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Development of Inquiry-Based Social Science Digital Book to Improve Critical Thinking of Vocational School

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Abstract: This study describes the need to develop and take steps to build Inquiry-Based Social Science Digital Books to improve vocational high school students' critical thinking. This type of research is a case study approach whose data sources are data from class X Vocational High School Students and History Teachers. The data collection methods used observation, interviews, and documentation. Data analysis used the interactive flow analysis technique, which consisted of data reduction, display, and verification. Based on the results of field observations, the study results showed that student learning outcomes through Distance Learning (PJJ) History during the COVID-19 pandemic were still low. Based on the initial comments in six vocational schools in Sukoharjo Regency, it was found that social studies teachers had difficulties delivering history social studies material to students. As a result, students have difficulty in understanding the subject matter, impacting low learning outcomes. From the interviews conducted, information was obtained that teachers were less skilled at integrating social studies learning using digital book teaching media. Hence, developing an inquiry-based historical, and social studies digital book is still necessary to improve students' critical thinking.

Keywords: critical thinking, digital book media development, vocational school.

探究式社科电子书开发提高职校批判性思维

摘要：本研究描述了开发并采取措施构建基于探究的社会科学数字图书以提高职业高中生批判性思维的必要性。这种类型的研究是一种案例研究方法，其数据来源是来自 X 班职业高中学生和历史教师的数据。数据收集方法使用观察、访谈和记录。数据分析采用交互式流分析技术，包括数据缩减、显示和验证。根据实地观察的结果，研究结果表明，在新冠肺炎大流行期间，学生通过远程学习(PJJ)历史的学习成果仍然很低。根据苏科哈尔约摄政六所职业学校的初步评论，发现社会研究教师难以向学生提供历史社会研究材料。结果，学生难以理解主题，影响学习成果。从所进行的采访中获得的信息表明，教师在使用数字图书教学媒体整合社会研究学习方面的技能较低。因此，开发基于探究的历史和社会研究电子书对于提高学生的批判性思维仍然是必要的。

关键词：批判性思维、数字图书媒体开发, 职业学校.

1. Introduction

One of the demands of 21st-century learning is learning based on information and communication technology (ICT). Especially in the 2013 curriculum, ICT is defined as independent learning by utilizing the environment inside and outside the school. Indirectly with the COVID-19 pandemic outbreak, the government ordered the stay-at-home program to suppress the spread of COVID 19. Learning media development is the only way during the COVID-19 pandemic while still prioritizing students who have an interest and are interested in learning. Learning media

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is very useful for students because it increases knowledge and can foster a spirit of learning for students [1]. Learning media is well designed to generate motivation and stimulate student learning and improve understanding of learning materials so that it will impact improving the quality of education. Learning media can be used to support the learning process in schools to improve the quality of learning and student understanding [2].

The facts on the ground show that there are still many problems in the teaching and learning process, especially in Social Science subjects, where there is some abstract material, so it is pretty tricky for students to learn it. The problem in learning History for Vocational High School students in Distance Learning during the COVID-19 pandemic is the low student learning outcomes. Based on the results of initial observations at 2 SMKs in Sukoharjo Regency, which consisted of SMK Negeri 1 Sukoharjo, SMK Negeri 2 Sukoharjo, SMK Negeri 3 Sukoharjo, SMK Negeri 4 Sukoharjo, SMK Negeri 5 Sukoharjo, and SMK Negeri 6 Sukoharjo, it was found that history teachers experienced difficulty in conveying material to students. Teachers use book-based assignment methods in distance learning during the COVID-19 pandemic. Students experience difficulties in understanding subject matter that impacts learning outcomes. The average value of History subjects during the History Daily Test is 60. The History-Social Science daily test results show that critical thinking skills are still relatively low, and there must be an appropriate solution to this problem. So that the solution to these problems, learning aids are needed, including appropriate and effective learning media that can create conducive and encourage the success of the teaching and learning process.

One learning medium that fits these criteria is digital book learning media, also known as e-books. Digital books (e-books) are text, images, audio, and video publications, which can be read on a computer, laptop, tablet, or smartphone. Digital books require the devices used to access them, such as e-readers, tablets, smartphones, and others[3], [4]. E-books can be read on various gadgets such as computers, smartphones, tablets, and other devices. The e-book format supports text display adjustments according to the screen size of a gadget.

This research focused on the current implementation of social science learning and the need to develop an inquiry-based digital book for Vocational School Students and strategies and steps that are carried out in its development for Class X Vocational High School students in Sukoharjo Regency. Questions that need to be solved include why it is necessary to develop an Inquiry-Based Social Science Digital Book and the steps for creating the learning model. Therefore, this study aims to explain the need for developing social studies digital books and the steps to improve the critical thinking of vocational students.

2. Literature Review and Hypothesis Development

At the vocational high school level or vocational madrasah aliyah, social studies subjects contain Geography, History, Economics, Sociology, and Anthropology materials. In learning social studies subjects, students are directed to be able to:

1. Understand concepts related to people's lives in their environment;
2. Think logically and critically, have curiosity, an-do problem-solving skills, and social life skills;
3. Commit to social and human values;
4. Communicate, collaborate, and compete in a pluralistic society at local, national, and global levels.

Regulation of the Director-General of Basic Education No. 07/D.D5/KK/2018 changed the structure of subjects in the Vocational Secondary Education environment. Indonesian History subjects for the Vocational Secondary Education environment experienced a significant change, only getting 3 hours of lessons in class X, which was previously given 2 hours for all grade levels, namely grades X-XII. This is different from the structure of subjects in the General Secondary Education environment which learn from class X-XII with 2 hours of lessons at each grade level. History learning aims to introduce the characteristics and identity of the nation [5].

Vocational lessons in vocational high school are often regarded as monotonous, boring, and other negative views. On the contrary, vocational/vocational lessons require teachers to innovate as a whole, especially methods, approaches, and especially appropriate learning models or strategies. The goal is to attract students' interest in participating in vocational learning. Students' learning process needs to be constructed to experience themselves and find meaning in the knowledge they learn. So that students can use the knowledge and skills they have acquired to solve problems in life. The teacher's task here is to organize learning models and help connect old knowledge with new knowledge, then facilitate learning activities.

The development of learning media is the only way during the COVID 19 pandemic while still prioritizing vocational students who have an interest and are interested in social studies learning. Technology-based interactive learning media can provide students with up-to-date educational information, provide engaging instruction with electronic media, and promote their technical proficiency, all of which contribute to their professional development [6]. The selection of appropriate and appropriate learning media will make students not bored and motivated to learn. Learning media is very useful for students because it increases knowledge and can foster a spirit of learning for students [1]. The use of learning media is well designed

so that later it can generate motivation and stimulation for learning and improve understanding of learning materials that impact the quality of education.

Learning media can also be used to support learning processes or activities in schools to improve the quality of learning and understanding of students [2]. The e-book format supports text display adjustments according to the screen size of a gadget. According to [7], it was suggested to produce digital books using sigil software as learning media software that has economic value for students and is more flexible because it is efficient in its nature so that it can be used as a learning medium anytime and anywhere. However, applying a monotonous social studies learning model oriented to cognitive development alone will limit vocational students. One of the effective learning models used to improve the cognitive aspects of vocational students and the affective and psychomotor aspects of students is the inquiry learning model. The inquiry learning model is one of the learning models based on constructivist understanding and provides meaningful learning experiences for vocational students. Inquiry Learning focuses on investigating a problem in-depth following the work stages of the scientific method [7].

The inquiry learning model is one of the appropriate learning models to be applied to classroom conditions where students' abilities vary. The inquiry learning model is learner-centered, and students are also trained to develop thinking skills. Students are trained to think critically. In addition, it can arouse a passion for learning in students [8]. Inquiry learning consists of several levels, ranging from discovery to hypothetical inquiry [9]-[10]. Inquiry learning motivates students to make their own discoveries and is proven to develop students' physical and emotional potential [11]. Activities in inquiry learning include exploration, where the teacher plays a role in asking questions and problems that students will solve; Next is the introduction of the concept that students collect information related to experiences in everyday life. Finally, in concept application activities, the teacher exposes students to new situations based on exploration activities and concept application [12]. According to [13], the implementation of Inquiry Learning includes the following: stuents must be faced with problems.

This statement is reinforced by [14], revealing that learning using creative constructivism will be the main key to success in the industrial world because students become creators through scientific investigations. They will produce a new product of creativity and gain a priceless value. It can become internationally so that in education, one must get used to scientific investigations that can give birth to a creative work differing from what already exists [14].

Critical thinking is a pearl of reflective decision-making wisdom in problem-solving. We believe and carry out an intellectual process with active discipline and skills in conceptualizing, applying, analyzing, synthesizing, and evaluating information gathered from or generated by observation, experience, reflection, reasoning, or communication as a guide to beliefs and actions [15]. The skills that must be possessed consist of six aspects of critical thinking skills, namely analysis, inference, interpretation, explanation, self-regulation, and evaluation [16]-[17]. The study of the application of learning media also affects students' critical thinking skills [18].

3. Methodology

This type of research is development research (R&D) as explained by [19]. It can simply be translated that Educational Research and Development (R&D) is a process in education to develop and validate educational products. This cycle is repeated in more stringent R&D programs until the test data fields indicate the product meets the specified behavioral objectives. The research or development process steps consist of reviewing the research findings of the product to be developed, developing a product based on these findings, conducting field trials according to the background where the product is, and revising the research results.

Development research is defined as a systematic study of the design, development and evaluation of programs, processes and learning products that must meet the criteria of validity, practicality, and effectiveness [20].

Two types of development research are distinguished. The first type is focused on designing and evaluating a particular product or program to get an overview of the development process and study the conditions that support the program implementation. The second type is focused on reviewing previous development programs. The purpose of this second type is to obtain an overview of effective design and evaluation procedures [21].

The application of research and development in this The product produced in this study is a procedural/steps/syntax for the development of inquiry-based digital book learning development for guidance [22]. The data source referred to in the study is the subject from which the data can be obtained [23]. In this study, the data sources are informants: Social Studies teachers and students of Class X Vocational Schools in Sukoharjo Regency, events/activities in the form of social studies learning processes, activities carried out by teachers and students, document/archive data in the form of student lists and a list of grades for Social Science teachers at SMK Class X to find out pretest and post-test scores for social studies subjects at KD 1. Data collection methods used in this study were observation, interviews, and documentation. The research instruments used were observation guidelines, interview guidelines, and a list of documents. Observation guidelines are carried out by the

researcher entering the classroom during the social studies learning process.

4. Results and Discussion

4.1. Social Studies Learning Data

For social studies learning data, the method used is field observation using research instruments and observation guidelines for teachers. The observation was carried out by observing and interviewing the ongoing social studies learning implementation process. The observed and interviewed aspects were divided into three stages related to the social studies curriculum and materials, the development of e-books as social studies learning media, and the stages of suggestions and expectations for the development of e-books. Social studies were learning media books.

The aspects that were observed and interviewed at this stage were related to the social studies curriculum and materials: the curriculum and materials taught in class X of Vocational High School associated with the development of inquiry-based social studies digital books to improve students' critical thinking and media or learning resources that are often used in history learning. They also include social studies teachers' responses about E-Books as Social Science Learning Media.

At the stage of developing e-books as social studies learning media, the researchers observed and interviewed were: the use of e-books by vocational schools; students' attitudes towards using E-Books as social studies learning media; the effect of the use of E-Books on the teaching and learning process. At the stage of suggestions and expectations for the development of social studies learning media e-books that were observed and interviewed were: teachers' expectations of students related to the use of e-books as social studies learning media; Obstacles in using E-Books as social studies learning media; Suggestions/Messages of teachers on the use of E-Books as social studies learning media.

Field observations and interviews were conducted from 12 July to 12 August 2021. The results of field observations are as follows: the conventional social studies learning model is characterized by: learning is dominated by the lecture method, teachers lack mastery of the material and contextual learning, and teachers are less able to develop teaching materials, methods, and media lack of variety, monotonous teaching style, one-way communication interaction pattern, teacher's voice intonation does not vary, teacher's voice is not clear, a teacher does not motivate students to ask questions, a teacher does not respect students' opinions, teacher's position as resource persons who know everything, the teacher sees students only as objects of learning, passive students, students do not dare to ask questions, students lack focus and lack of attention.

Furthermore, interviews with teachers and students were conducted using the interview guide instrument. Interviews were conducted from 12 – 19 January 2022.

The results of interviews with teachers from 12 interview aspects were answered in detail in Table 1.

Table 1 Results of interviews with teachers' implementation of social studies learning is integrated with e-book learning media

No.	Aspects of the interview	Answer
1	What is the social studies curriculum used in this school?	Kurtilas (Curriculum 2013)
2	How is the material taught based on the curriculum used?	Pretty solid
3	What sources/media do you often use?	IPS Package Book
4	What is your response if the E-Book is used as a medium for developing the field of social studies at SMK?	Quite interesting
5	What is your response regarding E-Book-based learning media as one of the social science learning media that has the technology and is well known to students?	Very helpful and atmosphere at Distance Learning is like now
6	Has the school where you teach ever conducted training on E-Book-based learning media skills by teachers?	Never
7	What is the teacher's response if this E-Book-based learning media training is often held?	Very good, often do better
8	If E-Book learning media skills training is held in schools, how will it affect students' critical thinking and teaching creativity in social studies learning?	Very supportive online learning activities
9	With the development of social studies learning media based on E-Books, can the assessment of these three aspects be applied?	Can be applied
10	Do you have a special desire to have skills in making E-Book learning media?	Frequented for E-Book training to support online learning
11	What obstacles do you face to have the skills to make E-Book learning media?	Signal and teacher's ability to operate the application
12	What are your suggestions/inputs for developing inquiry-based social studies digital books to improve critical thinking for SMK students?	So that schools facilitate EBook Media for online learning and facilitate school hotspots with adequate signals

Table 2 Results of interviews with students about implementation of integrated social studies learning

No.	Aspects of the interview	Answer
1	Aspects of the interview	Yes
2	Are you happy with social studies?	Neither easy nor difficult

Continuation of Table 2

3	Do you think studying social studies is easy?	I want to be a historian
4	Do you intend to study further or even have aspirations to become a historian	Seldom
5	Do you often use social studies media/learning resources other than textbooks when teaching social studies?	It is easier to understand the subject matter with the help of the media
6	Do you feel a difference in learning social studies using sources/media with no sources/media?	
7	Have you ever used E-Books as a supporting medium in social studies learning?	More flexible and portable
8	What is your attitude/feeling about the frequent use of e-book learning media in social studies lessons?	To learn sometimes just to get rid of boredom
9	What is your purpose/purpose for using the E-Book media?	Very good to use in online learning
10	How do you feel when you often use e-books in learning?	E-Book media is more efficient, effective, and flexible and portable for online learning.

Table 2 gives detailed aspects of the interviews with students.

Furthermore, the research data obtained using the documentation method and the research instrument is a list of documents in the form of a grade VII social studies subject book from a social studies teacher in the Sukoharjo Regency. The following information is obtained: the pretest scores of 32 students who got score over the Minimum Completeness Criteria are only 12 students, and whose score is below the Minimum Completeness Criteria, there are 20 students with a Minimum Completeness Criteria of 70, while the post-test scores of 32 students who get scores score over Minimum Completeness Criteria are 29 students and those whose scores are below the Minimum Completeness Criteria are only three students. Concerning character values based on students' personal notebooks obtained from the BK teacher, information was obtained from 32 students for one-month attitudes, behaviors, and actions that did not match the character values: discipline, order, courtesy, honesty, responsibility, independence, cooperation, caring, and democracy. Attitudes/behaviors and actions in the form of joint zoom are often late; students do not do assignments; homework is done by someone else. Students take school equipment and do not return it to its place. When asked to pray, their behavior is not serious and imposes their opinion on discussions.

4.2. The Development of Inquiry-Based Digital Book Teaching Materials

The development of inquiry-based digital book learning can improve critical thinking in social studies learning. The development research model described in [19], consisting of 10 steps, was used in the research. The step of dissemination is subdivided into three main steps: a preliminary study, model development, and product testing [24]. The type of development research that the researcher uses is procedural development, namely developing learning model innovations using procedures/syntax/steps that are systematically arranged based on theoretical studies and experience in the field (empirical) [24].

After going through a series of validity tests by experts, namely model experts, linguistic experts, and development experts, the research steps were arranged as follows:

4.2.1. Preparation/Component Stage

1. *Reviewing:* Observations of the historical and social studies learning process in State Vocational High Schools were associated with relevant learning theories.
2. *Analyzing the need for digital book media development:* This analysis is needed to determine what steps will be taken and what kind of e-book will be developed.
3. *Selecting:* The selection was based on discussions with material experts who were considered to know more about the Social Sciences History of Vocational High School and the characteristics of the material to be developed.
4. Preparing digital book guidelines that will be developed in connection with the Social Sciences learning tools for high school history.

The application of inquiry-based digital book learning to improve critical thinking is divided into three stages, namely (preparation, implementation, and closing).

4.2.2. Implementation Stage/Content

1. Collecting and compiling materials, then designing the e-book media and designing a questionnaire that will be used to collect media validation data and user responses to the developed e-book, producing e-books in accordance with previously made designs, and conducting product trials.
2. Testing that was carried out three times.
3. The input obtained during the testing and verification will be used as input to improve or revise the e-book created.

4.2.3. Closing Stage/Result

1. Students can still access the Social Sciences history learning E-book using media outside the classroom.
2. Students do pretest and post-test to compare student learning outcomes before and after learning using e-books.

4.3. Improving Critical Thinking Skills

From 290 samples, we then analyzed using Smart-PLs. The success of the social studies learning process is largely determined by integrated learning components: teachers, students, curriculum, objectives, teaching materials, learning models, methods, strategies, media, facilities, and infrastructure, learning environment, and evaluation. If one of the components is not implemented, the success of the learning process is less than optimal. We found it necessary to develop an inquiry-based digital book learning. This approach complies with the provisions stipulated in the 2013 curriculum, which emphasizes that all subjects develop media to facilitate learning activities.

According to the findings in the field, learning is still done conventionally with very complex indicators because it is necessary to develop learning media. In this study, the researcher chose the development of inquiry-based digital book learning. This model combines two models from [16] and [17]: the inductive reasoning development model and the thinking skills model. The reason for this research is that no single model is the most powerful and most appropriate to use in the delivery of subject matter because each model has its own advantages and disadvantages. Therefore, combining two or more learning models will complement the advantages and disadvantages of one method with another.

Information was obtained that each supports the implementation of the social studies learning process but is still less than optimal in various aspects. Likewise, it can be seen from students' absorption before the development of inquiry-based digital book learning was implemented. This is evidenced by the pretest scores of most students under the Minimum Completeness Criteria. On the contrary, after the development of inquiry-based digital book learning was implemented, it was seen from the post-test scores of students. The majority are above the Minimum Completeness Criteria. Many students' attitudes, behaviors, and actions do not reflect the understanding of social studies material before the application of inquiry-based digital books. On the contrary, after implementing the development of inquiry-based digital book learning, there is a significant change in students' attitudes, behaviors, and actions that reflect an understanding of social studies material.

5. Conclusion

After the development of the inquiry-based digital book and implementation of the proposed learning, there has been a significant change in students' attitudes, behaviors, and actions that reflect an understanding of social studies material. However, social studies learning was implemented conventionally for Class X Vocational High School students in the Sukoharjo district. It did not describe students' ability to master social studies material, so developing inquiry-based digital studies book learning is necessary.

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