



# Development of CAD Fashion Pattern E-modules Using Richpeace Software in Computer Pattern Making Course

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## ABSTRACT

Media is an important component in achieving learning objectives, as well as in the Computer Pattern Making Course which studies CAD fashion pattern making using Richpeace software. The results of initial observations revealed that 45% of students admitted that they had difficulty in finding references and reading sources about the Richpeace software, both in libraries, bookstores, and the internet, so they only relied on the material provided by the supervising lecturers. Based on the documentation of the grades list, there are 5,98% of students who still got an E grade because these students had never submitted assignments and did not take exams even though their presence is more than 50%. This is supported by the results of interviews with supervising lecturers who stated that one of the influencing aspects is motivation. The supervising lecturer also stated that there was a need to update a tutorial-based video that was more complete and more detailed but still interesting so that it will motivate the students who haven't understood about CAD material, to watch it repeatedly until they could. Therefore, development of e-module has to be implemented. This type of research is a Research and Development (R&D) with the purpose to analyze the procedures and eligibility results of e-module development by testing the product results to expert judgment in the form of material experts and media experts. The data collection methods are documentation and observation techniques. The development method took the 5 Stages of Using the Research and Development Method from Sugiyono which consists of potencies and problems, data collection, product design, validation, and revision. Based on the research that has been developed according to the procedure, the results are in the form of an e-module entitled "CAD Fashion Patterns Using Richpeace Software" as a way out of the problems that exist in the Computer Pattern Making Course. This e-module has been equipped with images, videos, hyperlinks along with direct access to the Yashinta Ramadhani Youtube channel with the QR code feature. Judgement by material experts obtained an average percentage of 97.02% and classified in the interpretation of "Very Eligible". The results of judgement by media experts obtained an average percentage of 93.63% and classified in the interpretation of "Very Eligible". So it can be concluded that the E-Module for Making CAD Patterns Using Richpeace Software is very eligible to be used as an alternative learning media in Computer Pattern Making Courses.

**Keywords:** *Learning Media, E-Modul Development, Fashion Pattern, CAD, Richpeace.*

## 1. INTRODUCTION

In the 21st century, education is becoming increasingly important to ensure the students to have learning and innovation skills, using media and technology, as well as the ability to work and survive using life skills [1]. Conventional education which is implemented by combining one or more learning

methods and which has an important role in the learning process is now starting to shift to e-learning. E-learning is defined as technology-based learning in where teaching materials are sent electronically to students using computer networks [2]. Teaching materials are virtualized into various formats so that they are more dynamic and interesting which can motivate students to go deeper into what they are learning. The rapid

development of technology has begun to provide educators with potency equipment. Education in the future triggers technological discoveries that enable active learning experiences for students [3].

Education shifted to technology influenced by evolution in the world of work and industry. Since 2011 the international world has been considered to have entered the 4.0 industrial era which is characterized by increased interaction, connectivity and boundaries between humans, machines and other increasingly diverse resources through information and communication technology [4]. The manufacturing industry sector absorbs a workforce of 18.25 million people, which contributes 14.72% to the total national workforce and requires a competent workforce, especially in mastering digital technology [5]. For the manufacture of fashion patterns themselves, a technology called CAD has been developed.

Computer Aided Design (computer-aided design) or CAD is a computer technology for the process of making designs and documentation. The existence of CAD helps and supports work so that it can be completed more quickly. CAD software for designing fashion and software for making patterns are studied and practiced in preparation for facing the industrial world [6]. One of the CAD software, namely Richpeace, comes from a CAD/CAM company for garments based in China. Richpeace can be used freely by those who organize fashion expertise programs or the public who want to learn CAD for garments. This software can be freely installed on students' computers or laptops so that it can encourage student learning independence [7]

CAD (Computer Aided Design) is computer software and hardware technology for the process of making designs and documentation [8] Advances in science and technology encourage the birth of CAD, especially in an era where computers are more popular and easier to operate, gradually make humans realize that they have a dominant relationship with computers [8]. The large number of CAD/CAM technology providers shows that the need for automation and computerization technology in the fashion sector has become a necessity of the times. [9] stated that the advantages of using CAD are increasing production speed, improving ergonomics, increasing integration or assimilation during production, increasing accuracy and precision in production, and facilitating product lifecycle management.

In the Fashion Education Study Program at Semarang State University there is a Computer Pattern Making or some call it CAD (Computer Aided Design). Students are expected to be skilled at making patterns, grading and marking clothes digitally using computer pattern software. The introduction of CAD technology is carried out to produce graduates who are ready to be absorbed into the work field. Learning in practical courses, ideally students can understand the work procedures. The role of

the media is very important to facilitate students in understanding the material in detail. Media variations make the learning process more interesting and not boring. Selection of the right media can maximize the potency of students and is beneficial for educators in facilitating the material delivery.

Learning media is an important component in teaching and learning activities. Fikri and Madona [10] in their book entitled *Development of Interactive Multimedia-Based Learning Media* stated that learning media is a medium obtained by someone in conveying messages from the person who delivers the message (sender) to the person who receives the message correctly (audiences). In practice field, those who become senders are teachers or lecturers and those who become audiences are students. According to Nurdyansyah [11], everything that can deliver messages is able to stimulate the thoughts, feelings, and safety of students, so that it can encourage the creation of processes in themselves, which is learning media.

Waidah [12] also stated that the teaching and learning process becomes more effective, efficient and fun by providing material using creative media as a learning medium. Learning media can also help students increase interest, motivation, understanding, presenting the data in an attractive and reliable way, facilitating interpretation of data and condense information [13].

Learning both at school and at university requires media to streamline the achievement of learning objectives. Muhali [14] stated that an important reason for focusing students on 21st century skills in the education system is to be able to keep balance with changing times. Determining the right learning media is one way to help to achieve these goals. One of the learning media is the module. Modules are packaged systematically and attractively with a range of materials, methods and evaluations that can be used independently to achieve the expected competencies. In the 21st century, modules are developed into electronic modules or e-modules that support e-learning. E-module is a type of independent teaching material that is made in electronic form and arranged systematically [15]. Through its multimedia, e-modules can make learning activities more enjoyable both studied independently and together in the class. The contents can be inserted with pictures, music, videos, graphics, animations and more. This can stimulate more senses to further maximize the absorption of information.

E-modules are individual learning; therefore, efforts are needed to involve as many characteristics of students as possible to optimize learning media planning. Learning experiences in e-modules must also be provided to help the students to achieve learning objectives as effectively and efficiently as possible, and to enable students to do active and independent learning. The use of e-modules can promote active learning [16]. E-module

as a learning medium has several characteristics that can increase learning motivation. According to Nufus [17] e-modules are arranged systematically and can present material in a coherent manner, which can be used for self-study with communicative language. An understanding of the e-module characteristics and its constituent components is needed so that the e-module is interactive. The characteristics of the print module can be adapted or applied to e-module development [18].

E-module development can be said good and eligible if it fulfills the determined criteria. These criteria are used as characteristics of an e-module. In developing e-modules, 4 criteria must be considered [19], namely: 1) content coverage, 2) presentation, 3) readability and 4) graphics. If these 4 criteria are met, the developed e-module is eligible to use.

Based on initial observations of students who have taken the Computer Pattern Making Course, it shows that 45% of students admitted that they had difficulty finding references and reading sources about Richpeace software in libraries, bookstores, and the internet so students only relied on material provided by lecturers. Meanwhile, the students who did not know anything about CAD, especially in the field of fashion, before taking the Computer Pattern Making Course were 56.1%. Student backgrounds also influenced what devices they use. If all material was downloaded, not all students have sufficient memory storage. They had to routinely sort out files that can be deleted so they could download material and took more time to find the files they would want to open. Even when they were going to stream material on YouTube, they had to look for a link first on ELENA.

The results of the documentation for the list of uneven semester grades 2021/2022 showed that each students got a wide range of scores. There are still students who got an E grade of 5.98%. Students with an E grade is known to never submitted assignments and did not take exams even though their presence was more than 50%. According to interviews with the supervising lecturers, one of the aspects that influenced is motivation. The supervising lecturer also stated that the use of appropriate learning media can be a booster for student learning motivation.

It is known that learning in Computer Pattern Making Course in the Fashion Education Study Program at Semarang State University during the pandemic were using Zoom Meeting media, SIKADU UNNES, ELENA and video tutorials made and uploaded by lecturers on their YouTube channel. This is a solution to the implementation of distance learning due to the rampant Covid-19 outbreak. These materials were spreaded to various platforms and caused students to need more time to find material that has been provided by lecturers. In addition, the material used in learning has not been arranged systematically. Supervising lecturers admitted that they need learning media that can combine it all. The

video tutorial also needs to be upgraded to be more complete and more detailed so that students who don't understand enough can re-watch the video until they are able to understand it. Because it will be watched repeatedly, an interesting video is needed so students don't get bored. It is hoped that in its development the media will be more practical, which is easy to use, lightweight and can be learned anywhere and anytime.

According to the faced problems, it can be concluded that the development of e-modules can be the right choice. This is in line with 37% of students who agreed and 52.5% strongly agreed that the Computer Pattern Making Course requires learning media that are complete, easy to understand, durable and easy to receive. Students and lecturers also want interesting learning media, accompanied by pictures and videos. Students and lecturers also wanted an interesting learning media, accompanied by pictures and videos. This desire fits perfectly with the characteristics of the e-module. Students and lecturers agreed that developed e-modules will be equipped with clearer video and audio, which can be watched repeatedly so that they can be studied independently and periodically. Moreover, e-modules about making CAD patterns with Richpeace software are still rare.

In line with previous research conducted by Lusiana [20] concluded that (1) this E-module is independent by not requiring other applications for its operation and is more flexible because it is easy to carry, so that it can be studied anytime and anywhere. (2) The results of the media expert's judgement showed 84% and the material expert's judgement was 90.69% so that it was included in the very eligible category as a learning resource in the learning process. Amini [21] in the International Journal of Technology, Knowledge and Learning stated that if students consider cellphones as valuable tools for learning, then there must be materials and developed media for e-learning learning systems by not only considering the content perspective, but also information design and ease of use.

The existence of e-modules can complement and enrich the learning resource options for Computer Pattern Making Courses. In its development, e-modules are arranged in a concise, systematic, and get to the core of the discussion and are adjusted based on the way students think, so they will not cause boredom when studying them. Research on the development of e-modules is also supported by research from Nufus et al, [17] who also stated that using e-modules increase students' understanding of learning concepts.

According to Suarsana and Mahayukti [22] the advantages of e-modules compared to print modules are that e-modules are interactive which makes it easy to navigate, allows displaying images, audio, video, and animation and can be equipped with formative tests/quizzes that allow automatic feedback. If previous

educators distributed them separately, now all of them can be packaged into one systematic unit in the form of e-modules.

E-module is individual learning; therefore, efforts are needed to involve as many characteristics of students as possible to optimize learning media planning. Learning experiences in e-modules must also be provided to help students to achieve learning objectives as effectively and efficiently as possible, and to enable students to implement active and independent learning. The use of e-modules promotes active learning [16].

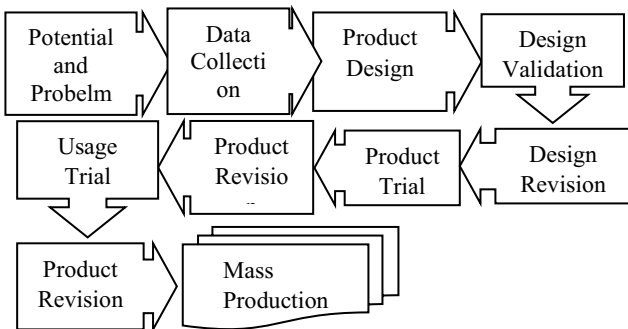
**2. METHOD**

**2.1. Types of Research**

The type of research used is Research and Development (R&D). This research is a research method for developing a new product or improving existing products and can be held accountable. According to Sugiyono [23] R&D is a research method to produce certain products and test their effectiveness. The product being developed is an electronic module (e-module) learning media designed through the Canva platform for learning CAD fashion patterns using Richpeace software in the Computer Pattern Making course. E-module media can present learning materials in the form of text, images, audio, links, and videos that make it easier for students to access material flexibly.

Sugiyono [23] classified the development model in the form of: 1) Procedural model, a descriptive model indicating the stages that must be followed to produce a product. 2) The conceptual model, an analytical model that mentions product components, analyzes the components to be developed. 3) The theoretical media describes a framework of thinking based on relevant theories and supported by empirical data. In this research used a procedural model based on the development goals to be achieved, namely, to produce products in the form of e-modules and will be tested on material experts and media experts.

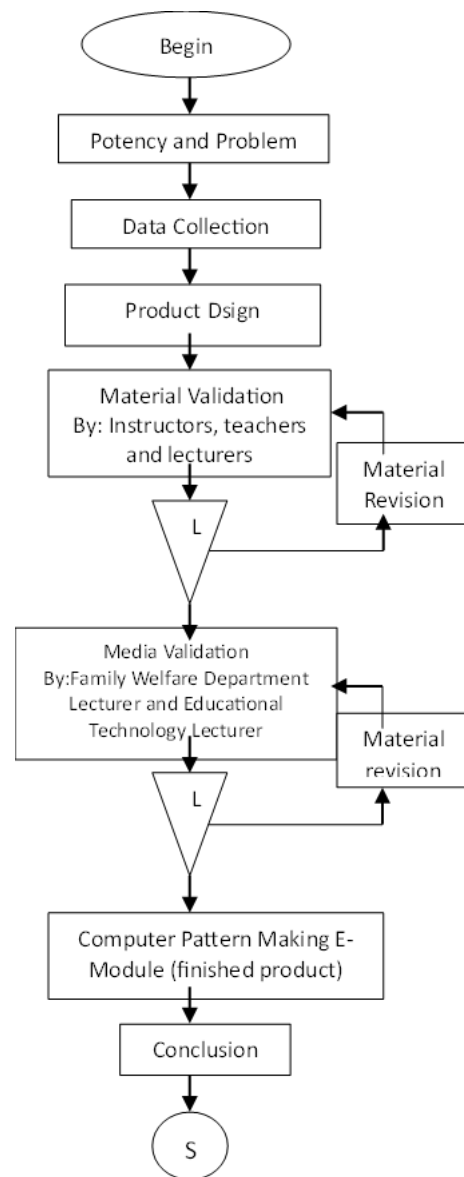
The stages used refer to the research and development method according to Borg and Gall modified by Sugiyono [23] as follows:



**Figure 1** Research and development method stages.

Procedurally, the stages according to Sugiyono above are not the standard stages that must be followed but can be adjusted based on the research needs. Research and development of this e-module will only use five out of ten stages, until the design revision. This is because the research nly reached the eligibility test stage of the CAD Fashion pattern e-module, where the test is limited to material and media testing by validators or expert judgment. The five research stages to be carried out are potencys and problems, data collection, product design, design validation, and design revision.

The E-Module development procedure is then modified as needed. The intended development procedure can be seen in the following chart:



**Figure 2** E-Module development flowchart.

### *2.1.1. Potency and problem*

This research went from the potency or problem. Everything that is utilized, will add a value, that makes potency [23]. Problems can be used as potency when utilizing them. Problems are deviations between what is expected and what actually happened [23].

The problem with the Computer Pattern Making course at Semarang State University is the difficulty to get references and other learning resources about CAD outside of the learning media provided by the lecturer. Apart from that, media is also needed that can enhance independent learning for students, especially after the Covid-19 pandemic which affected the learning system which fluctuated between face-to-face learning and distance learning. Based on that problem, the development of the CAD fashion pattern e-module was chosen.

E-modules have the potency to support learning by increasing students' interest in learning, helping students to learn independently, and adding learning resources. This is in line with the problem in the Computer Making Pattern Course. Technological developments have also made the e-module development process become easier, more interesting, and systematic using Canva.

### *2.1.2. Data Collection*

After identifying the potency and problems factually and up to date, the next step that must be taken is to collect various information that can be used as material for product planning which is expected to overcome these problems [23].

Data collection methods used in this study are observation and documentation. Documentation in the form of Semester Learning Plans (RPS) and teaching materials are used in the Computer Pattern Making Course in lectures before the e-module development research is done. Meanwhile, the observation sheets are used to collect information during the initial study observation, on the material test, and media test conducted by the validator.

### *2.1.3. Product design*

Product design must be embodied in an image or chart that can be used as a guide for assessing and making products [23]. The eligibility of the CAD fashion pattern e-module will be known after passing the tests by validators who are experts in their fields.

### *2.1.4. Desain Validation*

Design validation is an activity process to judge whether product design, in this case a new teaching method rationally will be more effective than the old ones or not. Validation is a judgement based on rational thinking before facts on the ground [23].

### *2.1.5. Design Revision*

Product designs that have been validated by the validator will discover their weaknesses. These weaknesses are then reduced by improving the design or revision. The researchers themselves will do these improvements because they are the ones who produce the products [23].

## **2.2. Research Variable**

Research variables are anything that can take any form determined by the researcher to be studied so that actual information is obtained, then conclusions are made [23]. Variables are various symptoms that become objects in research [24]. The variables in this study are narrow or single variables. The single variable is the eligibility of the CAD Fashion Pattern e-module, this variable does not affect or is influenced by other variables.

## **2.3. Data Collection Techniques**

According to Suwartono [25] data collection can be done by observation, interviews, questionnaires, tests and archives or documentation. This study used two of the five data collection techniques, namely observation and documentation.

### *2.3.1. Observation*

Observation is a data collection technique by using the eyes and ears as windows to record data so that this method is suitable for studying processes and behavior [25]. Observations were made to find out directly the learning conditions which included the learning process, media, facilities, infrastructure, and others. There is also an observation sheet that is used at the product validation stage which is signed by media experts and material experts to test the eligibility of the e-modules that have been made. The questionnaire scores used a Likert scale with 4 assessment categories, namely: strongly agree (score 4), agree (score 3), disagree (score 2), and strongly disagree (score 1).

### *2.3.2. Documentation*

Documentation data collection techniques are looking for data about things or variables in the form of notes, transcripts, books, newspapers, magazines, inscriptions, agendas and so on [24]. Documentation is really needed to obtain information about CAD fashion pattern making, Richpeace software, competency points to be achieved in learning and others which can be used as a reference for developing e-modules.

## 2.4. Research and Development Subject

Subjects in this research are:

### 2.4.1. Material Experts

In this study, 3 material experts will provide an assessment in terms of the eligibility of the contents in CAD fashion pattern e-module as well as other aspects through instruments that have been made by researchers. Material experts will also provide some input for improving the CAD fashion pattern e-module to reduce the weaknesses of this e-module. Experts in this subject are garment vocational instructors at BBPVP Semarang, fashion teachers at Ibu Kartini Vocational High School Semarang, and lecturers in fashion education study programs at Semarang State University. The three material experts are experts in the field they are involved in and are also selected according to the aspects in the research.

### 2.4.2. Media Experts

In this research, 3 media experts will provide an assessment in terms of the eligibility in CAD fashion pattern e-module media as well as other aspects through instruments that have been made by researchers. Media experts will also provide some input for improving the CAD fashion pattern e-module to reduce the weaknesses of this e-module. These media experts are 1 lecturer majoring in Educational Technology and 2 lecturers majoring in Family Welfare Education at Semarang State University. The three media experts are experts in the field they are involved in and are also selected according to the aspects in the research.

## 2.5. Data Collection Instrument

The instrument is used to determine the quality of the developed e-module. The instrument is a tool used to measure observed natural and social phenomena (Sugiyono, 2017). The instrument is used to determine the quality of the developed e-module. The instrument is a tool used to measure observed natural and social phenomena [23]. According to Suharsimi Arikunto [24] research instruments are tools or facilities used by researchers to collect data to make work easier and get better results, in the sense that it is more accurate, complete and systematic so that the data is easy to be processed.

In this research, an expert eligibility test instrument sheet was used for the developed e-module learning media. The purpose of doing an expert eligibility test is to find out whether the developed e-module CAD fashion pattern as a learning media has or has not met the eligibility criteria and to get suggestions for further improvement. The eligibility test was done by media experts and material experts.

## 2.6. Instrument Validity

According to Suharsini Arikunto [24] a measure that shows the validity or level of validity of an instrument is validity. An instrument is said to be valid if it can be used to measure what will be measured [23]. How far the data collected does not deviate from the intended validity pictured, it also can be seen from the high or low level of instrument validity. Instruments that are less valid will have low validity. While valid or valid instruments will have high validity.

Testing the validity can be assisted by using an instrument grid because it was included in this study's content validation testing. The technique used to find validity refers to the Aiken's V formula which is formulated as follows:

$$V = \frac{\sum S}{n(c-1)}$$

Notes:

- V = Validity
- s = r - lo
- lo = Lowest research score (in this research 1)
- c = highest research score (in this research 4)
- r = score given by the judge
- n = validators in total

**Table 1.** Interpretation of the Validity Test.

VALIDITY COEFFICIENT	INTERPRETATION
>0.8	Very valid
0.4-0.8	Valid
<0.4	Less valid

## 2.7. Instrument Reliability

An instrument which used several times to measure the same object, produces the same data is called a reliable instrument [23]. Reliability is seen from the extent to which the results of a measurement process can be trusted (Azwar, 2013). In this study, Cronbach's Alfa reliability was used because this technique was carried out for interval/essay data types. The Alfa Cronbach reliability testing technique is formulated as follows [26]:

$$r_i = \frac{k}{(k-1)} \left\{ 1 - \frac{\sum s_i^2}{s_t^2} \right\}$$

Notes:

- $r_i$  = instrument reliability
- k = the number of questions
- $\sum s_i^2$  = number of variant items
- $s_t^2$  = total variant

Variant formula :

$$s_i^2 = \frac{JK_i}{n} - \frac{JK_s}{n^2}$$

$$St^2 = \frac{\sum X_t^2}{n} - \frac{(\sum X_t)^2}{n^2}$$

Notes:

$JK_i$  = The sum of all item scores squares

$JK_s$  = The sum of the subjects squares

The classification results obtained from instrument reliability testing are considered reliable if the alpha value is reliable > 0.60. The instrument is considered unreliable if the alpha value is <0.60.

## 2.8. Data Analysis Technique

The data analysis technique uses quantitative data analysis in the form of instrument scores from a questionnaire using the Linkert scale. The questionnaire score is a judgement of material experts and media experts. The data obtained from the expert judgement sheet is used to measure the eligibility level of the product being developed. The product eligibility test is done to find out if the product is eligible in terms of material and media or if there is still something that needs to be improved. The level of product eligibility is measured using analytical techniques according to [26] as follows:

$$P = \frac{\sum n}{\sum N} \times 100\%$$

Notes:

P : Percentage of e-module eligibility

$\sum n$  : Total value aspect scores by experts

$\sum N$  : Total maximum score of the assessment (maximum value of each item x total respondents)

The percentages that have been obtained are then converted into qualitative sentences. The suitability of the aspects in the CAD fashion pattern e-module development is guided by the following table:

**Table 2.** Eligible Test Interpretation.

Assesment Percentage	Interpretation
76%-100%	Very Eligible
51%-75%	Eligible
26%-50%	Less Eligible
0%-25%	Not Eligible

## 3. RESULTS AND DISCUSSION

### 3.1 Research Result

#### 3.1.1. Result of E-module development

Research and development that has been done by researchers produced E-Modules for CAD Fashion Patterns Using Richpeace Software in Computer Pattern Making Courses. This e-module contains information

and guidance for students in learning to make fashion patterns digitally independently with or without a companion. The contents of the developed e-module started with an introduction to CAD, how to install Richpeace software, introduction to the tools, making basic patterns, breaking patterns, grading and markers.

The research was conducted using Research and Development (R&D) research methods. This used the procedures and stages of research and development methods according to [23] which have been adjusted into five stages, because this research is limited to product validation by experts. The five stages are described including potencys and problems, data collection, product design, product validation tests by material experts and media experts and revision. These following are the e-module development procedures that have been done:

#### 3.1.1.1. Potencys and problems

This stage is carried out as an initial requirement for research and development to find out the existing problems and then adjust them to the potency that can be used as a solution in solving these problems. At this stage, interviews were conducted with lecturers in the Computer Pattern Making Course, documentation of student grades and initial observations by distributing observation sheets of media needs in the Computer Pattern Making course to students of the Fashion Education Study Program class of 2017, 2018 and 2019 at the Semarang State University.

Based on the problem description, the development of e-module learning media was chosen which can include various media such as text, images, videos, links and so on. The size of the e-module is relatively light, easy to access and easy to disseminate. Besides that, there are no viruses and advertisements that can interfere with the e-module's work. This made the researchers develop a CAD Fashion Pattern E-module using Richpeace Software.

#### 3.1.1.2. Data Collection

Data collection was carried out as researcher's material in developing e-modules. The data that has been collected is:

- RPS (Semester Lecture Plan) for the Computer Pattern Making Course, Semarang State University. This RPS is used as a reference for the E-Module contents so that it is in accordance with the learning outcomes that wished to be achieved.
- Materials include an introduction to CAD, how to install Richpeace software, introduction to the tools used, making basic patterns, breaking patterns, grading and markers.
- CAD tutorial videos on the Roudlotul Sholikhah Youtube channel.

- d. The results of assignments and scores of fashion education students who have taken the Computer Pattern Making Course are then analyzed to find out what aspects that can be a weakness in CAD pattern making using Richpeace software.
- e. Collection of images to clarify the material contents. These images of the Richpeace RP-DGS and RP-GMS software, icons on the Richpeace tools, as well as supporting images explaining the concept of clothing grading.
- f. A link to download the Richpeace software is available on the Richpeace website.
- g. CAD fashion pattern material uses Richpeace software according to Roudlotus Sholikhah and Yashinta Ramadhani [26].

### 3.1.1.3. Product Design

The process of developing the CAD Fashion pattern E-Module Using Richpeace Software went through several stages which was named by the researchers are namely the preparation stage, the drafting stage, the developing stage and the finishing stage.

#### 3.1.1.4. Preparation Stage

At this stage the researcher prepared all the components that will be used in making the e-module. These components are:

- a) Prepare sourced materials from files provided by the supervising lecturers and books about CAD, especially making fashion patterns using Richpeace software. These materials are then designed in the form of a storyboard which contains an overview of the e-module which in accordance to the RPS.
- b) Designing clothing illustrations for pattern breaking material and evaluation questions made are using CorelDraw software accompanied by production design I and production design II. Clothing designs made in the form of button-down skirts, bell-sleeved dresses, and women's shirts.
- c) Creation of CAD tutorial videos. The researcher made 8 videos consisting of 2 introduction videos and how to use the tools used in Richpeace software and 6 video tutorials, namely making basic skirt patterns, basic body patterns, basic sleeve patterns, broken skirt patterns, broken dress patterns, grading and markers and broken women's shirt pattern.

Making video tutorials consists of several processes. The process carried out by researchers is :

1. Starting from screen recording of the presentation of material using the Richpeace software. The application used to record the screen is Zoom Meeting.
2. Voice over or dubbing is done using the recorder available on the researcher's cell phone. Then change the sound recording format from M4A to MP3 using the M4A Converter application.

3. Make opening and closing videos using Canva.
4. Editing screen recording videos, adding opening and closing videos and inserting sound so that they become complete and interesting video tutorials. Video editing using the CapCut application.
5. Uploading the finished video tutorial to the Yashinta Ramadhani Youtube channel. Video tutorials can be watched at the following link:
  - a. *Tools Software Richpeace Part I* : <https://youtu.be/IxAMxEls2Yw>
  - b. *Tools Software Richpeace Part II* : <https://youtu.be/gxVIJfsR-7E>
  - c. Tutorial on Making a Basic Skirt Pattern Using Richpeace Software : <https://youtu.be/IYiWApVDG6U>
  - d. Tutorial on making a Basic Body and Arm Pattern Using Richpeace Software : <https://youtu.be/julw0enZ1A8>
  - e. Tutorial on Breaking Skirt Patterns Using Richpeace Software : [https://youtu.be/B\\_ZOzE-Faak](https://youtu.be/B_ZOzE-Faak)
  - f. Tutorial on Breaking Dress Pattern Using Richpeace Software : [https://youtu.be/6qHD8pfMT\\_4](https://youtu.be/6qHD8pfMT_4)
  - g. Tutorial on Grading dan Marker Using Richpeace Software : <https://youtu.be/GeEfl1JC-1o>
  - h. Tutorial on Breaking a Shirt Pattern Using Richpeace Software : <https://youtu.be/Hnb14Rq6RNM>

#### 3.1.1.5. Drafting Stage

At this stage the researcher compiled all the components that had been arranged at the arrangement stage in the Microsoft Word Software. The arrangement of the components is sorted according to the learning outcomes in the RPS for Computer Pattern Making Course. The results of this stage are then tested for eligibility by material experts before being converted into e-module media.

#### 3.1.1.6. Developing Stage

At this stage, the researcher developed the drafting results that have been tested on material experts in the form of an e-module. E-module development is carried out using the Canva platform by taking advantage of its various features. Researchers were able to combine text, images, videos, tables, and links into one media. Don't forget to add the QR code feature so that if the e-module is made into a print version, users can still access videos connected to the Yashinta Ramadhani Youtube channel by scanning the QR code using a cellphone. The intended users in this study are students and supervising lecturers. The e-module is equipped with a hyperlink by adding icons which, when it is clicked, can go to the desired page more quickly. In designing e-modules, researchers used bright colors such as purple, pink, yellow, and orange to



attract users' attention. The white background used in the e-module was chosen so that users are comfortable when reading the text in it.

3.1.1.7. Finishing Stage

At this stage the researcher conducted a review such as checking whether the link and QR code are functioning as they should, checking writing to avoid typos, suitability of layout, text, images and videos, consistency of color composition, and the use of fonts and font sizes.

The product of the development is the E-Module in PDF format which can be accessed via mobile phones or laptops. After it went through various development and improvement processes, the following is the result of the E-module for Making a CAD Fashion pattern Using Richpeace Software:

(1) Front Cover

The cover section contained the title of the e-module, an image of a CAD fashion pattern, the author's name, the Semarang State University logo, and information on the advantages of the e-module. The front cover is designed to be attractive, simple, and contains an overview of e-module contents.



Figure 3 E-Modul Cover Display.

(2) Table of Contents

The table of contents section is like the menu in the e-module and its pages. Meanwhile, the material list section contains the subject matter of the e-module which has been adapted to the RPS in the Computer Making Pattern Course at Semarang State University. To make it easier to use the e-module, each page in the table of contents and list of materials can be clicked so that users can immediately go to the page they want.



Figure 4 Table of content display.

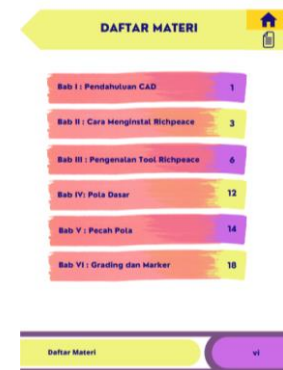


Figure 5 Material list display.

(3) Instructions for Using the E-module.

This section is used as a guide in using the e-module so that the e-module can be used properly and the material can be understood optimally. Contents in the instructions for use such as the requirements for learning the e-module, icon functions, how to learn the e-module and the e-module function.



Figure 6 Instructions for use display.

(4) E-Modul content

It contains material and information about making CAD fashion patterns using Richpeace software. This section includes a link to download the Richpeace software as well as a video linked to the

Yashinta Ramadhani Youtube channel and a QR code that can be scanned using a smartphone camera.

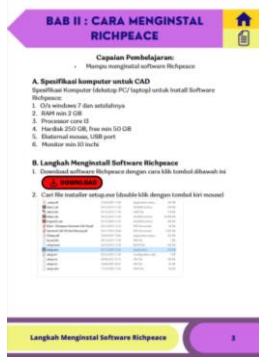


Figure 7 Install richpeace software display.



Figure 8 Video display.

(5) Evaluation and Answer Key  
The evaluation consists of multiple-choice questions, descriptions, and practice questions given to test the understanding of the material about making CAD patterns using Richpeace software. The evaluation is equipped with an answer key to match the answers.

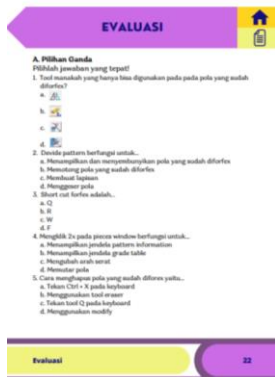


Figure 9 Evaluation display.



Figure 9 Answer key display.

### 3.1.2. Validity and Reliability of Instrument

Instruments arrangement in the form of observation sheets for judgement from material experts and media experts. The validity of the use of the instrument must be known through instrument testing. Instrument testing in this study was carried out by three instrument validators who were lecturers at the Family Welfare Department, Semarang State University. The validators are Sita Nurmasitah, S.S., M. Hum, (Instrument Validator 1), Taofan Ali Achmadi, S.Pd., M.Pd., (Instrument Validator 2) and Delta Apriyani S.pd., M.Pd., (Instrument Validator 3).

#### 3.1.2.1. Validity test

The validity test is to determine whether a questionnaire or observation sheet is valid for each item by correlating the scores obtained on each question or statement with the individual's total score. Validity testing was done using Microsoft Excel software.

Based on the validity test it was concluded that each statement item has a valid status because the results are > 0.40 so that it can be interpreted that the instrument is suitable for use in research.

#### 3.1.2.2. Reliability Test

Reliability Test is used to get instruments that are truly trustworthy and reliable. The reliability coefficient of the instrument is to determine the consistency of the answers to the questions given by the validator. The reliability test in this study used the Alpha Cronbach formula which was calculated with the help of a computer using Microsoft Excel software. The results of the research variable reliability test are as follows.

**Table 3.** Reliability Test.

Aspects	Rater			Variants of Question Items
	1	2	3	
1	4	4	3	0,33333
2	4	4	3	0,33333
3	3	4	4	0,33333
4	3	4	3	0,33333
5	4	4	3	0,33333
6	4	4	4	0
7	3	3	3	0
<b>Total Score</b>	25	27	23	
<b>Total variant</b>	4			
<b>The number of variants item</b>				1,66667

(Source: Research Data)

The results of the data processed in the table above are then entered into the following Alpha Cronbach formula:

$$r_i = \frac{k}{(k-1)} \left\{ 1 - \frac{\sum s_i^2}{s_t^2} \right\}$$

$$r_i = \frac{7}{(7-1)} \left\{ 1 - \frac{1,66667}{4} \right\}$$

$$r_i = 0,6805$$

Based on the results of the reliability test calculation where  $0,6805 > 0,60$  it can be concluded that the variables studied are "reliable" so that they can be used in research.

### 3.1.2.3. Product Eligibility Validation

Eligibility validation is carried out by conducting e-module development product eligibility tests conducted by Expert Judgments in the form of material experts and media experts. This eligibility test aimed to determine the eligibility of the E-Module for CAD Fashion patterns Using Richpeace Software by filling out the observation sheet for the development of the e-module provided by the researcher.

The material eligibility test was done by three material experts namely Lailatul Hikmah, S.Pd., who works as the first expert garment instructor at the Center for Vocational and Productivity Training (BBPVP) Semarang City (Material Expert 1), Muhdhor, S.Pd., who works as a fashion teacher at Ibu Kartini Vocational High School Semarang and is also the author of a book entitled Pattern, Grading and Marker with CAD (Richpeace) published by the Directorate of Vocational Development – Ministry of Education and Culture (Material Expert 2), Dra. Widowati, M.Pd., who works as a Family Welfare Department lecturer at Semarang State University (Material Expert 3).

Based on the eligibility test of the material, the researcher obtained suggestions, namely: 1) Each design/sketch has to be completed with production design I and production design II. 2) The selection of evaluation questions has to be adjusted to competency achievements. 3) Correct spelling, grammar and mistyped.

Media eligibility tests were signed by three media experts, namely Diska Rahmita Gasti, S.Sn., M.Ds., who works as a Family Welfare Department lecturer at Semarang State University (Media Expert 1), Godham Eko Saputro, S.Sn., M.Ds., who works as a Family Welfare Department Lecturer at Semarang State University (Media Expert 2), and Edi Subkhan, S.Pd., M.Pd., who works as an Educational Technology lecturer at Semarang State University (Media Expert 3).

Based on the eligibility test of the media, researchers received suggestions, namely: 1) Software installation links should not be directed to pirated software. Point to genuine software or persuasively to free trial. 2) The font can be changed to a more recent one. 3) Layout can be maximized again. 4) It is better to provide a video in the Introduction to Richpeace Tools chapter.

### *3.1.3. Revision*

The revision process is carried out after the product has been validated by material experts and media experts according to suggestions and input for improving the e-module to make it more perfect. Improvements made to the CAD Fashion Pattern E-Module Using Richpeace Software based on suggestions from material experts and media experts as follows:

#### 3.1.3.1. Eligibility Test Results for E-Module Development in the Computer Pattern Making Course

Observation sheets that have been tested as valid and reliable are then given to material experts and media experts along with the products to be tested. The product is an E-module entitled CAD Fashion Pattern Using Richpeace Software. This is done to determine the level of product eligibility and obtain suggestions for improvement for the perfection of the e-module. The product eligibility test results validated by material experts and media experts are as follows :

#### a. Material Expert

The aspects of the assessment by material experts are in the form of content eligibility, language, presentation and instructional quality of the e-module. Preparation of material based on learning outcomes in RPS (Semester Lecture Plan) Computer Making Pattern Course at Semarang State University. The eligibility assessment of the e-module is in the form of quantitative data obtained from each question item from the observation sheet filled in by the material expert along with comments and

suggestions for improvement. Data from the eligibility assessment of e-module materials by material experts can be seen in table 4 below.

**Table 4.** Data from material expert assessment results.

Aspects	Indicator	Validator		
		1	2	3
Content eligibility	Suitability of e-module material with learning outcomes	4	4	4
	Appropriateness of chapter titles and sub-chapters with content	4	4	4
	The truth of the substance of the material can be accounted for	3	4	4
language	Using commonly used terms, communicative language, simple and easy to understand	4	4	4
	Concept maps provide clear information	4	4	4
	Writing material in accordance with the rules of the Indonesian language	3	4	3
Presentation	Instructions for use are clearly listed	4	4	4
	The material in the video is clear and easy to understand	4	4	4
	The order of presentation of the material is packaged specifically	4	3	4
	There is feedback in the form of evaluation	4	4	4
	Evaluation helps measure mastery of the material	4	4	4
	Information about making CAD fashion patterns is presented in full in the materials that will be developed into e-modules		4	4
Instructional Quality	CAD fashion pattern material can be used for self-study	3	4	4

Aspects	Indicator	Validator		
		1	2	3
	CAD fashion pattern material can help educators to smooth learning	4	4	4
<b>Total score</b>		53	55	55
<b>Sum score</b>		<b>163</b>		
<b>Sum maximum score</b>		<b>168</b>		
<b>Eligibility percentage</b>		<b>97,02%</b>		
<b>Criteria</b>		<b>Very Eligible</b>		

The table above shows the results of the material expert's assessment of the eligibility of the E-Module for CAD Dress Patterns Using Richpeace Software that has been developed by researchers. The calculation of the material expert validation assessment uses the product eligibility percentage formula according to Sugiyono (2016) then the calculation results are interpreted into a product eligibility percentage scale table. The material expert's assessment showed a result of 97.02% so that it was said to be "Very eligible."

b. Media expert

The aspects of the assessment by media experts are in the form of Technical Quality, Graphics and Instructional Quality of the e-module. The e-module media is made using the Canva application, while the video contained in the e-module is recorded using a Zoom meeting, edited using the Capcut application and uploaded on the Yashinta Ramadhani Youtube channel. The eligibility assessment of the e-module is in the form of quantitative data obtained from each question item from a questionnaire filled out by media experts with comments and suggestions for improvement. Data from the e-module media eligibility assessment results by material experts can be seen in table 5 below.

**Table 5.** Data from media expert assessment results.

Aspects	Indicators	Validator		
		1	2	3
Technical Quality	The E-module is easy to operate	4	4	4
	The instruction page makes it easier to operate the e-module	4	4	4
	The systematic presentation of the e-module makes it easy and not confusing	4	3	4
	E-modules are easy to share and distribute	4	4	4
	E-module is efficient to use as a learning source	3	4	4
	The QR code/link in the	4	4	4

Aspects	Indicators	Validator		
		1	2	3
	e-module makes learning easier and functions properly			
graphics	The appearance of the e-module cover looks attractive	3	3	4
	Selection of attractive e-module layout designs	3	3	4
	The selection of the type and size of the letters used in the e-module is correct	3	3	3
	The color composition used in the e-module is appropriate	3	4	4
	The image presented in the e-module is clear	4	4	3
	The videos presented in the e-module are clear	4	4	4
	The placement of navigation buttons in e-modules is consistent	4	4	4
	The spacing between words, sentences or paragraphs in the e-module is appropriate	3	4	3
Instructional Quality	E-modules can be used for independent study	4	4	4
	E-modules can be used by educators to help smooth learning	4	4	4
	E-modules are developed in accordance with the times.	4	4	4
<b>Total Score</b>		62	64	65
<b>Sum Score</b>		<b>191</b>		
<b>Sum Maximum Score</b>		<b>204</b>		
<b>Eligibility Percentage</b>		<b>93,63%</b>		
<b>Criteria</b>		<b>Very Eligible</b>		

Table 5 shows the results of the media expert's assessment of the eligibility of the E-Module for CAD fashion patterns Using Richpeace Software that has been

developed by researchers. The media expert validation assessment calculation used the product eligibility percentage formula according to Sugiyono (2016) then the results of the calculation are interpreted into a product eligibility percentage scale table. The material expert's assessment showed a result of 93.63% so that it was said to be "Very Eligible".

Based on the results of the assessment of material experts and media experts, it can be concluded that product development in the form of CAD Fashion pattern e-modules Using Richpeace Software in Computer Pattern Making Courses is very eligible to use as an alternative to independent learning media.

### 3.2 Discussion

#### 3.2.1 Procedure for Developing E-Modules in Computer Pattern Making Courses

The development of the E-module is carried out to realize alternative learning media that can be studied independently in the Computer Pattern Making Course. This study uses 5 development stages from Sugiyono (2013) in the form of :

- 1) Potencys and problems, problems obtained from the results of initial student observations, interviews with supervising lecturers and documentation of student grades led researchers to develop products in the form of e-modules. The e-module has a lot of potency to overcome the problems that exist in the Computer Pattern Making Course, and it is still rare to find e-modules about Richpeace software.
- 2) Data collection collected various data to support the development of e-modules in the Computer Pattern Making Course.
- 3) Product design, carrying out various stages in product design in the form of preparation stage, drafting stage, developing stage and finishing stage.
- 4) Validation, testing the eligibility of the e-module to expert judgment in the form of material experts and media experts.
- 5) Revision made improvements according to the suggestions given by expert judgment in order to make the e-module better.

The material contained in the e-module consists of six learning outcomes, namely: CAD introduction, introduction to Richpeace software tools, making basic skirt, body and sleeve patterns, breaking patterns, grading and markers. Learning outcomes have been adjusted to the RPS (Semester Lecture Plan) in the Computer Pattern Making Course at Semarang State University. The preparation of material in the form of text, images, videos, and links is packaged with layout guidelines that have been designed in advance on storyboards to be implemented during the development process. The e-module is presented in PDF format which makes the file size light even though it consists of various types of

media. The integration of several media such as text, images, videos and links arranged with an interesting concept is expected to increase motivation and interest in learning and better understand the making of CAD fashion patterns using Richpeace software. The e-module contains eight videos connected to Yashinta Ramadhani's Youtube channel. Even so, the size of the E-module is only 3.86MB, so it's easy to open on cellphones and laptops. This lightweight size also makes the E-module easy to deploy [27].

The end result of the e-module fulfills the characteristics according to Mutma'inah [28] namely self-instruction, self-contained, stand-alone, adaptive, and user-friendly. Educational materials developed for e-learning mode consider content perspectives, material composition and ease of use [29]. The development of e-modules is in accordance with research [30] where all material is collected in one container so that it makes it easy to find it. The convenience of this e-module is supported by the hyperlink feature so that material can be quickly accessed and an alternative is in the form of a QR code. The in-depth material for making CAD fashion patterns is arranged in stages from introduction to material development.

The advantages of the CAD Fashion Pattern E-Module Using Richpeace Software are: 1) The E-module can be used as an alternative learning media in Computer Pattern Making Courses because it displays material equipped with audio and visual media. 2) E-modules can be studied independently anywhere and anytime with or without a companion and are easily accessed using a device. 3) It doesn't cost more to reproduce. 4) It doesn't take much effort to carry it because it's in PDF file form. 5) The e-module provides tutorial videos and links to download Richpeace software. The video in the e-module contains tutorials for making CAD fashion patterns using Richpeace software from basic patterns, breaking patterns, grading and markers and how to use each tool. The use of video tutorials is in line with the results of Steils' research [31], which recommends developing video tutorials for core and additional learning. Meanwhile, the lack of e-modules is in the color of the e-module layout which looks different depending on the type of device used. In addition, the effectiveness of e-modules in learning is not yet known because in this study it was limited to due diligence by expert judgment, namely material experts and media experts.

#### 4.2.2 The Eligibility of E-Modules Development in Computer Pattern Making Courses

The development research that produced the final product in the form of an e-module has been tested for eligibility by an expert judgment consisting of three material experts and three media experts. The statement instrument on the observation sheet filled in by the expert judgment is also valid and reliable. The results showed that this e-module was very suitable for use in learning in

the Computer Pattern Making Course which obtained a score of 97.02% from material experts and 93.63% from media experts. This shows that e-modules are eligible and can be used as learning resources or alternative learning media. Product development is made in an attractive, systematic, concise, and complete form to attract interest in learning CAD fashion pattern making with Richpeace software. This e-module can be studied independently, able to understand the material with or without a companion. This development aims to make it easier to review material and catch up on material that is left behind because it can be accessed anywhere and anytime through their respective devices [32].

These results are in accordance with research conducted by Resi Herdiningrum [33] entitled "Development of Design Basic Electronic Modules as Independent Learning Assistance for Class X Widya Praja Vocational High School Ungaran" which stated that the material expert eligibility test obtained a percentage of 90.69% which is included in the very eligible category and the percentage of media experts is 84% which is also in the very eligible category.

Likewise, research from Patino [34] entitled "Development of Basic Chemistry Practicum E-Modules Using the Canva Design Application" also stated that e-modules can be used for online and offline learning. Susi Agustini [35] stated that Canva's QR code learning media was very effective and efficient in the learning process and there was an increase in learning outcomes. The results of this study are in accordance with research conducted by Handayani et al [36] entitled "Development of Guided Discovery Based Electronic Module for Chemical Lessons in Redox Reaction Materials" which stated that the material expert's due diligence test obtained 91.425% so that it was declared very valid. The resulting e-module can be accessed via a cellphone or laptop. With this e-module, students can access learning materials from anywhere without time limitation.

From the discussion above, the research entitled "Development of CAD Fashion Pattern E-Modules Using Richpeace Software in Computer Pattern Making Course" has tested its eligibility to be used as a learning for making CAD fashion patterns using Richpeace software independently.

## 4. CONCLUSION

Based on the research that has been done in the development of e-modules, it can be concluded that:

1. The development procedure CAD E-Module Fashion patterns Using Richpeace Software in the Computer Pattern Making Course is an R&D research, compiled based on five development stages, namely: 1) potency and problems by observing and analyzing needs, 2) collecting data using the observation method and documentation, 3)

product design including script preparation, video creation and product manufacturing design, 4) product validity testing by material experts and media experts, 5) product revision.

- The development results of the CAD E-Module Fashion patterns Using Richpeace Software received an average score of 97.02% which was included in the very eligible category from three material experts and an average score of 93.63% which was included in the very eligible category from three expert's media. This shows that the e-module is very eligible to be tested for use as an alternative learning media in Computer Pattern Making Courses.

## 5. RECOMMENDATIONS

Based on the results of the study entitled Development of CAD Fashion Pattern E-Modules Using Richpeace Software in Computer Pattern Making Course, the suggestions given by the researcher are as follows:

- Students can use this e-module as a guide for independent learning to make CAD fashion patterns using Richpeace software because e-module is prepared according to student needs based on the RPS of Computer Pattern Making Course at Semarang State University.
- Educators can use this e-module as an alternative learning media in Computer Pattern Making Courses because it has been tested very eligible according to material experts and media experts.
- For future researchers who will develop e-modules like which was developed by researchers, it is hoped that they can complete the e-module material by providing a case study of calculating marker ratios based on buyer requests and their application using Richpeace software. Otherwise, the format of the e-module needs to be developed in accordance to technological developments in the future.
- CAD Fashion pattern E-Module Using Richpeace Software is necessary to carry out further research to test the effectiveness of the e-module when it has been used in learning of Computer Pattern Making Course.

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