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Optimizing CAD Pattern Making Learning Through the Development of Video Learning Media in the Family Welfare Education Study Program

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ABSTRACT - The use of Computer-Aided Design (CAD) software in fashion pattern making, particularly CAD Pattern Making, provides opportunities for students to develop their digital design skills. However, not all students are able to understand the pattern making process, such as camisole patterns using the CAD Pattern Making application. Most students experience difficulties in applying theory to practice and feel less confident due to limited references on the use of these tools and software. This study aims to develop video learning media as a medium in CAD Pattern Making courses to minimize the difficulties students face in understanding the concepts and practices of pattern making. This study uses a qualitative approach with 30 third-semester students from the Family Welfare Education Study Program as research subjects. Data collection techniques included interviews, observations, direct observation, and activity documentation. The learning videos developed covered several key elements, including: learning objectives, introduction to the features or tools used, steps for making patterns, and practical tips for making digital camisole patterns. The results of the study indicate that instructional videos can optimize the practical learning process. Students find it easier to understand the use of software features, such as point determination, measurement, line joining, and pattern simulation. These findings indicate that visual media are more effective than lectures or printed teaching materials in explaining the technical concepts of CAD Pattern Making.

Keywords: CAD pattern making, educational technology, pattern making education video, learning media.

INTRODUCTION

The development of digital technology has brought significant changes in the field of education, including in CAD Pattern Making learning through Computer-Aided Design (CAD) software. The use of CAD Pattern Making allows students to create clothing patterns efficiently and precisely compared to manual methods. Fashion brands are competing intensely to attract consumer attention and purchasing power, pushing companies to produce rapidly and in large quantities (Umanah et al., 2024). However, the implementation of CAD Pattern Making learning faces a number of obstacles, especially in terms of students' practical understanding of the use of complex software features. The main gap in this learning process is the lack of adequate and integrated learning resources, especially learning media that can accommodate visual learning styles and hands-on practice. The learning materials that have been dominant so far, in the form of lectures and printed materials, have not been able to optimally bridge theory and practice, causing students to lack confidence in operating CAD software independently.

One of the lecture materials in the department taught by the researcher is CAD Pattern Making, which can be used to design clothing patterns, in this case camisoles. Computer-Aided Design (CAD) is a design system that uses computer equipment and specific design software, allowing users to plan, model, and evaluate a product/item accurately before it is produced (Kulsum, 2020). CAD Pattern Making is defined as the use of vector-based 2D CAD

software to create, import, and modify clothing patterns, which includes drafting, digitization, and pattern making rules such as dart manipulation, fullness addition, and pattern grading (Gill et al., 2024).

CAD Pattern Making is the use of CAD (Computer-Aided Design) software to digitally design clothing patterns, in this case using computer programs to design, develop, and modify basic clothing patterns, as well as make size adjustments and (pattern arrangement on clothing materials, and not all students can understand how to make these camisole patterns even when using CAD Pattern Making. By using CAD, designers can not only visualize patterns but also automate the identification and creation of new patterns based on visual references or the latest styles (Wang & Lin, 2024).

The researcher's observations also showed that most students felt less confident when trying to apply the theories they had been taught. According to some students, they did not have concrete references to see how the techniques for applying tools in CAD Pattern Making were implemented in practice. Based on the complaints of some students, the researcher thought that visual learning media in the form of videos was very necessary for the CAD Pattern Making course. Based on observations of students, it was found that jobsheets and handouts were not effective in CAD Pattern Making learning. This finding is in line with research (Pendidikan & Dasar, 2025) that students often face several difficulties such as difficulty interpreting images, slow information processing, low concentration levels, difficulty understanding CAD commands, and a lack of initiative in exploring application features. In the research by Putri & Ernawati (2022), students had difficulty understanding the steps for making sleeve patterns from written jobsheets alone. They mentioned that instructional videos were very limited, making the learning process less effective. This was also a complaint from students who were slow in completing their pattern-making assignments.

Gaol (2022) revealed that 12 factors of learning difficulties were identified among students, including psychological factors, vision problems, and uninteresting teaching methods. The researchers observed that students' ability to learn material without visual learning media was not optimal. In other words, without visual aids and supporting learning resources, these students had difficulty understanding concepts or techniques that were difficult to explain only with text or speech and should have been demonstrated visually.

To minimize students' difficulties in understanding CAD Pattern Making, as the lecturer in charge, the researcher attempted to utilize learning media in the form of videos as one of the strategies. The use of video tutorials is one technique in utilizing the results of learning technology in line with the increasingly advanced developments of the times as an effort to improve the quality of education (Lailani et al., 2023). The use of these learning videos aimed to minimize students' difficulties in understanding concepts in learning so that it could be more interesting, challenging, and increase curiosity and critical thinking.

Research conducted by Resendiz-Calderón et al., (2024) revealed that a combination of instructional videos and practical kits can strengthen the development of technical skills and maintain student motivation. This study focuses on the development of video learning media as an innovation in the context of CAD Pattern Making courses. The novelty of this study lies in the compilation of video content that not only explains the theory but also systematically guides the use of CAD Pattern Making application features through step-by-step demonstrations. The interactive and practical video structure is expected to fill the gaps in previous learning media and significantly improve students' understanding and skills.

The importance of educational videos in creating an engaging learning process is also supported by Basri et al (2023), who argue that university students benefit greatly from educational videos, namely in terms of efficiency, flexibility (they can be replayed), and consistency in the delivery of material. Video tutorials are systematically designed media consisting of images and sounds that form a sequential storyline, containing learning materials packaged in video files (Farida & Marniati, 2023). This is, of course, because educational videos consist of images and sound presented simultaneously, thereby capturing someone's attention—in this case, students.

Pardana & Hidayati (2024) also explain that educational videos are a highly effective learning medium that is easily accessible and practical. Therefore, the development of these educational videos is expected to make a tangible contribution to optimizing the CAD Pattern Making learning process, while also serving as an easily accessible reference for students to explore the material independently.

METHOD

This study uses a qualitative approach with the aim of developing and evaluating video learning media for the CAD Pattern Making course. The research subjects consisted of 30 third-semester students from the Family Welfare Education Study Program. The video learning development stage included several stages, namely: needs analysis,

design, development, validation, implementation, and evaluation. Data collection was conducted through interviews and observations to explore students' experiences and obstacles during the learning process, distribution of questionnaires to measure student satisfaction with the learning videos in terms of ease of understanding, visual quality, and the effectiveness of the videos in supporting practice, as well as supporting documentation.

The learning video was validated by two experts in CAD Pattern Making and one learning media expert to ensure content suitability, technical accuracy, and delivery quality. Input from the validation was used for revision and refinement. With this approach, the researchers sought to explore data to analyze the extent to which educational videos can optimize the learning process, as well as to understand how students experience and interpret the use of these media in CAD Pattern Making practice activities.

RESULTS AND DISCUSSION

RESULT

This study aims to optimize the learning process of making camisole patterns using CAD Pattern Making through learning videos that have been prepared as well as possible. This study began by analyzing the phenomena that occurred among third-semester students in the Family Welfare Study Program in understanding how to make and develop camisole patterns. As the basis and initial stage of clothing production, patterns play a very important role. To obtain accurate results and sizes that fit the body, it is very important to be precise in making and developing patterns. After conducting in-depth open interviews, the researcher was able to analyze that most students had difficulty making patterns using CAD Pattern Making using jobsheets and handouts, and this became the basis for the researcher to create instructional videos.

Based on a survey of student satisfaction levels in the use of CAD Pattern Making instructional videos, 30 respondents strongly agreed that CAD Pattern Making instruction should be supplemented with instructional videos. Instructional videos on creating and developing camisole patterns using CAD Pattern Making were designed and developed by researchers to include and adapt videos to the expected learning outcomes of students. In accordance with the achievement indicators, several sections included in the instructional video are: learning objectives, how to install CAD Pattern Making, introducing the features or tools used in creating and developing patterns in the CAD Pattern Making application, steps for creating patterns, easy tips for creating and developing camisole patterns, and displaying the final results of the patterns that have been created. The following is a description of each important section contained in the instructional video.

Learning Objectives

The learning objectives can be referred to as indicators and benchmarks of student achievement from the initial stage to the final stage of pattern making. At the beginning of the instructional video, students read the learning objectives presented by the lecturer. The learning objectives of making camisole patterns are to provide knowledge and skills in designing, making, and understanding camisole patterns, which are the basis for producing clothes that match the desired design and size. Based on the learning objectives presented in the instructional video, the focus of achievement is on the process. If the manufacturing process is carried out correctly and thoroughly, the final result will also be optimal.

According to the students, the learning objectives can be better understood, and they can focus on what the lecturer expects from the lecture material. In this case, the learning objectives are for students to understand the techniques of creating camisole patterns using CAD Pattern Making and to be able to create patterns using CAD Pattern Making. From the learning objectives formulated above, students are expected to be able to use CAD Pattern Making so that camisole patterns can be created digitally. Thus, the expected results can be better and the work more meticulous.

How to install CAD Pattern Making

CAD Pattern Making is an application installed on students' computers/laptops. CAD Pattern Making is the process of creating digital patterns using a computer device. The use of this application can produce more accurate patterns and minimize errors. The first step in using CAD Pattern Making is for students to install the application, after which the lecturer provides a win zip file to be saved on their computers/laptops.

Based on interviews with students, it was found that all students had installed the application on their computers/laptops. According to the students, through the video, they were able to easily follow the steps and instructions for installing the application. In this case, students were required to install the application on their computers/laptops so that they could watch the instructional video again whenever they wanted. Some students also explained that this learning method is interesting because by starting with installing the application, they immediately move on to practical learning, and this becomes a learning experience that provides them with direct experience.

Getting to know the CAD Pattern Making tool

In the prepared learning video, the next step that students must understand is the tools available in CAD Pattern Making. Tools are the devices or components within the CAD Pattern Making application, or in other words, the tools used to facilitate students in using the application. The tools that are always utilized when using CAD Pattern Making play a crucial role in creating and developing clothing patterns, specifically camisoles. After familiarizing themselves with the tools, students must understand the function of each tool that will be used in pattern creation.

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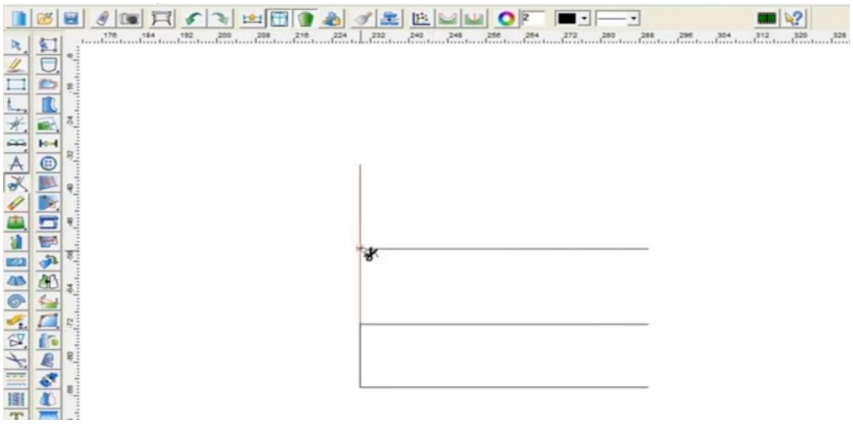

FIGURE 1. Tools in the CAD pattern making application.

Based on the image above, it can be seen that there are many CAD application tools used in creating digital clothing patterns. Each tool has a different function in creating patterns, and students revealed that sometimes they cannot understand the entire function of the tools in one class. Those who do not understand can also be guided by other fellow students so that they can work together in creating camisole patterns using CAD. Thus, the explanation of the CAD tool functions in the learning video can be understood by students.

Steps in Creating Patterns

An important aspect of the instructional video on creating camisole patterns for third-semester students is the step-by-step process of pattern creation. In this section, the researcher explains in detail how to create patterns, starting from the initial steps until the final pattern is complete. Students also find it easier to follow the pattern creation steps by paying close attention to the video presentation.

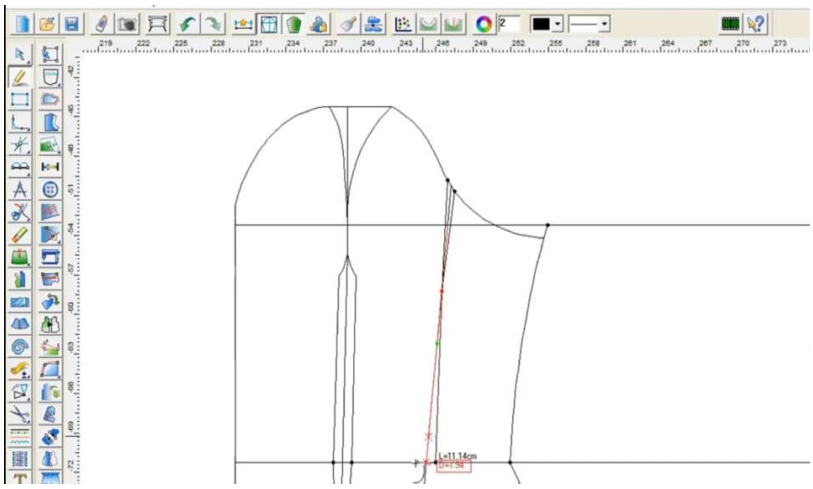

FIGURE 2. Steps for creating a camisole pattern using cad pattern making.

Based on Figure 2, it can be understood that the CAD Pattern Making application can be used to create better patterns because it is easier to use the tools available in the application. The interview results also show that students feel that the difficulties in creating camisole patterns can be overcome by using this digital application.

Easy Tips for Creating and Developing Camisole Patterns

The video also shows how students can more easily create camisole patterns. Some tips provided in the video to help students are to create a basic sketch. By understanding the basic sketch, students can more easily complete the pattern creation process to the next stage. Another tip shared by the instructor during the camisole pattern-making activity is to adjust the pattern size to the needs. This means that when using the Cad Pattern Making application, students should use the scale on the sketch with the actual size.

Final Results of the Camisole Pattern

In the instructional video, the researcher, who is also a lecturer, shows the final results of the pattern made using Cad Pattern Making.

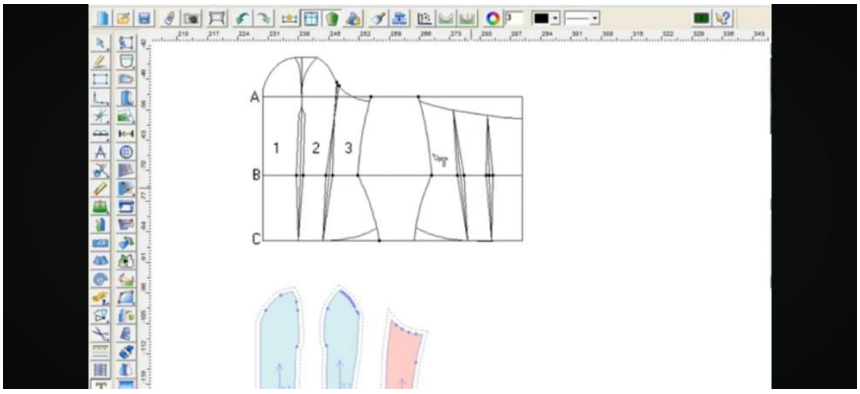

FIGURE 3. Final results of the camisole pattern making activity.

Figure 3 shows the results of the camisole pattern shown in the instructional video. This final result was obtained using CAD Pattern Making. In this study, several students said that their final results were not exactly the same as those shown in the video, but they tried repeatedly and said that the results they obtained showed improvement.

DISCUSSION

The instructional video designed by researchers as a visual learning medium on how to use CAD Pattern Making. Students can more easily understand the steps in pattern making with clear and detailed visual explanations in the instructional video. This is in line with the research by Wati et al., (2024), which shows that tutorial videos successfully empower students to learn independently and improve their pattern-making skills, which can encourage better information absorption by students. This video is also believed to encourage students to engage in independent learning outside of class hours as it can be played repeatedly. This is in line with the findings of Iranda & Rahmawati (2023), which explain that instructional videos can increase effectiveness, allow for replay and interaction. Instructional videos are also seen as contributing to self-development and broader knowledge, as well as fostering a positive attitude towards education as a whole. All of this ultimately leads to improved academic outcomes for students and helps them discover their interests and passions in specific fields, which is crucial for their future careers.

The instructional videos provide clear visual demonstrations of the techniques and processes involved in creating camisole patterns. This media is believed to be able to facilitate learning, especially for users who are learning to operate certain software or computer behaviors displayed on the monitor screen (Muslichah et al., 2022).

Through these instructional videos, it is believed that students can see and observe each step of pattern making directly, understand the application of theory in practice, and follow instructions more easily. The instructional video also allows students to repeat the material as needed, so they can learn at their own pace. Thus, the instructional video not only improves students' understanding and technical skills but also encourages creativity and innovation in design, which is essential in the field of fashion design.

Furthermore, the use of instructional videos in CAD practice also supports 21st-century skills such as independent learning, digital literacy, and technical skills. According to Anggraini et al (2021), learning that combines information technology is considered capable of responding to the challenges of skills-based learning in the digital age.

Developing videos as a learning medium requires pattern making to consider several criteria and include several important aspects, including: 1) Conveying learning objectives, 2) How to install the Cad Pattern Making application, 3) Introducing the tools available in the Cad Pattern Making application, 4) Steps for making patterns, 5) Easy Tips for Creating and Developing Kamisol Patterns, 60 final displays of kamisol patterns created using Cad Pattern Making.

The use of CAD in creating clothing patterns requires spatial visualization skills and technical accuracy. Learning videos can optimize the CAD Pattern Making learning process in the Family Welfare Education Study Program, showing that students can directly observe the use of software features such as point determination, measurement, line joining, and pattern stimulation, which were previously difficult to explain through lectures or printed teaching materials alone.

CONCLUSION

In an effort to optimize learning in creating camisole patterns using CAD Pattern Making software, the use of instructional videos is effective in optimizing learning. With the optimization of instructional videos, lecturers can be more efficient in delivering technical material, while students have flexible and repeatable access to learning. This can be analyzed from the results of interviews with students, supported by direct observation in the pattern-making learning process, and also supported by documentation of the aspects present in the video footage. The results of the study show that based on interviews with students as respondents, the learning stages shown in the instructional videos greatly helped students understand and create camisole patterns better because all stages were explained in detail and could be replayed. The learning videos that have been designed cover the following aspects: how to install the CAD Pattern Making application, 3) introduction to the tools available in the CAD Pattern Making application, 4) steps for creating patterns, 5) easy tips for creating and developing patterns, 6) the final appearance of the patterns created using CAD Pattern Making. Further research and development are recommended to add interactive features to the video, such as live exercises and evaluation quizzes, as well as improvements in audio and visual production quality.

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