Development of Richpeace Software-Based e-Modules on Digital Clothing Pattern Making Competence

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Article Info	Abstract
	Mastery of computer aided design (CAD)-based design software to make fashion patterns for vocational students is very necessary, so that there is a conformity of competencies required by industry. One of the characteristics of 21st century learning is the integration of information and communication technology (ICT) in learning. Specifically, this research aims to: 1) develop richpeace software-based e-module; 2) analyze the feasibility of richpeace software-based e-module; and 3) analyze the effectiveness of richpeace software-based e-module to improve the competence of making digital fashion patterns for vocational students in the fashion study program. The research method used is Research and Development (R&D). The feasibility and practicality validation analysis used the intraclass correlation Coefficients method with the help of SPSS v.19 software, while the analysis of the effectiveness of the developed e-module used the t test. Based on the results of data development and analysis, the resulting richpeace software-based e-module was declared very feasible by material experts with a score of (97.0) and very feasible by media experts with a score of (96.3). The practicality of the developed e-module was also tested by the fashion teacher, with very practical results (97.5). The e-module that was developed was also tested for effectiveness by using the t-test, with the result that there was a significant difference before and after using the e-module, with an increased value of 18.5 and a p-value of 0.000), and had an N-Gain value of 0, 93 which means that the developed e-module is very effective. Based on the results of the study, it can be concluded that the developed e-module is very feasible, very practical and very effective to improve the competence of making digital clothing patterns for vocational students in the fashion study program.

INTRODUCTION

The development of technology in industry is growing rapidly where the technology used is increasingly advanced and sophisticated, especially in the fashion industry. Industry applies technology both in pattern making and in cutting materials to be more effective and efficient. The fashion industry plays a role in the development of the national economy, which fulfills one of the fourteen creative industry groups, so that it can absorb a large number of workers, mainly graduates from schools with a fashion basis. Technology has a role and use in the industrial world to encourage efficiency in production costs and increase industrial output and optimize resources. The use of technology in the fashion industry by utilizing Information and Communication Technology (ICT). The use of ICT is also applied to the fashion industry, which utilizes computer aided design (CAD)-based design software to create fashion patterns.

Education is the primary thing in ensuring the continuity and development of a nation, and plays an important role in seeking Indonesian human resources who believe and have faith in God. Education in Indonesia, which still really needs to be developed, is mainly education in vocational high schools (SMK). Many challenges are still faced in the implementation of education in SMK, especially regarding the output of SMK graduates, namely the high percentage of graduates in the engineering field who have not found job. Vocational High School graduates are supposed to be suppliers of manpower for the industrial world, but in reality, Vocational High School graduates are not able to meet the growing needs of the industry, both in terms of technology and human resource competencies. Competence of students is required to meet the needs of industry.

Twenty first century learning is expected to provide 21st century skills. It is learning that aims to produce graduates who are intelligent and having good character. Graduates who have attitudes, knowledge and skills that are up to date. They are able to face the challenges of the 21st century and contribute adequately to the development of world civilization. These skills include the ability to think critically and solve problems, innovate and be creative, communicate and collaborate, and have digital literacy skills (information literacy, media, and technology) or often known as 4C (critical thinking and problem solving, creativity and innovation, communication and collaboration).

One of the characteristics of 21st century learning is the integration of information and communication technology (ICT) in learning. Students are required to be able to master ICT as a tool in learning, it is no longer a material that must be studied, but ICT is a tool used in learning something, namely as a tool that is in accordance with what has been applied to industry, so that the main task of teachers in 21st century learning is as facilitators so that they are required to have competence in using technology. There are still many educational institutions, especially Vocational High Schools (SMK), especially fashion study programs that have not integrated the use of information technology into their subjects, so there is an imbalance between graduates and the industrial world.

Graduates of fashion study program in vocational high school will later be needed in the fashion industry, especially in the fields of pattern making competence or pattern making and grading fashion patterns or markers either manually or computerized where graduates will work later as operators in pattern making. The qualifications needed in the fashion industry are: (a) vocational education in fashion, (b) understanding of fashion patterns, and (3) mastering software for markers (https://lowongan.trovit.co.id/marker-garment-jobs). The competencies needed by the industry can be fulfilled with the availability of infrastructure and the competence of teachers in providing material.

Student competences are still not fully in accordance with competences in the industry such as pattern making using CAD where it is already used in industry. Pattern making is done using an application on a computer to make patterns and grade patterns. Meanwhile, in schools, pattern making is still mostly done manually. The lack of innovative learning media made by teachers is one of the obstacles. Teachers

are still not able to be the only learning source in using the CAD system to make pattern, so that pattern making in schools is still using the manual system.

SMK Addin As Shiddieq is a vocational high school that has a fashion study program. One of the functions of this fashion program is to increase creativity and provide supplies that are tailored to the needs of the industrial world to make fashion designs such as designing clothes, measuring, making patterns and sewing clothes.

Industrial clothing making is a subject that is expected to provide students with an overview of the skills needed in the industrial world, the purpose of this subject is to make clothing in accordance with the industrial fashion manufacturing system so that students have the knowledge, skills and meet the basic competencies of making clothing. In the subject of industrial clothing making, students are only taught the material for making industrial clothing manually. The use of information technology in this subject, especially in the industrial sector, can develop students' skills that will be useful when they become workers in the production department, and also their mastery the technology itself.

Industrial clothing making subject provides the practice of making clothes like in industry by making patterns manually and digitally with a grading system. The curriculum in this subject provides competencies that must be achieved. students can make clothing patterns manually and digitally with a grading system using software in learning. Students are taught to make patterns with a computer, then the finished patterns are graded according to the size needed, students are also taught how to make grading system patterns manually.

Based on the preliminary studies that have been carried out, learning activities on clothing pattern making in several vocational high schools have not been equipped with interesting media. Learning is carried out using conventional methods and pattern making is done manually. This method is still less effective, it takes a long time to prepare equipment such as rulers, pattern books, scales and equipment used in making fashion patterns. Conventional learning patterns

that are applied to clothing pattern making subject are still not able to improve students' competence in making clothing patterns. In pattern making that is done conventionally, not all students make mistakes. In the subject of making industrial clothing, students are still weak in grading patterns. It can be seen from the score of students which are still below the passing grade (70). The passing grade (KKM) of industrial clothing making subject is 75.

This is directly proportional to the competencies expected in the clothing industry, where students must be able to adapt to various technologies that exist in the industry. Manual pattern making and pattern grading take a long time, so the competencies that should be needed by students in obtaining further material are also less than optimal. This condition makes the teachers put some efforts in improving learning, such as the need for teaching media that helps teachers and students improving student's competence, making interesting and interactive learning activity, learning time must be shortened so that the teachers does not have to repeat in the material explanation.

Students experience many obstacles in learning to make industrial clothing, especially in making patterns and grading patterns both manually and using CAD applications, while teachers also have difficulty using digital patterns. Some of the teachers who took part in the digital pattern making training, still unable to make digital patterns (the results of UNNES training for teachers in the 2021). So the assumption is that students also experience difficulties similar to the difficulties experienced by teachers in making digital patterns.

Innovations in the development of teaching and learning facilities must be carried out continually, one of which is by developing e-modules that can be used as effective and efficient learning resources. The e-module that was developed contains materials for making digital clothing based on Richpeace which is equipped with a tutorial on making digital clothing. Digital pattern making using Computer Aided Design (CAD) with Richpeace program application. The advantage of this CAD system software from Richpeace is that it is open access and all tools can

be activated without trial period and can be accessed freely.

Based on those considerations, the researcher wants to develop an e-module based on Richpeace software to improve the competence of making digital clothing patterns for vocational students in the fashion study program. The urgency of the development of e-modules to be developed is based on several studies that conclude the impact of using e-modules or other ICT-based media as learning media. the use ICT learning media in learning can improve students' competence, forming good character and increase student motivation in learning, as well as improve student learning outcomes, especially in learning that is carried out remotely, in the era of the Covid-19 pandemic (Syahrial et all, 2019., 2020., Monica Fransisca et all, 2019., Dyah et all, 2018., Hersulastuti, 2019., Putri et all, 2021., Adriana et all, 2021., Hariyono et al, 2021., Nofha Rina, 2020., Prastyaningrum et all, 2017., Farihah et-all, 2020).

Based on the background of the study above, the problems that are going to be investigated in this research are: 1) how to develop e-Module based on Richpeace software to improve the competence of making digital fashion patterns for vocational students in the Fashion Design skill program; 2) how is the feasibility of e-Module based on Richpeace software to improve the competence of making digital fashion patterns for vocational students in the Fashion Design skill program; 3) how is the effectiveness of e-Module based on Richpeace software to improve the competence of making

digital fashion patterns for vocational students in the Fashion study program in industrial clothing subjects.

METHOD

The research method used is Research and Development (RnD). It is a research approach which is used to produce certain products and test the effectiveness of certain products (Sugiono: 2010). This study aims to produce a product to increase students' competence in making patterns digitally. This research and development aim to develop and validate a good educational product in the form of an electronic module that produces an educational product. According to (Sugiyono: 2009) need analysis and effectiveness test of the product can be functional in the community when research and development research methods are used.

One of the R&D research procedures developed by Dick and Carry (1996) is the ADDIE development model. According to (Warsita: 2011) the ADDIE development model is a development model based on an effective and dynamic system, and it supports learning media development procedures. Dick and Carry divides the stages of the development model into 5 stages, namely; (1) Needs analysis phase (Analysis), (2) Design phase, (3) Development phase, (4) Product testing phase (Implementation), (5) Evaluation phase. The stages of e-Module development with the ADDIE development model can be seen more clearly in Figure 1, below.
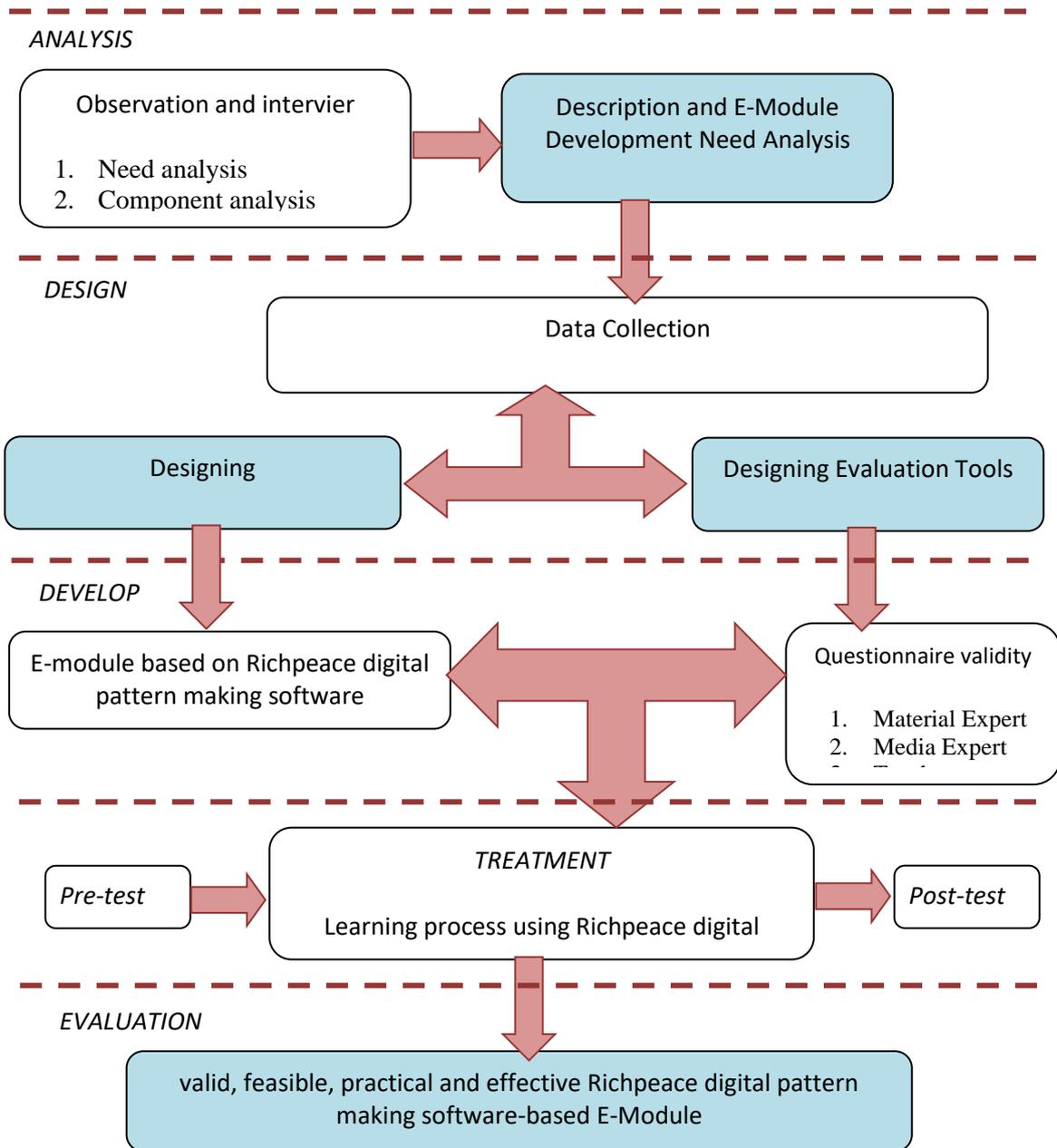
ANALYSIS

Observation and intervier
1. Need analysis
2. Component analysis

→ Description and E-Module Development Need Analysis

DESIGN

Data Collection

Designing ↔ Designing Evaluation Tools

DEVELOP

E-module based on Richpeace digital pattern making software ↔ Questionnaire validity
1. Material Expert
2. Media Expert

TREATMENT

Pre-test → Learning process using Richpeace digital → Post-test

EVALUATION

valid, feasible, practical and effective Richpeace digital pattern making software-based E-Module

Figure 1. ADDIE Model E-Module Development Procedure

The sample is a representative or part of the population studied. The population is the entire research subject (Suharsimi Arikunto: 2010). Sample research is research that draws conclusions as something that applies to the population (Suharsimi Arikunto: 2010). This study uses the entire population as a sample. The object of this research is SMK Addin As Shiddieq Pacitan in the field of fashion. Data collection was on 11th grade students that consist of 30 students.

Data collection techniques are the methods used by researcher in collecting the required data. The data collection techniques used in the research on the development of E-Modules based on Richpeace software to improve the competence of making digital patterns are 1) E-Module eligibility; 2) E-Module practicality; 3) E-Module effectiveness.

An analysis of the feasibility and practicality of the e-module by experts was carried out to determine the feasibility and practicality of

the Reachpeace-based e-module in the competence of making digital patterns that have been developed. Analysis of the effectiveness of the developed e-module was tested using the t-test assisted by SPSS v.19 software. This analysis is used to determine whether there is an increase in students' competence in the use of e-module by comparing the pretest and posttest scores. Furthermore, in order to find out the effectiveness of e-module used in improving student competence, the N-Gain formula was used.

RESULTS AND DISCUSSION

Development of Richpeace Digital Pattern Making Software-Based E-Module

a. Slide Stage

The Slide stage is a stage that shows the initial appearance of an e-module development product based on Richpeace software on the subject of Industrial Clothing Making. The initial product is the result of making an e-module prior to expert testing. The initial product of e-module development is made according to the Storyboard and Flowchart designs that have been prepared. The initial layout of the product, the start page and the main page of the e-Modul can be seen in figure 1a, 1b and 1c

| (1a) | (1b) | (1c) |

Figure1a. Title page; 1b. Homepage; 1c. e-Module Page

The e-Modul Homepage, as shown in Figure 1b, is the content of the e-Modul which begins with the title of e-Modul and the menu of the e-module. At the bottom center, there is a navigation button to enter the e-Module menu and a navigation button to exit the e-Modul application.

The Main Page, as shown in Figure 1c, is the main page that displays the main menu of the e-module, namely the contents of the created e-module. At the top there is the title of e-Module. The main page has 7 main menus, namely 1) profile menu, 2) introduction menu, 3) Richpeace

menu, 4) skirt pattern making material menu, 5) shirt pattern making material menu, 6) bibliography menu and 7) Back menu. The material menu contains the contents of the material to be studied. The back menu is a menu to return to the start page. Each menu can be clicked according to user needs.

Next, the e-Modul page displays a profile menu, as shown in Figure 2a, which is a menu that displays the profile of the e-Modul maker. Contains biodata and ID number, on this page there is a back menu to be able to return to the main page. The next page displays the Preface

menu as shown in Figure 2b, which is a menu that displays the introduction of the e-module created, the purpose of making the e-module and expectations after using the e-module. This introductory page has a back menu to return to the main page.

The next page of e-Modules displays the Richpeace menu (figure 2c), which is a menu that displays material about the Richpeace software application, this page contains material on the understanding of Richpeace software, the function of each software contained in the Richpeace software application. This page has an forward and back button. The forward button is used when the user wants to continue to access the material about Richpeace software, this next page contains material about the buttons used in making digital patterns contained in the Richpeace software (2d image). This menu contains 2 pages of Richpeace software material pages. The back button is used to return to the main page.

| (2a) | (2b) | (2c) | (2d) |

Picture 2a. Profile Page; 2b. Foreword; 2c. Richpeace menus; 2d. Pattern Making Menu

The contents of the next e-module, displaying a skirt pattern making material menu, is a menu that displays a sub-page of material for making skirt digital patterns. There are six menus on this page, namely: 1) basic competencies (figure 3a); 2) understanding of skirts (figure 3b); 3) grading the skirt pattern (figure 3c); 4) digital grading (3d image); and 5) evaluation (figure 3e), as shown in the figure below.
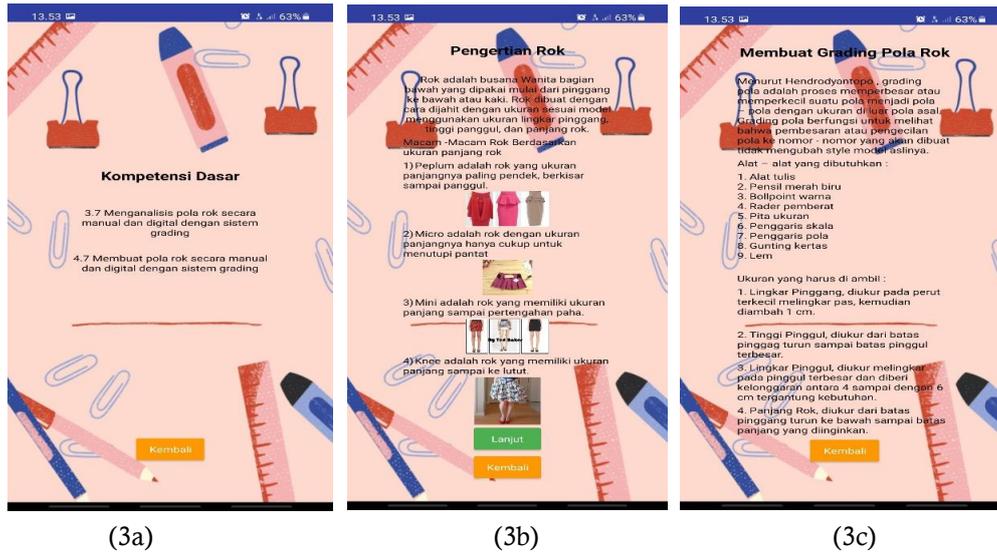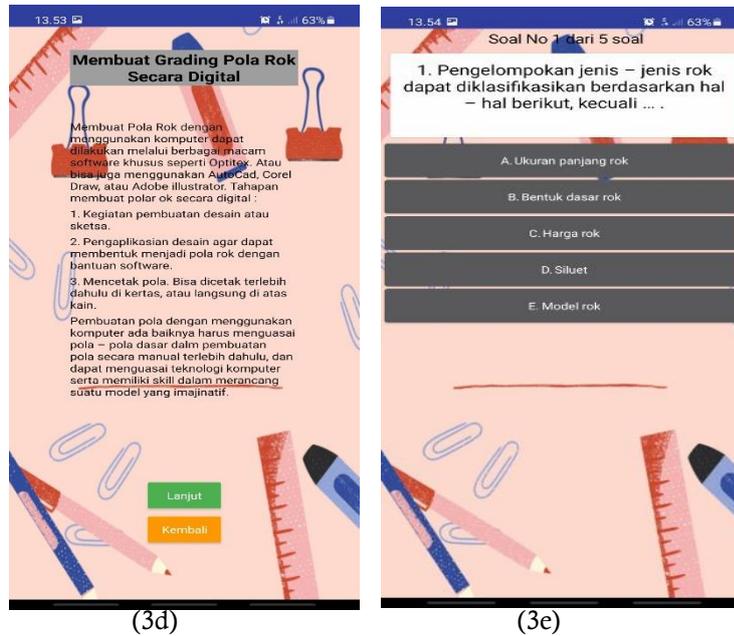
(3a)   (3b)   (3c)

Figure 3a. Basic competencies; 3b. Definition of Skirt; 3c. Skirt Pattern Grading

(3d)   (3e)

Picture 3d. Digital grading; 3e. Evaluation menu

The contents of the next e-Module display a menu of materials for making shirt fashion patterns. In this menu, there are 5 menu pages, namely: 1) basic competence menu (figure 4a); 2) understanding of shirt fashion (figure 4b); 3) various shirts (figure 4c); 4) digital grading (4d image); and 5) evaluation (figure 4e). More clearly, each menu illustration, can be seen on the pictures below.
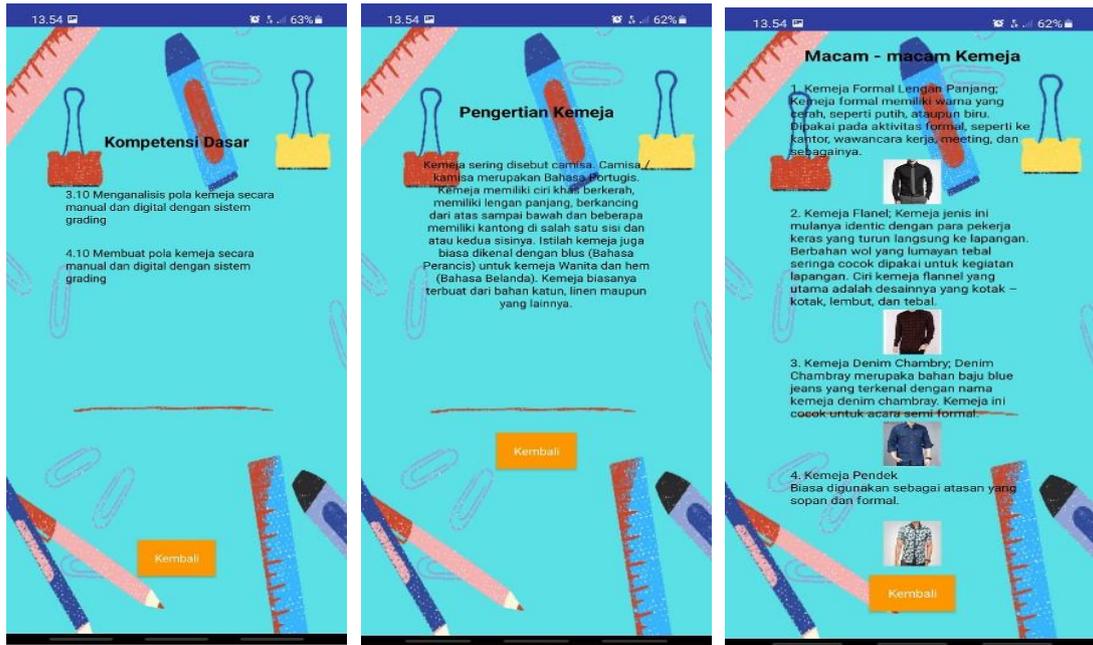
(4a)　　　　　　　　(4b)　　　　　　　　(4c)

Figure 4a. Basic competencies; 4b. Definition of Shirt; 4c. Kinds of Shirts

(4d)　　　　　　　　(4e)

Figure 4d. Digital grading; 4e. Evaluation menu

Bibliography menu, is a bibliography display that contains references to materials used in making the e-module. On this page, there is a back menu to be able to return to the home page. This page can be seen in Figure 5 below:
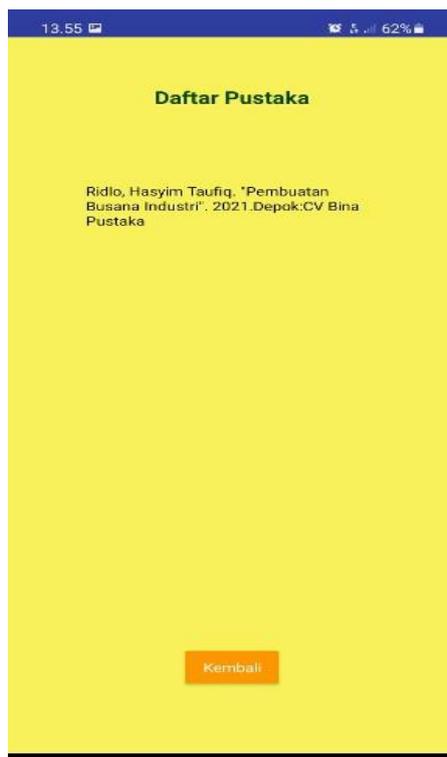
Figure 5. Bibliography page on E-Modul

b.   Mapping Stage

The Mapping stage is the stage of making the title and material in the e-module. The title included in the initial display of the e-module is "Richpeace Software E-module". The title of the e-module is arranged according to the selected subject matter based on the background of the problems at SMK Addin As Shiddieq Pacitan. The Mapping stage is also carried out by compiling subject matter in accordance with basic competencies and subject indicators for Industrial Clothing Making.

The material included in this e-module consists of 2 basic competencies, namely making a digital skirt pattern and making a shirt pattern digitally. The material in this e-module consists of an understanding of Richpeace software, understanding skirts and shirts, various kinds of skirts and shirts with pictures, digital pattern making with video tutorials, and evaluation after the user has learned the material.

c.   Database Using Stage

The Database using stage is the stage of entering images, videos, and sound effects on the video. The video tutorial is made first by recording video and then adding the sound which

is then entered into the e-module as a digital pattern making menu.

d.   Eventing Stage

The Eventing stage is the stage of providing an event or work order on the e-module menu button. This button is just a box with a work order menu to enter the main menu, Return menu is a work order so that the page display returns to the previous page, the forward menu is a work order to be able to forward the page to the next page, then the exit menu is a work order to be able to exit e-module app.

e.   Testing Stage

The Testing stage is the stage for testing the event function on each e-module page based on Richpeace software in the competence of making digital patterns. This test is carried out to evaluate whether the device is able to run properly. Testing is done by entering the application on some smartphone with different brand and type to see if the application is running well.

f.   Publishing Stage

The Publishing stage is the stage of publishing e-modules in the form of applications on smartphones, files that have been created on the Kodulor software, applications that can be

used to directly design learning media specifically for applications that will later be used on smartphones or Android. In this application, we can directly create media that has been designed to become an APK application. Then the link address can be sent via whatsapp or email so that users can directly install this e-module application.

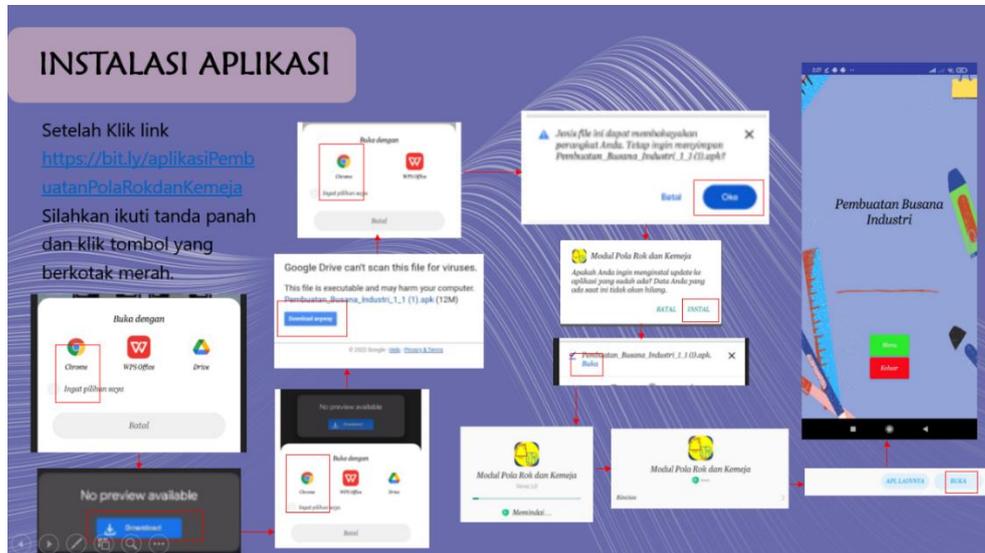The working steps in installing this application can be seen in Figure 6 below:

Figure 6. Stages of installing the e-module application

Validation, Feasibility and Practicality of E-Module

The next stage is the development of the e-module, validation and feasibility tests from material experts and media experts, as well as practicality tests from teachers of fashion study program.

a. Expert Validation

The testing tool used for the validation test of material and media experts is Intraclass Correlation Coefficients. The validation test was calculated using SPSS v.19 software. The material and media expert validation test were carried out in grade 11 of Addin As Shiddieq Pacitan Vocational School in the field of Fashion. The results of the calculation of the material expert validation test (table 1), media expert validation (table 2) and the validation of teachers (table 3) can be seen as follows:

Table 1. Material Expert Validation Test Results

No	Expert	Score	Average Score	P-Value*
1	Material Expert 1	97.4	97.0	0.006
2	Material Expert 2	96.5		

Based on table 1. the result of average value of the material expert validation test is 97.0 with a very feasible category. The result of material expert validation show that a p-value is 0.006 which means that the development of e-modules is relevant and feasible as a competency for making digital fashion patterns for vocational students in the fashion study program.

Table 2. Media Expert Validation Test Results

No	Expert	Score	Average Score	*P-Value**
1	Media Expert 1	96.3	96.3	0.006
2	Media Expert 2	96.3		

Based on table 2. the result of the average value of the media expert validation test is 96.3 with a very feasible category. The result of media expert validation shows that p-value is 0.006

which means that the development of e-modules is relevant and feasible as a competency for making digital fashion patterns for vocational students in the fashion study program.

Table 3. Teacher Validation Test Results

No	Teacher	Score	Average Score	*P-Value**
1	Teacher 1	98.1	97.5	0.005
2	Teacher 2	96.9		

Based on table 3, the result of average value of the teacher validation test is 97.5 with a very decent category (without revision). The result of the teacher validation shows that the p-value is 0.005 which means that the development of e-modules is relevant and feasible as a competency in making digital fashion patterns for vocational students in the fashion study program.

b. E-Module Feasibility

Based on the results of the feasibility test carried out through media experts, material experts and productive fashion teachers, it was found that the range of feasibility values was 4.21 - 5.0 which could be categorized as "very feasible" which means that the e-Module for making digital fashion patterns of vocational high school students is very suitable to be used as a learning medium in the learning process of making digital fashion patterns.

c. E-Modul Practicality

Based on the results of the feasibility test analysis carried out through media experts, material experts and teachers, it was found that

the feasibility value range was from 4.21 to 5.0 which could be categorized as "very practical" which means that the e-Module for making digital fashion patterns for vocational students is very practical to use as a learning medium in the learning process of making digital fashion patterns.

E-Modul Effectivity

Analysis of the effectiveness of e-Modules based on richpeace software to improve the competence of making digital clothing patterns for vocational students in the fashion study program was carried out by using a computerized T test using the SPSS v.19 program.

The t test is used to determine whether there is an increase in student competence in the use of e-modules by comparing the pretest and posttest scores to determine whether the e-module used is effective or not to improve student competence. The results of the T test calculations are as follows:

Table 4. T-Test Results

Treatment	N	Mean	STD	T	p-value*
Before	30	61.80	13.171	-10.915	0.000
After	30	80.30	5.694		

Based on table 4.7, there is an increase before and after with a difference of 18.5 and a p-value of 0.000, it shows that there is a significant difference in the value of student competence before and after using the e-module for making digital fashion patterns for vocational students in the fashion study program.

Furthermore, to calculate the effectiveness of the use of e-module N-Gain test is performed. Based on the average N-Gain normalization, a

value of 0.93 was obtained. The N-Gain value is then classified, described and can be categorized as a high normalization value, which means that the e-module is very effective as a competency in making digital fashion patterns for vocational students in the fashion study program.

Discussion

The development of Richpeace software-based e-modules in the competence of making

digital fashion patterns produces applications that can be installed on Android-based smartphones. This Richpeace software-based e-module can be used without having to install other additional software, making it very easy to use.

The results of this study are the same as the research of Izza Ariffatur R (2019) that the e-module made is suitable as a learning medium, the developed CAD learning e-module has proven to be effective in improving students' competences, this CAD learning e-module is very practical to use as a learning tool.

The feasibility of e-modules based on Richpeace software to improve the competence of making digital clothing patterns for vocational high school students of the fashion study program with an average validation test of material experts of 97.0 and media experts of 96.3 with a very feasible classification which means it is very good, so that the Richpeace software-based e-module needs to be maintained. The practicality of e-modules to improve the competence of making digital fashion patterns for vocational high school students of the fashion study program with an average teacher validation test of 97.5 with a very practical classification which means it is very good, so it is necessary to maintain Richpeace software-based e-module.

The results of this study are the same as the research of Izza Ariffatur R (2019) which produces an android-based e-module which is then used as a learning medium in making 3D images in the eye using CAD. The results of this study indicate that the e-modules are suitable for learning media, the CAD learning e-modules developed are proven to be effective in improving student competence, the CAD learning e-modules are very practical to use as learning media. The results of this study are also the same as Hamidah S.I (2018) with the results of making patterns with an effective CAD system based on an increase in students' knowledge about making fashion patterns. the performance results showed better results. Students also gave a high response to the training provided.

The effectiveness of Richpeace software-based e-modules to improve the competence of making digital clothing patterns for vocational high school students in the fashion study program

with an average N-Gain score of 0.93 with a high classification which means that the Richpeace software-based e-modules are very effective in increasing the competence of making digital clothing patterns for vocational high school students in the fashion study program, so it is necessary to use and maintain an e-module based on Richpeace software.

The results of this study are the same as the research of Farihah et.al (2020) where the use of e-modules gave very good results, 90.54 student responses in the use of e-modules providing criteria for strongly agreeing. Student learning outcomes with the use of e-module construction patterns gives an average result of 81.25 in the high category. The results of this study indicate that the use of e-modules can attract attention, increase interest in learning and motivate students, so that e-modules are declared to be effective as a medium for learning construction patterns. This research is also the same as research by Nur Ismiyati (2018) that the module made is declared suitable for use in learning to make fashion patterns by experts, users and students. Also similar to the research of Tien Aminatun, et al (2016) which produced a product in the form of an Android-based e-module with research results showing that the e-module made was effective in improving students' thinking skills.

CONCLUSION

Based on the results of research and discussion on Richpeace Software-Based E-Module Development, the following conclusions are obtained:
1. The development of Richpeace software-based e-modules in the competence of making digital fashion patterns produces applications that can be installed on computers or laptops as well as Android-based mobile phones. This Richpeace software-based e-module can be used without having to install other additional software, making it very easy to use.
2. The feasibility of e-modules based on Richpeace software to improve the competence of making digital clothing

patterns for vocational high school students of the fashion study program with an average validation test of material experts of 97.0 and media experts of 96.3 with a very feasible classification which means very good, so that the e-module based on Richpeace software need to be maintained. The practicality of e-modules based on Richpeace software to improve the competence of making digital fashion patterns for vocational high school students of the fashion study program with an average teacher validation test of 97.5 with a very practical classification which means that it is very good, so it is necessary to maintain an e-module based on Richpeace software.

3. The effectiveness of Richpeace software-based e-modules to improve the competence of making digital clothing patterns for vocational high school students in the fashion study proram with an average N-Gain score of 0.93 with a high classification which means that the Richpeace software-based e-modules are very effective in increasing digital fashion patterns making competence for vocational high school student in the fashion study program, so it is necessary to maintain the Richpeace software-based e-modules.

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