

**Development of Digital-Based Physical Education Textbook for 11th Grade
High School Students****Anggar Setia Budi¹, Hartati^{2✉}, Syamsuramel³**Prodi Pendidikan jasmani dan Kesehatan FKIP Universitas Sriwijaya, Jalan Raya Palembang-Prabumulih Indralaya Ogan Ilir, Indonesia¹²³**Article History**Received January 2024
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Published Vol.13 No.(1) 2024**Keywords:**Instructional Book; Digital-
Based; Physical Sport
and Health Education**Abstract**

A valid, practical, and effective digital-based instructional book has been successfully developed. This research follows the Borg and Gall development model, which consists of ten steps, including identifying potential and problems, data collection, product design, design validation, design revision, product testing, product revision, usage testing, product revision, and mass production. Data is collected through the use of validation sheets, questionnaires, and tests. Validation results by three expert validators for the digital-based Physical Education and Health instructional book yielded an average score of 4.55, falling within the highly valid category. Testing the digital-based Physical Education and Health instructional book product indicated its practicality with a score of 3.47 in the very good category. The use of the web-based sepak takraw instructional media model was also considered highly practical by students, with a practicality score of 3.60 in the very good category. The effectiveness of this instructional media model was measured by an N-gain score of 0.63, categorized as moderate. Therefore, it can be concluded that student learning outcomes can be improved through the use of Physical Education and Health learning with a web-based instructional media model. It is hoped that teachers will frequently use web-based instructional media models with audiovisual features to ensure that students achieve the best possible learning outcomes.

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INTRODUCTION

Education is the main means that has a major role in the progress of the nation and state in all sectors. As a dynamic force in everyone's life, education has a significant impact on physical growth, intellectual development, social interaction, and morality. Acquiring knowledge is a task that must be done by every individual to create a generation that has superior skills and provides great benefits for the progress of our country. Rapid advances in science and technology (science and technology) have simplified and accelerated various aspects of life. It is important for teachers to pay extra attention to the development of innovative digital teaching materials to meet the needs of improving the quality of the learning process in schools. It also aims to support student-focused learning approaches, increase learning efficiency, and effectiveness to achieve optimal learning outcomes. The provision of good teaching materials and in accordance with the national curriculum can help students learn effectively and efficiently (Ramadhana et al., 2021) (Hartati et al., 2020).

Textbooks have a very important role in the learning process, because they can support and strengthen the explanation of the material provided by the teacher. As a source of information, textbooks are also very essential in learning because they can be used to explain complex phenomena, including abstract concepts. Teaching materials need to include the vision, tasks, context, content, and process of information presented to motivate students in the learning process. Quality teaching materials must also be able to present material in accordance with the curriculum, follow the development of science and technology (IPTEK), and integrate learning well so that the desired competencies can be achieved. The selection and development of appropriate learning techniques can support the delivery of messages accurately, effectively, and efficiently. This can create as well as enrich learning experiences, present a picture of events as accurately as possible, and improve student performance and skills (Aryanti, 2018)

Based on the results of initial observations made by researchers on grade XI students at State High School 8 Palembang City. It was found that many students were less interested in reading textbooks or conventional books. Today, schools still rely on textbooks or conventional books as a source of learning for students. This is due to the lack of availability of valid digital-based textbooks to support student learning processes. It does not happen without reason, because this phenomenon is one of the impacts of the era of digitalization and the rapid progress of the times. Based

on observations, several reasons students are less enthusiastic about conventional textbooks, including the lack of attractiveness of images in textbooks and the lack of animation that is usually found in digital textbooks. In addition, explanations and descriptions of material in conventional textbooks tend to attract students' attention less, making them feel bored. Another obstacle is the size and weight of conventional textbooks, making them difficult to carry.

Research on the development of digital-based textbooks is supported by research conducted by (Wijaya Kuswanto & Dinda Pratiwi, 2020) and (Yektyastuti & Ikhsan, 2016) The findings of the study stated that the development of digital and android-based teaching materials was considered very appropriate to support the educational process. This shows that the use of textbooks has great potential to help students in understanding learning material. The use of digital textbooks is one of the features that can be used as a learning resource for students and also as material for educators to develop learning materials. Thus, digital textbooks can be an alternative media in the implementation of the teaching and learning process. According to (Sofyan, 2019) Research needs to be done related to this interactive digital book because in the learning process, there are important components needed so that learning activities can run effectively and purposefully. One crucial aspect is the availability of teaching materials that can be a learning guide for students and educators. Thus, it can be concluded that the media has a role as a tool that can be used and utilized to stimulate development in various aspects of physical, motor, social, cognitive, affective, creative, creation, and language, with the aim of encouraging and facilitating the teaching and learning process.

The formulation of the problem in this study includes how to develop digital-based textbooks on Physical Education and Health subjects that have validity and practicality. Furthermore, it was asked whether the digital-based textbook for Physical Education and Health subjects developed was effectively used as a learning resource. Therefore, the purpose of this study is to create a digital textbook on digital-based Physical Education and Health subjects that is valid and practical for grade XI high school students, as well as to show that this textbook is effective as a learning resource.

METHODS

This research uses development methods or other terms Research and Development (R&D). (Sugiyono, 2016) explains that "this method is

used to develop certain products and test their effectiveness". This research adapts the borg and gall research model with 10 stages, as for the explanation of the stages as follows

At the potential and problem stage as well as data collection, an analysis of student needs is carried out which includes potential, problems, and data collection. This analysis process involves the use of questionnaires distributed through Google Form to grade XI students at State High School 8 Palembang City. The results of the analysis of the needs of the learners then become the basis for proceeding to the initial product design stage. At the initial product design stage, e-book design development is carried out as a prototype of a digital book. This e-book is designed to present teaching materials, materials, strategies, and learning models in physical education. The uniqueness of this e-book lies in its interactive nature, which includes menu buttons, animations, sound effects, and images relevant to the material presented. As explained in the research tool, this e-book aims to present an innovation in teaching materials and learning methods that follow technological developments and the demands of the times. The content of the e-book is arranged in accordance with the curriculum that is being implemented, namely the independent curriculum. Through this approach, it is expected to provide positive updates in the learning process in accordance with the demands of the times.

The Validation Phase is carried out with three validation processes, namely media validation, language validation and material validation. Third, validation is carried out by three experts as validators using validation sheets. The follow-up of this stage is a product revision adjusted to the results of the validity test conducted by experts. The revised product was then tested on a small group.

This small-scale product trial involved 35 respondents who were class XI high school students. This research was conducted with the aim of knowing the quality of products that have been made and then developed to the next stage. The results of the questionnaire will be calculated on average and categorized as the level of practicality of using digital-based Physical Education and Health textbooks. The follow-up to this stage is a revision adjusted to the results of the practicality test in a small group.

Then the trial phase of use was carried out on two classes of class XI students with a total of 70 students from State High School 8 Palembang City. At this stage, practicality tests and effectiveness tests are carried out, practicality tests are car-

ried out by filling out the same questionnaire as the practicality questionnaire in small group product trials, aiming to see if there is an improvement from the results of previous product revisions. Effectiveness tests are carried out by pre-test and post-test. The instrument used is in the form of question items with elaboration in the form of 20 multiple choices and 5 short fills. Students are asked to do pre-test questions then given treatment in the form of product use for one week and followed by post-test. The results of the pre-test and post-test are then analyzed using the n-gain score test and using SPSS 23 to see the normality of the pre-test and post-test data.

RESULTS AND DISCUSSION

Potential and problem levels and data collection

In this phase, researchers conducted interviews with teachers who taught Physical Education and Health subjects in grade XI high school. The interview results show that there is a need to develop digital textbooks in Physical Education and Health subjects as a learning resource that is in accordance with the applied curriculum, namely the independent curriculum. Next, researchers conduct an analysis of the needs of learners. This process begins by analyzing the real implementation of learning media in teaching and learning activities in schools. Therefore, the results of this step can be the basis for the development of learning media models. The results of this stage can be seen in the **Table 1**.

Table 1. Results of Student Needs Analysis

Category	N	%
Using a smartphone in activities	93	88,5
Using the smartphone for more than 5 hours	57	54,3
Agree if smartphones can be used as learning resources	105	100
The textbooks used are printed	86	81,9
Textbooks used in accordance with the curriculum	97	92,4
The weakness of textbooks is difficult to carry anywhere	62	59,4
Want interactive textbooks	51	48,6

It was found that in the teaching process, the use of learning media is still conventional and has not utilized modern technology. However, as many as 88.5% of respondents stated using smartphones in daily life, even 54.3% of them use

smartphones for more than 5 hours every day. This finding is the basis for researchers to develop digital-based Physical Education and Health subject textbooks, which are in accordance with the curriculum being implemented, namely the Merdeka curriculum. This digital-based Physical Education and Health textbook is equipped with features such as audio and access to watch videos related to learning materials. This is in response to the desire of 48.6% of respondents who want interactive textbooks, and they also show a desire not to have to carry conventional printed books anywhere.

Initial Product Design Phase

Researchers developed the initial textbooks for class XI Physical Education and Health subjects, by referring to the material included in the curriculum applied by State High School 8 Palembang City, namely the independent curriculum. The product that has been developed can be accessed through www.anggarsetiabudi.cloud link, where this product includes several contents such as textbooks, learning materials, learning video links, and is also equipped with a collection of questions as exercises for students.



Figure 2. Initial Product Design Results

After that, researchers run three validation processes, namely material validation, language validation, and media validation. This validation affirmation aims to ensure that the content of the textbook is in accordance with learning needs, the use of clear and accurate language, and the effectiveness of the media used in conveying information to students. The results of the validation stage state that the product that has been developed obtained a validity value of 4.55 out of a maximum value of 5, which can be categorized as very valid and feasible based on the evaluation of the three aspects tested by experts, namely aspects of media, language, and material.

Table 2. Expert Validation Results

Validation	Assessment Results	Category
Material	4.8	valid
Language	4,16	valid
Media	4.7	valid
Average	4.55	valid

Products that have been tested for validity are then revised according to the results and suggestions of validators. In this case, revisions were made to the media aspect, namely changing the cover to be more attractive, and in the language aspect words, sentences and punctuation marks adjusted to the Improved spelling and large Indonesian dictionary



Figure 2. Product Revision Results

Product Trial Phase

After the product has been declared valid and feasible, product trials are carried out on the developed product. This stage was carried out in a small group test with class XI student subjects with a sample of 35 learners.

Table 3. Small Group Practicality Test Results

Aspects	Average
Highlights	3,45
Facilities	3,53
Helpfulness	3,44
Final Average	3,47

The findings of the results at this stage, the products developed can be accepted by users (students) who are assessed through a practicality questionnaire with a practicality value of 3.47 out of 5 where there are still 0.53 values that have not met the revision of the results. The revision made is that access to digital-based textbooks is facilitated by being able to select the chapters you want to read without having to open pages one by one.



Figure 3. Small Group Practicality Test Product Revision Results

The product usage test stage was carried out in large groups with class XI subjects with a sample of 70 students. At this stage there are two things that are tested, namely practicality tests and effectiveness tests. Practicality tests are conducted through the same practicality questionnaire as the product trial questionnaire, which is aimed at seeing again whether the revised product can be accepted by users more than before.

Table 4. Large Group Practicality Test Results

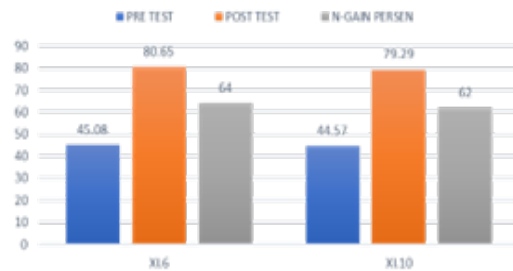
Aspects	Average
Highlights	3,59
Facilities	3,62
Helpfulness	3,57
Final Average	3,60

After carrying out the practicality test, proceed with the effectiveness test through the pre-test post-test method. The effectiveness test instrument in the form of a question sheet consists of 20 multiple-choice questions and 5 short fill-in, with a maximum score of 100. After undergoing a pre-test, students are then subjected to treatment, namely learning to use digital-based textbooks that have been declared valid, feasible, and acceptable to users, for one week. After the treatment is complete, a post-test is carried out using question items that are identical to the pre-test. The results of the effectiveness test analysis show that digital-based textbooks developed are effective in improving student learning outcomes, are in the medium category based on the N-gain classification by Hake (1998).

Table 5. Effectiveness Test Results

Class	Pre	Post	N-Gain Score	%
XI 6	45,08	80,65	0,64	64%
XI 10	44,57	79,25	0,62	62%
Average N-Gain			0,63	63%

Based on table data, it is known that the entire average n-gain score of student learning outcomes is 0.63 which is classified in the medium category, which is in the range of $0.3 \leq \text{gain} < 0.7$ according to (Hake, 1998) or in other words, digital-based Physical Education and Health textbooks that have been developed effectively to improve student learning outcomes. The figure below shows a graph of each class's n-gain on student learning outcomes



Picture 4. Effectiveness Test Graph

Average overall N-gain to improve student learning outcomes by 0.63 (moderate category). The increase is due to the learning process carried out using digital-based Physical Education and Health subject textbooks which are developed to be more interactive because the learning media contained in the digital-based Physical Education and Health subject textbooks have several features such as audio, images, and learning video links. The increase is due to the learning process carried out using digital-based textbooks that are developed to be more interactive. Interactive digital teaching materials allow students to be more active in making observations related to things that are abstract to them Khamidah et al., (2019). Then research conducted by Muflikatun et al., (2021); Setyo et al., (2022); Soekarman (2022); Savitri et al. (2022); Putra et al., (2023) strengthen the results that digital-based Physical Education and Health subject textbooks can improve student learning outcomes.

CONCLUSION

Based on the results of research on the development of digital-based Physical Education and Health Subject Textbooks for grade XI Senior High School, it can be concluded that the Digital-Based Physical Education and Health Textbooks for Class XI High School Students, which have been developed, are declared valid with an average value of 4.56, indicating a very valid category. Furthermore, the Textbook is considered practical with an average of 4.60, indicating a

very good category. The effectiveness of using this Textbook on grade XI students at State High School 8 Palembang City is also proven, with an N-gain score of 0.63, which is included in the medium category.

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