning materials (squencing), and to the linkage of facts, concepts, procedures, and principles in learning materials to students (synthesizing).[16]. One of the learning models that can support them is through project-based learning [17][18]. Project-Based Learning (PjBL) is one of the learning models appropriate for learning with certain products as an output, for example, creating learning media. This model is appropriate for students from elementary school level to university level and can be implemented with tutorial video [19][20]. One of the advantages of tutorial video is that it can demonstrate phenomena and procedures that involve movement and can attract students' attention and interest through moving images, audio, and text media, and students as smartphone users are quite adept at using them [21]. Based on these problems, the research team needs to develop an interactive e-book with tutorial videos on learning media courses. This e-book is also equipped with project-based student worksheets, so that learning objectives are more focused and achieved.

2 Method

This study was research and development (R&D) with the Thiagarajan 4-D development model [22] . The stages were define, design, development, and dissemination [23]. At define stage, there were three analyses: they are curriculum analysis, needs analysis, and problem analysis. In the design state, we are designing learning outcomes, e-book formats, component videos, and compiling instruments. Develop stage, e-book was validated by the content expert, the education expert, and the learning media expert. At the dissemination stage, an e-book was implemented for students. A practicality test was carried out based on the responses of teachers and students. The validation results were then calculated to find the level of feasibility using the formula Eq. 1

$$P = \frac{\Sigma}{N} \text{ x } 100\% \qquad (1)$$

Tabel 1. The Feasibility of Validation Criteria for the Teaching Materials

Criteria	Interval Percentage
Very Less Feasible	<21%
Less Feasible	21% -40%
Quite Feasible	41% - 60%
Feasible	61% - 80%
Very Feasible	81% - 100%

3 Result and Discussion

3.1 The Defining Stage (Define)

At this stage, three analyses were needed: 1) curriculum analysis; 2) needs analysis; and 3) problem analysis. The analysis was carried out based on the results of observations, and it can be concluded that the limitations of the teaching materials caused the learning process to be less than optimal for directing students to relate the material to practice. The development of teaching materials was very necessary in accordance with the demands of the curriculum, the characteristics of students, and its ability to solve problems[24]. Previously, teachers used teaching materials in printed form, but with the development of science and technology in 21st-century learning, there are opportunities for educators and students to switch to using teaching materials based on computer technology and maximize the utilization of technology [25].

3.2 The Designing Stage (Design)

At this stage, design the components of writing. The steps were arranging learning outcomes, topics, project worksheets, and tutorial videos. The systematics of e-book consists of: a cover, an introduction (see Fig. 1), a table of contents, a list of pictures, a list of tables, learning media materials equipped with sample questions, project activities, video tutorials (as shown in Fig. 2), evaluation questions, and a bibliography.

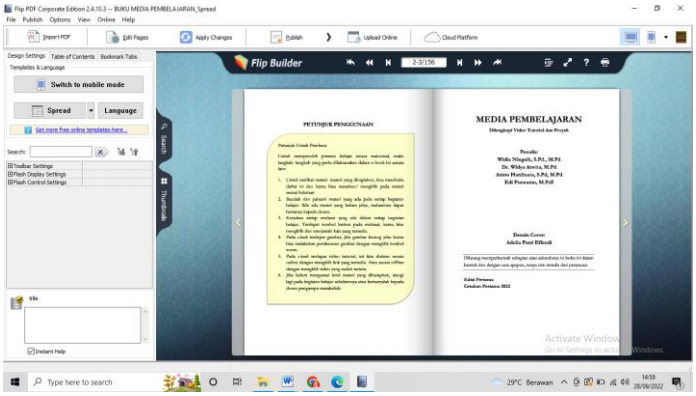


Fig. 1. A designed page on e-book Reader

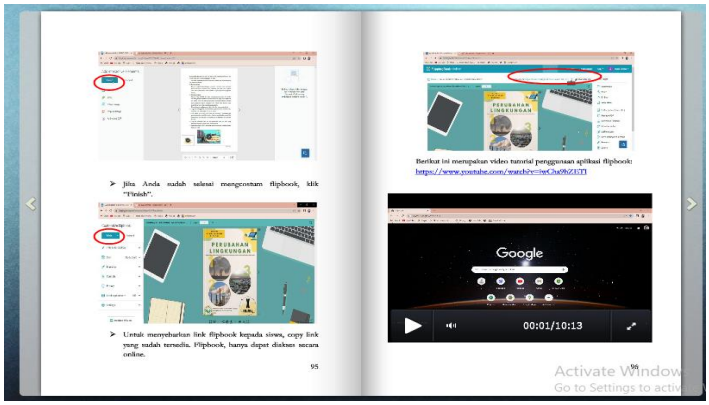


Fig. 2. A designed page on tutorial video

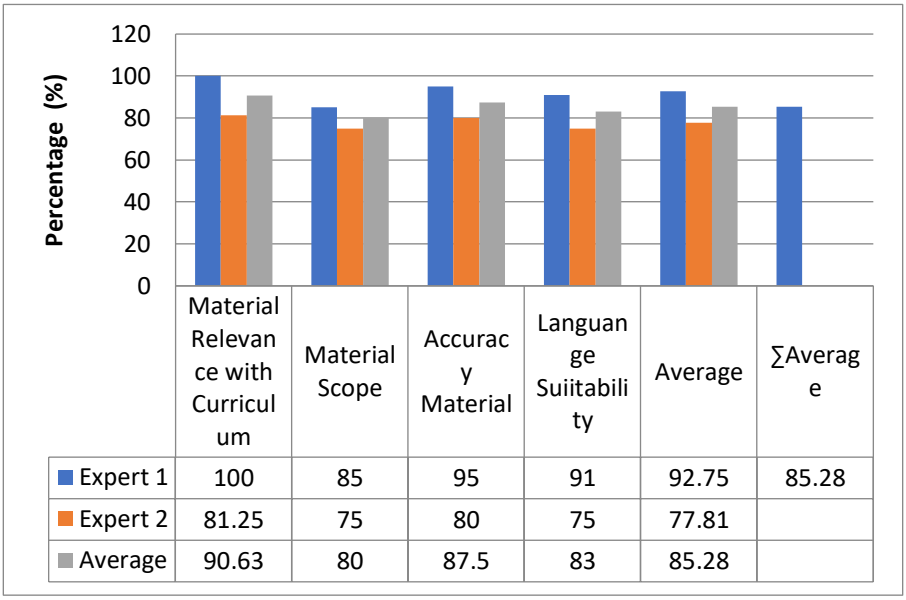
The interactive content in the developed e-book can be supported by different media and can work with different formats because we coded these elements with HTML5 and flash based on Flip PDF Corporate.

3.3 Development Stage (Develop)

After the interactive e-book prototype and tutorial video were complete, they would be validated by 2 content experts, 2 education experts, and 2 learning media experts. Validation would be repeated until the product was valid. Based on the questionnaire that had been filled out by experts, the validation results would be analyzed.

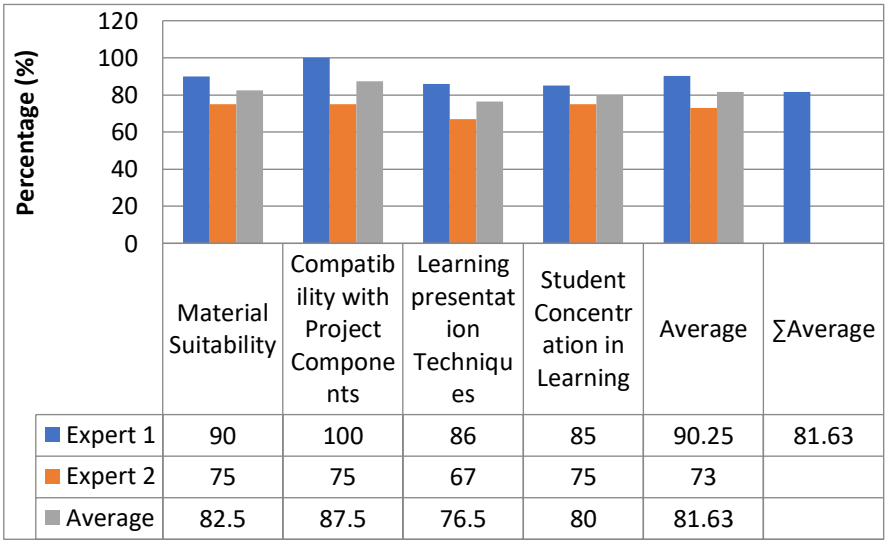
The result of content expert validation stated that the e-book scored 85.28% with very suitable criteria (in Fig. 3). It contains relevant content for the curriculum, and this ebook is accompanied by clear examples that suitable for our daily activities [26]. The result of education expert validation stated that the e-book scored 81.63% with very suitable criteria (in Fig. 4). This e-book was very compatible with the project components. Presentations accompanied by video tutorials and projects enable students to improve their creative thinking skills (choose relevant information to be used as projects, make projects that are worthy of acceptance) [27].

The result of learning media expert validation stated that the e-book scored 89.38% with very suitable criteria. According to media experts, the developed learning media was in accordance with the instructional objectives and referred to the cognitive, affective, and psychomotor domains [28]. This e-book media is simple and easy to use, has affordable prices, can last a long time, and can be used continuously; this should be one of the main considerations in choosing learning media.



	Material Relevance with Curriculum	Material Scope	Accuracy Material	Language Suiitability	Average	∑Average
Expert 1	100	85	95	91	92.75	85.28
Expert 2	81.25	75	80	75	77.81	
Average	90.63	80	87.5	83	85.28	

Fig. 3. Content Expert Interpretation of Bar Graph



	Material Suitability	Compatibility with Project Components	Learning presentation Techniques	Student Concentration in Learning	Average	∑Average
Expert 1	90	100	86	85	90.25	81.63
Expert 2	75	75	67	75	73	
Average	82.5	87.5	76.5	80	81.63	

Fig. 4. Education Expert Interpretation of Bar Graph

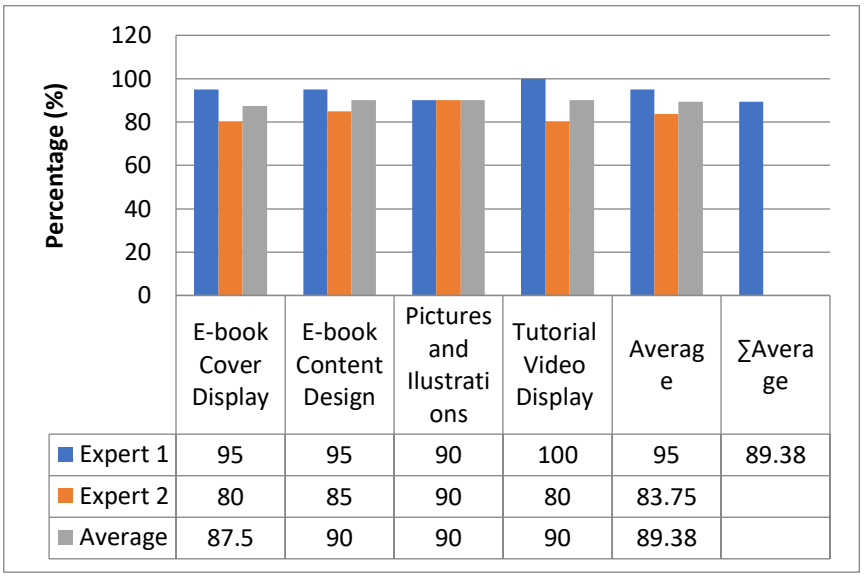


Fig. 5. Learning Media Expert Interpretation of Bar Graph

Based on the results of discussions with the validator, the e-book that has been developed needs to be improved in several parts so that it can be tested further.

3.4 Dessimenation Stage (Dessiminate)

The dissemination stage was carried out to promote the product developed so that it was accepted by users as individuals, groups, or systems. In this stage, we measured practicality. The student responses to the e-book used were 89.75% with very good criteria. The lecture responses were 78.31% with good criteria. So this e-book is very well used by students who take learning media courses.

4 Conclusion

The study achieved a design for an e-book based on a flip PDF corporate with interactive elements for a tutorial video. This e-book also contains information on learning media with text, images, video tutorials, and student worksheets with HTML5 and Flash. The most important feature of this application can be accessed by many different devices and platforms. Creating this e-book resulted in a product that was very feasible to implement as learning media by content experts, education experts, and learning media experts. We also plan to conduct a survey on the usability of our e-book among our students in our future research.

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