



## Development of Learning Video Media on Pattern Transfer Techniques to Fabric (TEKA) for Pattern-making Making Subjects

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**Abstract:** This study aims to develop and determine the feasibility of the TEKA (Technique for Transferring Patterns to Fabric) instructional video as a learning medium for the Pattern Making subject at SMK Negeri 7 Malang. The research employed a Research and Development (R&D) approach using the 4D development model (Define, Design, Develop, and Disseminate). The media was validated by subject matter experts and media experts and was tested on a limited scale involving 30 tenth-grade students from the Fashion Design and Production program at SMK Negeri 7 Malang. The validation results from subject matter experts showed an average score of 3.81, categorized as "Highly Feasible," with the material relevance aspect receiving a perfect score of 4.00. Media experts gave an average score of 3.66, with the highest rating on the operability aspect (3.71). The student trial yielded a satisfaction score of 85.7%, demonstrating that the media is suitable as an innovative tool for teaching pattern-transferring techniques onto fabric. The media effectively addressed students' difficulties in visualizing and transferring patterns from paper to fabric. Its strengths lie in the systematic presentation of material, flexible usage, and its function as both an independent learning tool and a classroom supplement. The study recommends regular content updates to align with industry developments and suggests developing similar media for other competencies. These findings emphasize the importance of technology-based media innovation in enhancing the quality of vocational education.

**Abstrak:** Penelitian ini bertujuan mengembangkan dan mengetahui kelayakan media video pembelajaran TEKA (Teknik Memindahkan Pola ke Kain) untuk mata pelajaran Pembuatan Pola di SMK Negeri 7 Malang. Metode penelitian menggunakan pendekatan *Research and Development* (R&D) dengan model pengembangan 4D (*Define, Design, Develop, dan Disseminate*). Media divalidasi oleh ahli materi dan ahli media, serta diuji coba terbatas pada 30 siswa kelas X Desain dan Produksi Busana SMK Negeri 7 Malang. Hasil validasi ahli materi menunjukkan skor rata-rata 3,81 (kategori "Sangat Layak"), dengan aspek kesesuaian materi mencapai skor sempurna 4,00. Ahli media memberikan skor rata-rata 3,66, dengan penilaian tertinggi pada aspek pengoperasian (3,71). Pada uji coba siswa, diperoleh nilai kepuasan mencapai 85,7% sehingga media layak digunakan sebagai inovasi dalam pembelajaran teknik memindahkan pola ke kain. Media ini terbukti efektif mengatasi kesulitan siswa dalam memvisualisasikan dan memindahkan pola dari kertas ke kain. Keunggulan media terletak pada penyajian materi yang sistematis, fleksibilitas penggunaan, dan kemampuannya sebagai alat bantu mandiri maupun pendamping pembelajaran di kelas. Penelitian ini merekomendasikan pembaruan konten berkala agar tetap relevan dengan perkembangan industri serta pengembangan media serupa untuk kompetensi lain. Temuan ini menegaskan pentingnya inovasi media berbasis teknologi dalam meningkatkan kualitas pendidikan vokasi.

## A. Introduction

The rapid advancement of science and technology has affected almost all human life. From the Industrial Revolution to the current digital age, these developments have had a significant impact on various fields, including the education sector (Sandiyanti, 2018; Harjanto et al., 2022). Technology is now one of the solutions in education, especially in answering the challenges of limited space, time, and access to equitable learning resources. As stated by Nurmadiyah & Asmariansi (2019), technology integration in education can bridge various barriers in the teaching and learning process.

In facing the era of globalization that demands rapid adaptation to change, the world of education is required to continue to innovate. Education in Indonesia, including in the Vocational High School environment, must utilize advances in information and communication technology to improve the quality of learning. Mukhlason et al (2020) emphasized that the quality of education can be seen from the results of graduates, namely those who are competent, adaptive to change, and able to face future challenges.

SMK has a strategic role in producing skilled workers ready to compete in the industrial world. Its primary objective, vocational education, is to prepare students to master practical skills and be ready to work. This is reinforced by the opinion of Gamaliel et al (2022) that SMK is a secondary education level that specifically prepares students to go directly into the world of work. On the other hand, Nurhazizah & Puspaneli (2024) stated that SMK also provides technical skills and basic knowledge that sustainably supports students' career development.

Excellent human resources are rooted in a quality education system. Teachers are key in creating a conducive and innovative learning atmosphere in this case. Teachers are not only conveyors of information but also learning facilitators who can utilize technology and create methods and media that are by the characteristics of today's learners. According to Fauth et al (2019), improving the quality of education cannot be separated from the contribution of teachers in transforming learning through innovations relevant to the needs of the times. Wahyuni et al (2023) also emphasized the importance of learning innovation in encouraging active student involvement and increasing the effectiveness of the learning process.

One effective learning strategy is the use of technology-based media. Learning media is a tool that allows the delivery of material to be more concrete, interesting, and easy to understand. Firmadani (2020) mentions that media plays a role in presenting learning concepts and procedures in a real way to strengthen student understanding. Appropriate media innovation can create less boring and more interactive learning (Hamid et al., 2020).

Among the various types of learning media, video is one of the most widely used due to its visual appeal and ability to explain processes sequentially. Learning videos are helpful, especially in practical subjects such as those taught in vocational schools. Carolin et al (2020) state that videos harmoniously combine sound, text, and moving images to support fun and motivating learning for students.

SMK Negeri 7 Malang is a vocational school with a Fashion Design and Production expertise program. This program equips students with skills in designing and making clothes and understanding the production process. One of the key subjects in this program is Pattern Making, where students are taught how to make fashion patterns according to the user's body size. According to [Irmayanti \(2017\)](#), pattern-making is an important basis in fashion production because it determines the shape and final result of the clothes made.

The results of observations made in class X DPB 3 SMK Negeri 7 Malang showed that only 10 out of 32 students managed to meet the KKM scores in the Midterm Examination (UTS) for Pattern Making subjects. Thus, only about 31.25% of students reached the standard of learning completeness, while the rest had to take remedial courses. Through interviews with the teaching teacher, it was found that the main difficulty experienced by students was in transferring patterns from small scale sizes (e.g. 1:4) to real size on the fabric. Although students had made a material design, many still had difficulty applying it to the fabric-cutting process because they did not fully understand the proper steps.

The mismatch of size and pattern arrangement on the fabric often leads to confusion and errors in the production process. In addition, some students have not been able to arrange patterns efficiently to minimize the use of fabric. This means the teacher has to explain repeatedly so that students understand the pattern transfer technique correctly and are not wasteful in using materials. [Irmayanti & Hadi \(2018\)](#) explained that accuracy in the Pattern determines the quality of the final result of the clothes worn.

An appropriate solution is needed to overcome students' difficulties in understanding this process. One practical alternative is the development of learning video media that can provide clear visualization of work steps and be played back as needed. According to Munandi (in [Syaparuddin & Elihami, 2020](#)), learning videos can transform abstract concepts into something real and easily understood by students and expand their imagination.

Previous research has also shown the effectiveness of video media in improving student skills in practical lessons. For example, [Syafitriani & Suhartini \(2023\)](#) proved that learning videos on trouser sewing material increased student interest in learning and facilitated understanding of work steps. Similarly, [Clarisyia et al \(2024\)](#) stated that video learning sewing techniques proved helpful in students' learning process at SMK Negeri 2 Sewon.

Looking at the existing problems and the literature review results, the researcher developed learning video media that explicitly discusses the Technique of Transferring Patterns to Fabric (TEKA). This technique includes transferring patterns from paper to fabric efficiently and precisely ([Arkadiantika et al., 2020](#)). [Fitra \(2020\)](#) states that putting patterns on fabric requires high accuracy because placement errors can significantly impact the final result of the garment.

TEKA video media has material focus advantages not discussed in depth in previous learning media. In addition, this media is systematically arranged following the curriculum and learning outcomes of class X, majoring in Fashion Design and Production at SMK Negeri

7 Malang. Teachers can use this video in classroom learning and as independent teaching materials that students can access anytime.

This research aims to develop and evaluate the feasibility of TEKA learning video media for vocational students' practical learning process. With this media, students' constraints in understanding the concept of pattern transfer are expected to be minimized. Specifically, the research objectives include preparing learning videos that present the steps of pattern transfer techniques in a coherent, clear, and easy-to-understand manner. Media feasibility was evaluated through material and media expert validation and student trials to assess its effectiveness from a direct user perspective.

## B. Method

This type of research is research and development, this development research aims to produce a product in the form of video learning media TEKA (Technique of Transferring Patterns to Fabric). The approach used in this research is descriptive quantitative, which explains the product development process and measures the feasibility of the resulting media based on input from experts and users (Sugiyono, 2015).

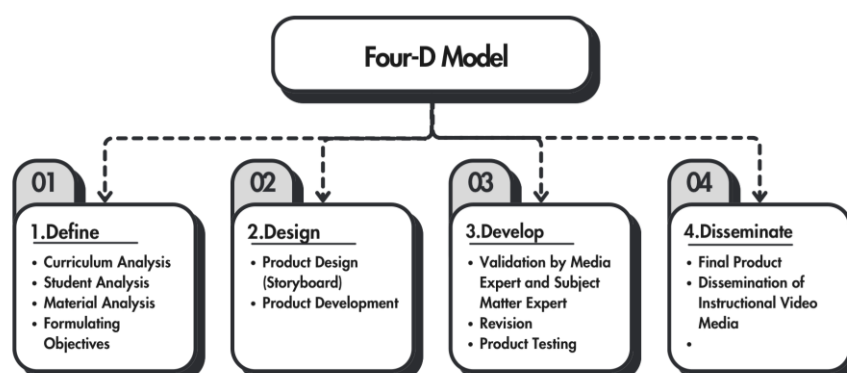


Figure 1. 4D Research Flow

The development model refers to the 4D stages (*Four-D Model*) developed by Thiagarajan et al. (1974). This model consists of four main stages: *define*, *design*, *develop*, and *disseminate*. In the defining stage, researchers conducted preliminary activities such as curriculum analysis, observations of student conditions in the field, and interviews with subject teachers. This stage aims to identify student needs and learning challenges faced, especially in the material of pattern transfer techniques to the fabric (Rajagukguk et al., 2021).

Furthermore, the design stage is completed by compiling the initial product framework through *storyboards* and learning video scenarios. This design was prepared based on the results of the previous analysis. It paid attention to the principles of preparing media that were interesting, interactive, and easy for vocational students to understand. At this stage, the correct visual presentation format and narration are also considered so that users can receive the information conveyed well.

The next stage is development, which is the process of producing learning videos based on the design that has been compiled. After the media has been developed, validation

is carried out by two parties: material experts and media experts. This validation aims to assess how much the media meets the content, technical, and function standards as a learning tool. After validation and revision, the media was tested on a limited basis by students in class X of the Fashion Design and Production Expertise Program at SMK Negeri 7 Malang. In this trial, students were asked to provide feedback through a questionnaire regarding the media's clarity, appearance, and benefits.

Data from the validation and pilot test were analyzed quantitatively using a Likert scale, which consists of four categories: strongly agree (4), agree (3), disagree (2), and disagree (1). The analysis was conducted by calculating the average value of all scores given by the respondents using the formula:

$$X = \frac{\sum X}{N}$$

Description:

X = Average value of each aspect

$\sum x$  = Number of validator scores

N = Number of validators

(Arikunto, 2009)

To interpret the assessment results, the eligibility category based on the average score is used as follows:

**Table 1.** Assessment Categories

Average Score	Rating Category
1,00-1,75	Less Feasible
1,75-2,05	Decent Enough
2,05-3,25	Worth
3,25-4	Very Feasible

(Mardapi, 2008)

The subjects in this study were 30 students of class X majoring in Fashion Design and Production at SMK Negeri 7 Malang. Meanwhile, the research object is the developed learning video media. The purpose of student involvement in the trial was to determine the user's response to the media and measure the extent to which the media was effective in assisting the practical learning process.

The final stage, dissemination, involves sharing the learning video with teachers and students through digital files and video links uploaded to the YouTube platform. This step aims to make the media available for use in classroom learning or independently outside of class hours and to provide wider access for other users who need similar materials.

Through these four stages, this research is expected to produce learning media that is valid, feasible, and effective in improving students' understanding of the material on pattern transfer techniques to fabric, as well as providing alternative innovative learning media for teachers in the SMK environment.

## C. Result

This research produces learning media in the form of videos that focus on transferring patterns to fabric (TEKA), which are intended to support the practical learning process of class X students in the Fashion Design and Production Expertise Program at SMK Negeri 7 Malang. The video development process is carried out through the initial three stages of the 4D model: defining, designing, and developing, followed by limited distribution. The following are the stages of development carried out:

### 1. Define

At the *define* stage, several stages were carried out, which consisted of: a) initial analysis through observing the results of student assessments and also interviews with pattern-making subject teachers, b) analyzing students by observing their characteristics so that it is known that there are students who experience problems in understanding the technique of transferring patterns to fabric, c) task analysis carried out by observing the tasks that must be mastered by students in order to achieve the specified learning outcomes, d) concept analysis by identifying the material taught to students which aim to determine the content of the media to be developed, e) formulating learning objectives related to the material to be delivered.

### 2. Design

The design stage in learning video media is a crucial element that aims to carefully design and create an effective design to achieve optimal results in delivering the material. This process involves two main steps. First, it is important to select the learning media that best suits the characteristics of the content to be taught and the learning objectives to be achieved. The correct selection of media will ensure that the learning information can be properly conveyed to the students.

Secondly, it is crucial to determine the appropriate presentation format. This includes designing a logical sequence of material to ensure a clear and easy-to-understand flow and a *storyboard layout* that helps organize the visual and audio sequences in an organized manner. In addition, choosing the right writing style for the learning media is also an important element that affects the effectiveness and appeal of the learning video. The following is an image of the initial product of TEKA learning video media:



Figure 2. Initial Product Image

### 3. Develop

The video media was designed at this stage by compiling the initial product framework as a *storyboard*. Here is how the product looks before and after design:

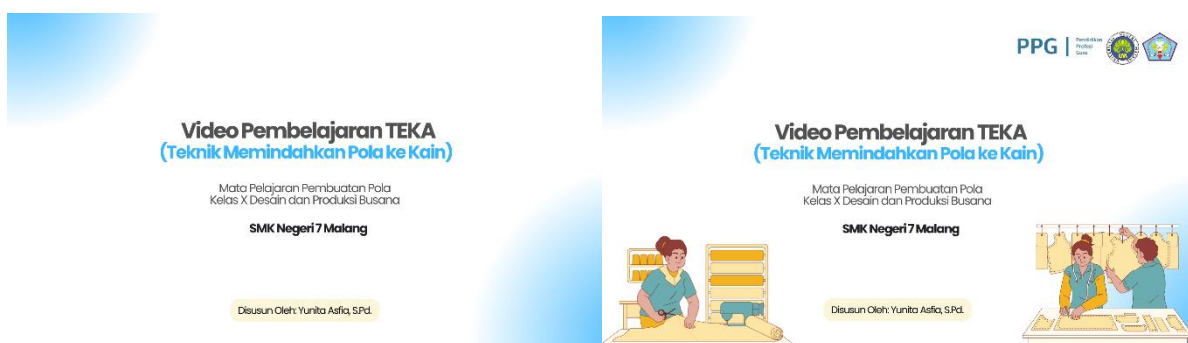


Figure 3. Product Display Before and After the Design Process

The product was then produced and tested by two parties, namely material experts and media experts. The material expert validation showed that the media had fulfilled the aspects of content suitability, material depth, information truth, and actuality. The material suitability dimension obtained the highest score of 4.00, and the average score was 3.81. This indicates that the video content is relevant to vocational schools' curriculum standards and learning needs.

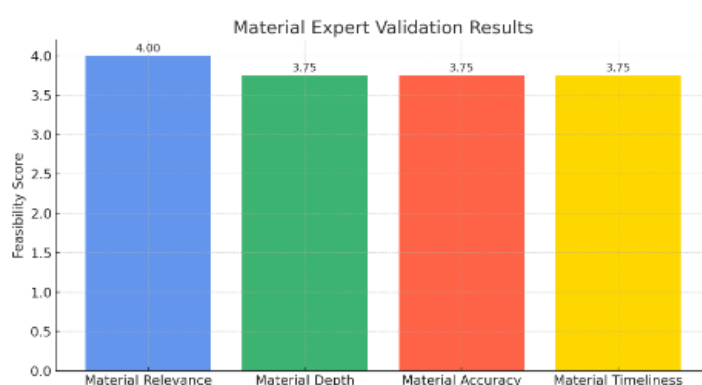
Table 2. Material Expert Validation Results

No.	Dimensions	Feasibility Score	Rating Category
1.	Material Suitability	4	Very Feasible
2.	Depth of Material	3,75	Very Feasible
3.	Correctness of Material	3,75	Very Feasible
4.	Actuality of Material	3,75	Very Feasible
Average Score		3,81	Very Feasible

Based on the results of the material expert validation in Table 2, the highest score was given to the material suitability aspect, with a feasibility score of 4, which means it is very

feasible. This shows that the experts assessed that the video content is very relevant to the applicable curriculum standards, student needs, and the intended basic competencies. This indicates that the media has been developed based on appropriate material references, both theoretically and practically.

The material depth dimension obtained a feasibility score of 3.75, which means it is feasible. The material depth dimension measures the extent to which the material presented covers important aspects in depth. The material truth dimension obtained a score of 3.75, which means it is very feasible. This shows that the material's content is based on scientific principles and professional practices in the field of fashion. In the dimension of material actuality, a feasibility score of 3.75 was obtained, which means it is very feasible. This shows that the material is relevant and *up-to-date* with technological developments and practices in the fashion industry.



**Figure 4.** Material Expert Validation Results

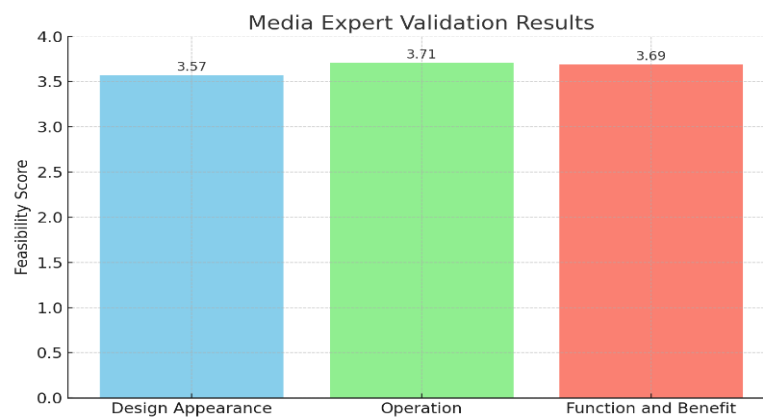
From all dimensions analyzed, an average score of 3.81 was obtained, which means that it is very feasible, so it can be concluded that TEKA learning video media has met the eligibility criteria for content. The material is considered appropriate, accurate, in-depth enough, and actual. The material expert stated that the work procedures had been arranged systematically and advised that it would be nice if an example of an ergonomic workplace image was included and added how to fold carbon paper on the good and bad parts so that there were no errors that caused the pattern marks to be invisible.

The subsequent validation is validation from media experts who assess aspects of visual appearance, ease of operation, as well as the functions and benefits of the media obtained the following results:

**Table 3.** Media Expert Validation Results

No.	Dimensions	Feasibility Score	Rating Category
1.	Display Design	3,57	Very Feasible
2.	Operation	3,71	Very Feasible
3.	Functions and Benefits	3,69	Very Feasible
Average Score		3,66	Very Feasible

Table 3 shows that the display design obtained a feasibility score of 3.57, which means it is very feasible. The display design includes visual aspects such as *layout*, color combination, font selection, and overall aesthetics of the media. This score indicates that the learning video media has been well-designed. In the operation dimension, a score of 3.71 is obtained, which means it is feasible. The high score in this dimension indicates that the media has been well-designed, accessible, usable, and technically understood. In the function and benefit dimension, a score of 3.69 was obtained, which means it is very feasible.



**Figure 5.** Media Expert Validation Results

From the three dimensions assessed, an average score of 3.66 was obtained, which illustrates that this learning video media is feasible and has met quality standards regarding visual design, operational ease, and functions and benefits. These results reinforce that the media is suitable for use as a supporter of the practical learning process of vocational students and has the potential to improve mastery of pattern transfer techniques to the fabric. Media experts state that, in general, the media is good only when writing the bibliography; please do not use et al., but it must be written with the author's full name.



**Figure 6.** Bibliography Before and After Revision

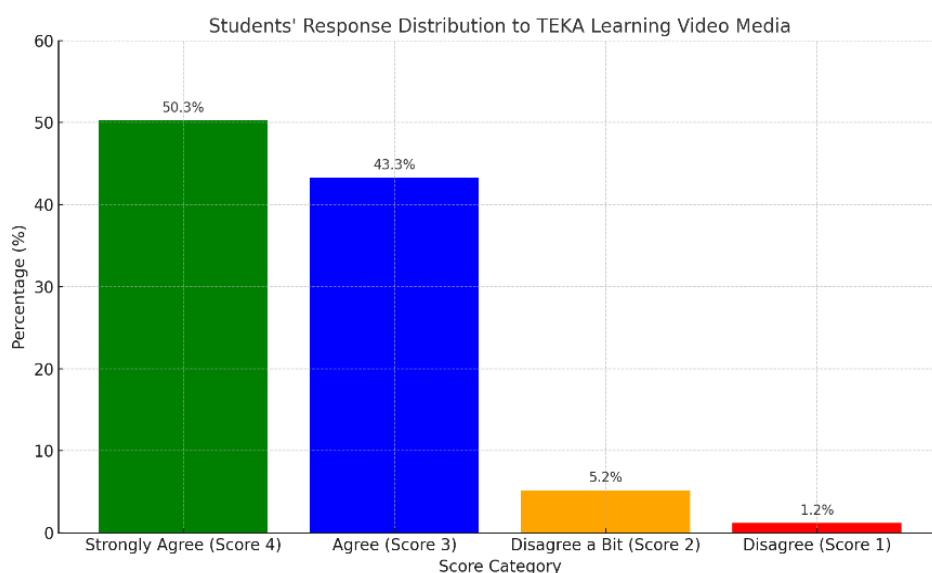
After material experts and media experts declare the media's validity, a limited trial is carried out to 30 students in class X Fashion Design and Production at SMK Negeri 7 Malang. Students were asked to fill out a questionnaire as an assessment instrument for the learning

video media that the researcher had developed. The rating scale used is a Likert scale with four answer categories: 4 (strongly agree), 3 (agree), 2 (disagree), and 1 (disagree). The following is a description of the results of the limited trial conducted on students:

**Table 4.** Student Limited Trial Results

Score Category	Number of Answers	Percentage (%)
Strongly Agree (Score 4)	332	50,3%
Agree (Score 3)	286	43,3%
Disagree (Score 2)	34	5,2%
Disagree (Score 1)	8	1,2%
Total	660	100%

Based on the data collected from 30 students who answered 22 questions about the TEKA (Technique of Transferring Patterns to Fabric) learning video media, the survey results show that most students responded positively. A total of 332 responses (50.3%) chose Strongly Agree (Score 4), while 286 responses (43.3%) chose Agree (Score 3). Overall, students consider TEKA video media perfect for visual design, ease of use, and effectiveness in supporting pattern-making learning.



**Figure 7.** Distribution of Student Answers

In addition, only 34 responses (5.2%) chose Disagree (Score 2), and eight responses (1.2%) chose Strongly Disagree (Score 1), indicating that very few students expressed dissatisfaction. Overall, the average score reached 75.4 out of a maximum score of 88 with a percentage of 85.7%, indicating that this learning media is effective and suitable as an innovation to teach pattern transfer techniques to the fabric.

#### 4. Disseminate

Media dissemination is done by uploading learning video media to social media, namely *YouTube*, and sharing learning video media with pattern-making subject teachers in the form of video files along with *YouTube* links. The *YouTube* link can be accessed by everyone so that the TEKA learning video media (Techniques for Transferring Patterns to Fabric) can be utilized as a learning media reference, especially for students at the SMK level majoring in fashion.

#### D. Discussion

The evaluation results of the TEKA (Technique of Transferring Patterns to Fabric) learning media show an average score from the material experts of 3.81, which is included in the very feasible category. This value supports the initial hypothesis that TEKA media is feasible as a practical learning tool. This validation confirms that the material presented in the media is based on the basic concept of transferring patterns to fabric, which requires visual skills and practical steps. This result is in line with the opinion of [Gagné & Briggs \(1987\)](#), which states that effective learning media must meet the requirements of clarity of purpose, material integration, and user participation level.

In addition, the assessment from media experts obtained an average score of 3.66, including in the very feasible category. This shows that TEKA media has design aspects that support the learning process regarding visual appearance, clarity of step instructions, and ease of use. This media displays an overview of the steps of transferring patterns to fabric in detail, with audio explanations that help students understand. In addition to the validation process from experts, direct testing of students showed a satisfaction level of 85.7%, which indicates a very positive response. This proves that TEKA media can attract attention and deepen students' understanding of the technique of transferring patterns to fabric. This result also strengthens the initial prediction that TEKA media can be an innovation that facilitates learning basic fashion skills.

There is a connection between the results of this study and previous research conducted by [Syafitriani & Suhartini \(2023\)](#), who examined the Development of Learning Video Media for Sewing Women's Pants Class XI Clothing at SMK Negeri 1 Jabon Sidoarjo. The results of material expert validation show a score of 3.75 with a very valid category, and media experts get an average result of 3.04, which is classified as valid. Student response is also very positive, with the acquisition reaching an average of 3.42, which is classified as an outstanding category. This study found that the development of learning video media for sewing women's trousers increased student interest in the material of sewing women's trousers and increased students' willingness to learn and understand learning.

This shows that TEKA video development research results align with the basic concepts of effective learning media development, support the hypothesis that TEKA media is feasible to use, and are consistent with other relevant research. The real facts in the form of high validation scores and significant student satisfaction support the conclusion that TEKA

media is a valuable learning innovation for students in learning pattern transfer techniques to the fabric.

### **E. Implication**

The results of this study show that the use of TEKA learning video media positively influences the learning process of the technique of transferring patterns to fabric. Theoretically, this finding reinforces the idea that visuals and audio are essential in facilitating the understanding of abstract and technical concepts. This evidence supports the principles of [Gagné & Briggs \(1987\)](#), which emphasize the importance of presenting material in a structured and experiential way to increase learning effectiveness.

TEKA media can be a real solution to overcome various challenges in learning practices in vocational schools, especially in the field of fashion. This media makes it easier for teachers to explain the material, increase students' enthusiasm for learning, and provide opportunities for students to learn independently outside class hours. These implications are relevant to vocational education needs, which demand adequate mastery of skills. From a social aspect, this research opens up opportunities for developing technology-based learning media that are inclusive and accessible to all students, including those who have difficulty understanding abstract concepts conventionally.

### **F. Limitation and Suggestion for Further Research**

The development of learning media in the form of TEKA videos has several important limitations. First, media testing was only conducted in one school, SMK Negeri 7 Malang, with trial participants limited to 30 class X students from the Fashion Department. This limits the ability to apply the results more widely, especially in other schools with different student characteristics, facilities, or curricula. Secondly, this study has not fully measured how effective TEKA media is in improving the learning outcomes of students' cognitive aspects and psychomotor skills through quantitative data. Therefore, how far this media can significantly improve student learning achievement still requires further research with experimental or quasi-experimental methods.

### **G. Conclusion**

The development of TEKA (Technique of Transferring Patterns to Fabric) video learning media successfully fulfills the main objective of the research, which is to produce a learning tool that is feasible, efficient, and innovative to help the learning process of transferring patterns to fabric. This media makes it easier for learners to understand complex concepts by presenting visual demonstrations that are systematic and easy to follow. In addition, this media is proven to increase students' understanding and motivation. Assessments from material and media experts showed high results, while the level of student satisfaction reached the excellent category. Thus, TEKA media supports the learning of fashion practice and encourages technology integration in vocational education.

The results of TEKA media development have a positive impact on the development of vocational education in fashion. This media serves as a tool in the classroom and supports independent learning thanks to flexible access, so students can repeat the material as needed independently. The development method applied, namely the 4D model (*Define, Design, Develop, Disseminate*), shows that the needs-based development process and technological innovation can produce learning products that meet the needs of students. This finding can be used as a reference for developing learning media in other vocational competency areas, as well as strengthening the technology-based learning ecosystem in vocational high schools.

Several strategic steps are needed to ensure sustainability and improve the quality of the media. Regular content updates are important to keep the materials relevant to industry developments. Expansion of trial coverage to higher grade levels and developing media variants for other competencies are also recommended to strengthen the long-term impact of learning media innovation.

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