The Development Digital Book for Vocational High Schools

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ABSTRACT--- The development of the world of information and technology has increasingly made its own challenges in its use. For industry, this development is highly utilized in increasing competitiveness in the industrial era 4.0. The development of information technology must be utilized as well as possible in various fields of education. The low utilization of information technology can be seen when the learning process has not utilized the facilities that have been owned by schools, teachers and students. Therefore, information technology-based media is needed. Development with research and development methods. The results of the content experts an product validation showed that the sigil-based digital instructional teaching content were very good, which included four assessment indicators, namely: the substance of the content with syllabus, the relevance of the content, the content of the product, and its benefits. The results of the user assessment indicate that the sigil-based digital teaching content is very good.

Keywords—Development, Digital, Book.

I. INTRODUCTION

Education in general is the effort to advance the growth of character (inner strength, character), intellect and growing children. Thus education has an important role in encouraging students to get inner happiness. So, from that education must have clear objectives. [1]. Vocational High School as one of the formal education institutions that aims to produce graduates who are ready to use in order to work in the world of industry well, independently and creatively. Vocational education is education that prepares students to work in a particular field of skill or expertise. The learning process carried out by educators is expected to take place interactively, inspirationally, pleasantly, spur new challenges or stimulate students to always seek information, provide motivation for students to actively participate, and provide sufficient space for initiatives, creativity and independence according to their talents, interests and psychological development of students and develops according to their talents and interests.

The use of digital teaching contents can be used as learning contents to increase students 'interest and motivation so that students' attention to learning content can be increased, through digital teaching contents, teachers can present abstract content into concrete or tangible content. So that students easily understand and can eliminate verbalism [2]

Digital teaching contents can be accessed and owned by students through intermediaries, android smartphones, blackberry, iphone, computer or others. The lecture method and discussion cannot be repeated continuously when students have not understood the content that has been delivered. Teachers as lecturers will fatigue and even boredom when the content is taught, students do not understand the content of the content and the content taught to students will change its delivery when repeated.

In addition, without the support of digital teaching contents students will have difficulty looking back and relearning the learning that has been given without being explained by the teacher, students are only used as objects and the teacher becomes the only source of information for students so that the learning process runs in one direction and no interaction between teachers and students. When viewed from these problems, it takes digital teaching contents that can support the communication process in teaching and learning in the presence of multimedia so that it can facilitate students to understand the contents of the content delivered by the teacher. Use of digital teaching contents by utilizing learning tools that contain content, methods, boundaries learning contents, instructions for learning activities, and exercises in this case using the sigil software program. Given the importance of instructional teaching as a means or tool to achieve learning success, it is necessary efforts to compile or develop teaching materials to assist students in learning independently so learning not merely teacher-centered.[3]. E-books are gaining wider interest since the introduction of portable electronic reading devices and software-based readers that provide users with more realistic book reading experiences. [4]. E-books have gained broader interest since the introduction of portable electronic reader and software-based readers that gave users a more realistic reading experience.[5]

Learning contents are all things that become the contents of the curriculum that must be mastered by students in order to achieve basic competencies in order to achieve competency standards for each subject in a particular education unit [2]. Teaching contents are a set of learning tools or tools that contain learning content, methods, boundaries, and ways of evaluating which are designed systematically and interestingly in order to achieve expected goals, namely achieving competence or sub-competence in all its complexity[6]. The definition above illustrates that a teaching content should be designed and written with instructional rules because it will be used by the teacher to help and support the learning process.

Learning content in essence is the messages we want to convey to students to be mastered. Message is information that will be presented either in the form of ideas, data / facts, concepts and so on, which can be in the form of sentences, writings, images, maps, or signs. Electronic books support students. [7]

Emergent literacy development The message can be conveyed through verbal or nonverbal language, the message conveyed must be understood by students because when it is not understood the message will not be meaningful information [2]. Experimental lesson content is one form of presentation of individual learning content, so that the content is packaged to be studied independently, there are several characteristics of this programmed subject matter, namely 1) Subject content is presented in the form of units or smallest parts, 2) Demanding student activities, 3) Knowing immediately after each study subject matter.

The packaging of subject matter through modules as learning content is independent, so the subject matter is packaged in such a way that through the module students can learn independently without being bound by time, place, and other things outside themselves.

II. METHOD DEVELOPMENT OR RESEARCH AND DEVELOPMENT (R & D).

Research and development methods are to produce certain products, and test the effectiveness of these products. To be able to produce a particular product, it needs effectiveness that is needs analysis and to test its effectiveness so that it can function in the wider community, research is needed to test the effectiveness of these products. So research and development are longitudinal (gradual can be multi years).[7]
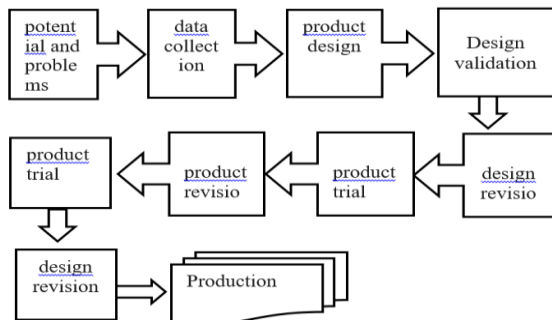

Fig 1. Research and Development

The subjects in this study were 2 (two) content experts, 1 (one) teaching content expert and vocational school students (two) content experts consisting of lecturers and vocational high school teachers who were experts on subjects and digital teaching contents experts were lecturers who taught or have skills in multimedia learning. In addition, vocational school students are respondents to digital teaching contents developed.

Analysis of data using a scale of measurement, scale of measurement is an agreement that is used as a reference to determine the short length of the interval that is in the measuring instrument, so that the measuring instrument when used in measurements will produce quantitative data.[8]. Scale of measurement, the value of variables measured by certain instruments can be expressed in the form of numbers, so that they will be more accurate, efficient and communicative.[7] The instrument in this study uses a Likert scale. Likert scale is used to measure attitudes, opinions, and perceptions of a person or group of people about social phenomena. The variable to be measured is described as a variable indicator. Then the indicator is used as a starting point for compiling instrument items which can be in the form of statements or questions. The rating (rating scale) of instrument items is made in intervals of 1-4 with the criteria

Table 1: Instrument measurement scale

No	Alternative answers	Score
1	very decent/very good	4
2	Well/worthy	3
3	Enough	2
4	Not good	1

Then the scores obtained from the data about the validation material of teaching materials and teaching materials were analyzed to obtain the class intervals. Following is the description of the formula. [9].

$Ji = (t–r) / Jk$

Information:

Ji = interval distance

t = The highest ideal score on a scale

r = The lowest ideal score on a scale

Jk = Number of interval classes

Then: Interval Distance = $(4–1) / 4 = 0.75$

So that the classification of the results of the media evaluation developed can be seen in table 2

Table 2: Classification of Assessment of Digital instructional teaching

No	Skor akhir	Klasifikasi
1	1,00 - 1,75	Not good
2	>1.75 - 2,50	enough
3	>2,50 - 3,25	Good/worthy
4	>3,25 - 4,00	very decent/very good

The formula above, the class interval validation of teaching materials and teaching material software in percentage can be described in table 3.

Table 3. Percentage scale

Precentage scale	scale	classification
0 -39 %	1	Not good
40 -55 %	2	Enough
56 -75 %	3	Good/worthy
76 -100 %	4	very decent/very good

III. RESULTS AND DISCUSSION

Analysis Results

Reviewing the problem is done by interviewing one of the

teachers who teaches the subjects of the wheel drive shaft and observations in the class. Based on the interview with the teacher, information was obtained that: 1) The low interest in student learning towards wheel drive shaft subjects, 2) The low learning achievement by vocational students caused by the use of mobile phones when the teaching and learning process took place, 3) The absence of varied teaching materials, 4) students have difficulty repeating learning material, because they do not have teaching materials that are simple and can be carried everywhere. Meanwhile, based on observations made in class, it is very clear that the class conditions are not conducive. This is because teachers pay less attention to how to convey material that is more interesting and varied. This process aims to prepare materials that can be used to make products to be developed. Reviewing learning needs is done by observing and analyzing learning objectives, students and teaching materials. A review of learning objectives is carried out by looking at the description of the subjects and the applicable curriculum. Student review is carried out by observing the habits of students during the learning process. While the review of teaching materials is done by looking at syllabus and reference books on vocational subjects.

Design Results

After reviewing various problems faced in learning, for example the Wheel Drive Axis subjects, determine alternative solutions and analyze the objectives, learning material and habits of students, then design. In this design stage compile the framework of the program structure and the design of the multimedia interface. At this stage, the preparation and assembly of teaching material pages is carried out, which includes writing text, creating a table of contents, making and installing images, and installing video and audio. The production of ePUB-based digital teaching materials uses the Sigil 0.8.1 Multi-Platform ePUB software, with the help of other software programs such as Microsoft Power Point, Microsoft Word, Win Movie Maxer Video, HandBrake, Prestigio and Readium eReaders.

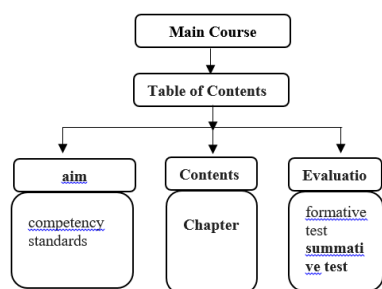The results of the design framework in the form of program structure can be seen in figure 2 below

Fig 2. Product Design

Validation Data Analysis

The validation data of digital teaching materials experts in the indicators of display of teaching materials is 87%. The validation indicator consists of two with each indicator getting a percentage of 100%. If the validation results are averaged 100%, so if seen in the interval table the results are very good. The validation of digital teaching materials

experts in the indicators of using images, sounds and videos was 91%. Validation consists of 4 with each indicator gaining a percentage of 100%, 100%, 100%, and 75%, if the validation is averaged 93.8%, so if seen in the interval table the result is "very good". Data validation of digital instructional teaching in the operating system indicator is 87.5%. The validation indicator consists of 2 aspects with each indicator gaining 75% and 100%, if the validation is averaged 87.5%, so if seen in the interval table the result is very good. Then the validation of digital instructional teaching in the benefit indicator is 87.5%. The validation indicator consists of 2 aspects with each getting 75% and 100%, if seen in the interval table the result is "very good". If the four indicators are averaged, then get a percentage of 88 %, so if seen in the overall interval table the result indicator is very good. The results of validating digital instructional teaching when presented in a bar chart can be seen in Figure 3 below.
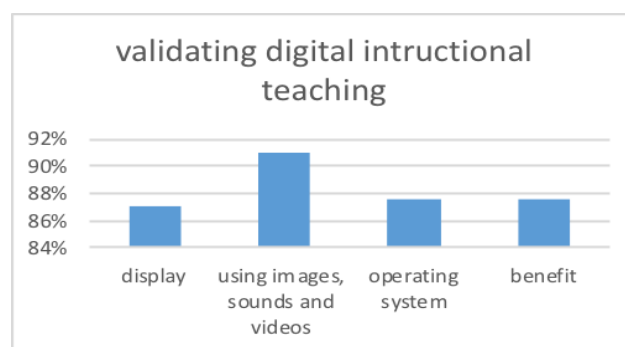
Fig 3. Bar Diagram of The Validation Analysis of Digital Instructional Teaching Experts

Validationexpert of content rate substance indicator with syllabus is 86%, the validation indicator consists of 3 (three) with each indicator getting a percentage of 100%. If the averaged validation of the results gets a 100% percentage, so if seen in the interval table the results are very good. relevance indicator is 75%, the indicator consists of 4 (four) with each of them having a percentage of 75%, 72.5%, 75%, and 75%, if the validation averages a 75% percentage, so if seen in the interval table the results are good. Based on the content validation data in the content indicator is 83.3%, the validation indicator consists of 4 (four) with each indicator gaining a percentage of 100%, 75%, 75%, and 87.5%, if the validation is averaged percentage of 83.3%, so that when viewed in the interval table the results are very good. The benefit validation in the benefit indicator is 87.5%, the validation indicator consists of 4 with each indicator gaining a percentage of 87.5%, 87.5%, 87.5%, and 87.5%, if the validation is averaged percentage of 75.5%, so when viewed on the interval table the results are good. If the four indicators are averaged, then get a percentage of 87.5%, so if seen in the overall interval table the outcome indicator is "very good". The results of validating digital instructional teaching when presented in a bar chart can be seen in Figure 4 below.
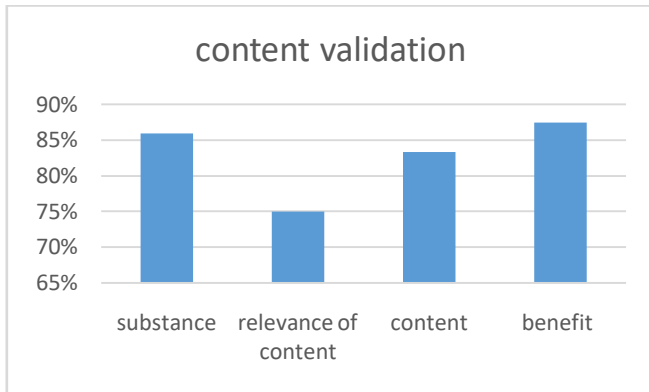
Fig 4. Bar diagram of content expert validation analysis

Fig 6. Bar diagram of a large group trial validation analysis

Based on students' responses to digital example wheel drive learning materials developed in the trial of the little group, the results were good. Student responses are given in the form of questionnaires with 10 (ten) assessment indicators, then divided into 5 (five) aspects whose results are aspects of relevance of content 80%, content 83,333%, ease of operation 80%, navigation 85%, layout 85 %.

If the five indicators are averaged, then get a percentage of 83%, so if seen in the interval table the result is "very good". The results of the validation of user analysis of digital teaching materials when presented in a bar chart can be seen in Figure 5 below
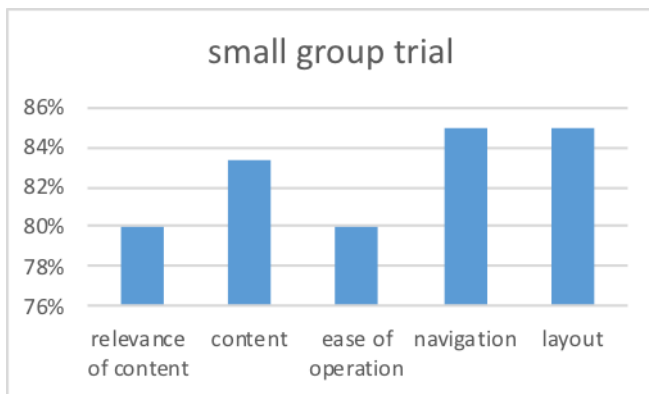

Fig 5. Bar diagram of a small group trial validation analysis

Based on student responses to digital teaching materials, examples of wheel drive shafts were developed in large group trials. show good results too. Student responses are given in the form of questionnaires with 10 (ten) indicators of the same assessment, then divided into 5 (five) aspects whose results are aspects of material relevance (93.33335%), content (81.67%), ease of operation (84.12%), navigation (84.5833%), layout and layout (87.08335%).

If the five indicators are averaged, then get a percentage (83.92%), so that when seen in the interval table the result is "very good". The results of the validation of the user analysis of digital instructional teaching when presented in the bar diagram can be seen in Figure 6 below
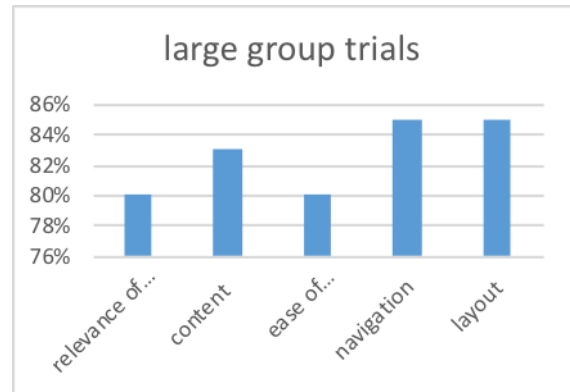
After passing through various processes, digital teaching materials as examples of sigil-based wheel drive shafts have been developed. Development of digital teaching materials is carried out within 4 (four) months. The first process begins with a review of learning problems and learning needs followed by the design phase. Digital instructional teaching are designed to present material and products at Magelang Ma'arif 1 Vocational High School. This digital teaching material also presents text, pictures, evaluation questions, and videos that can be learned more freely whenever and wherever by students. This digital teaching material can later be disseminated to students and teachers. This will make the teacher easy to provide material to students and also students can learn first, before the teacher provides the content.

When viewed in general, the digital wheel drive instructional learning with the developed sigil software has advantages in terms of a simpler appearance, easier to carry everywhere, can be run on an Android mobile phone, no internet connection is required, and usage is very easy, so it is not needed long time to master it.

Thus,digital instructional teaching book (epub) l, is one alternative same with above a instructional teaching for students with the development of information technology that is very advanced.a document reading interface that enhances existing digital reading interactions by adopting effective elements of paper interaction, and combining those with digital enhancements. [10]. Model of online learning for the learning media course could increase the learning activity and the students can learn independently with the existing technology. [11]. States that professional teachers make it possible to include the correspondence of the original learning environment with the needs of digital natives, in order to maintain the fulfillment of the success of your contemporary mission.[13]

IV. CONCLUSION

Based on the results of research and discussion, it can be concluded that: The procedure for developing sigil-based digital instructional teaching example on Wheel Drive Axis subjects is a) identification of potential and problems, b) data collection, c) making product design, d) design

validation by digital instructional teaching experts and content experts, e) design revisions, f) product/ small group trials, g) product revisions, h) field trials, i) product revisions / field trials, j) mass production.

Apart from that, the procedure for developing digital instructional teaching is supported by a number of supporting software and hardware a) Sigil Software, b) Microsoft Office Word Software, c) Microsoft Power Point Software, d) Win movie maker, e) Software Software handbrake, f) Prestigio eReader Software, g) Readium Software, h) Android Mobile Hardware, and i) Laptop or Computer Hardware.

The results of the assessment of the example of sigil-based digital instructional teaching, the developed Wheel Drive Axis subjects show that digital teaching materials are suitable to be used as learning resources, by multimedia experts indicating that the sigil-based wheel drive digital teaching materials are very good with an average rating rating of 92, 5% which includes four aspects of assessment, namely: display of instructional teaching, use of images, sound and video, operating systems, and benefits. So according to the scale table the percentage is categorized as "very good".

The results of the material expert's assessment showed that the sigil-based digital instructional teaching were very good with an average percentage of 87.5%, which included four aspects of assessment, namely: substance of content with syllabus, relevance of content, content, and benefits. So according to the percentage scale table it is categorized as "very good".

The results of the user assessment show that the sigil-based digital instructional teaching is very good, with a percentage of 83%, in the trials of little groups and percentages of 83.92% in big group trials covering 5 aspects, namely: relevance of content, content, ease of operation, navigation, layout and layout. So according to the scale table the percentage in this assessment is categorized as "very good"

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Author-1 Photo

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Author-2 Photo

Second Author personal profile which contains their education details, their publications, research work, membership, achievements, with photo that will be maximum 200-400 words.

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Third Author personal profile which contains their education details, their publications, research work, membership, achievements, with photo that will be maximum 200-400 words.