

**EXPLORATION OF WELT POCKET CONSTRUCTION IN MEN'S APPAREL
USING PARANG BATIK FABRIC**

Yosi Rizal¹, Awwali Ibnu Wardaya², Putri Marganing Utami³, Sri Emy Yuli Suprihatin⁴, Enny Zuhnikhayati⁵

Yogyakarta State University

E-mail: yosirizal@uny.ac.id, awaliibnuwardaya@uny.ac.id, putrimarga@uny.ac.id, sri_emy@uny.ac.id,
enny_zuhnikhayati@uny.ac.id

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ABSTRACT

Constructing welt pockets using parang batik fabric requires precise sewing techniques to preserve the continuity of diagonal motifs. This study explores welt pocket construction in men's apparel through the development of instructional media for Fashion Education learning. Close-up visualization of sewing stages, such as chalk marking, folding techniques, and pocket-corner notching, helped explain the procedures more clearly. The video product was developed using the 4D model (Define, Design, Develop, Disseminate) and involved expert validation and student trials. Both material and media evaluations showed high Aiken's V scores, indicating that the media was suitable for men's apparel practice. The participation of 15 students in the limited stage and 38 students in the wider stage showed better responses after improvements in narration, supporting text, and audio balance. During patterned pocket construction, repeated observation of the media helped students maintain stitching consistency more carefully. Overall, the developed video is feasible and effective for Fashion Education students while also introduces cultural values through the application of batik in modern men's apparel.

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INTRODUCTION

Batik as an intangible cultural heritage has been recognized by UNESCO as an Indonesian identity that has deep aesthetic and philosophical value [1]. The parang motif, one of the classic motifs from the Ancient Mataram Kingdom, is known for its diagonal arrangement which symbolizes strength, steadfastness and continuity of life [2], [3]. Contemporary fashion trends have driven the transformation of batik into an integral part of modern fashion [4], as it originally evolved from an unstitched lower garment known as *jarik* [5]. The development of batik in fashion has contributed significantly to the creative industry by strengthening local cultural identity [6]. However, many studies focus on the aesthetic aspects of batik, but its use in clothing construction techniques especially for parang batik is still limited, so further exploration is needed in contemporary men's apparel.

The adaptation of parang batik into modern men's apparel offers both opportunities and challenges, particularly determining the construction of clothing so that diagonal motifs are sewn symmetrically, with the urgency of advanced skills [4]. Its transformation into modern men's apparel began when it was designated as official attire for Civil Servants in 1970, further reinforced by the designs of Iwan Tirta and Poppy Dharsono [1], [7]. At its peak, batik was introduced at the international forum during the 1994 APEC Conference, where heads of state wore batik shirts as official clothing thanks to the initiative of President Soeharto [1]. Since then, batik has not only functioned as cultural heritage, but also become an integral part of modern men's apparel trends [8].

Men's apparel products have variations in the form of pocket welt which combine function and artistry. The welt pocket has a functional space that can hold watch or other small objects, while pockets can also serve as supplementary elements in clothing for aesthetic fashion purposes [9]. Challenges arise when using the diagonal parang batik motif in assembling pockets, because this motif requires high precision [10]. The continuity of the motif becomes very visible if the cutting and sewing process is overlapping, potentially causing defects that lower the standard of grade A men's apparel [11]. Pratiwi [5] emphasized the importance of determining the grain direction in batik as misplacement of the pattern can lead to asymmetrical garment construction. This is in line with the findings of Yunta et al. [12], which confirmed that errors in attaching the interfacing before cutting the fabric, such as stretching due to incorrect ironing techniques, affect the size of the pattern markings on the fabric. Furthermore, Che Ya et al. [13] as misplacement of the pattern can lead to asymmetrical garment construction. As highlighted in previous studies, motifs must be designed and adjusted to seamlessly merge with the garment without disrupting the integrity of the textile.

Although much research has been conducted on batik fashion, most of it still emphasizes cultural preservation strategies [3]. Meanwhile, studies that integrate batik into the construction of modern men's apparel for vocational learning are still very limited. In fact, this skill needs to be mastered by Fashion Education students considering local market segmentation with cultural values. Students early experience difficulties in grain accuracy, particularly in maintaining motif alignment, controlling fabric position, and achieving symmetrical construction. Accompanied by the technique of making pockets with precise parang motifs is often a challenge, both at the fabric cutting and sewing stages [2]. However, conventional teaching methods that rely on direct demonstrations limit knowledge transfer to sewing practice sessions [14]. This makes it difficult for students to repeat sewing procedures independently, as the material is not documented in detail and systematically [15]. As a result, many students quickly forget important steps in the garment construction process [16]. Therefore, a more effective and repeatedly accessible learning medium is needed, one of which is through the development of practice-based learning videos.

The development of information technology has transformed the delivery of material from conventional-based to digital [17]. Learning videos are one of the effective media to summarize procedural stages systematically in visual-auditory form, thus making it easier for students to observe and understand the process more clearly [18], [19]. Through repeated playback, students can actively construct their understanding, which is in line with the constructivist approach in learning [17]. In addition, the distribution of videos through digital platforms such as YouTube provides opportunities to expand the reach of learning while supporting access flexibility [18]. Thus, learning videos contribute to increasing learning independence, especially in Fashion Education.

Based on these conditions, the use of videos in Fashion Education learning is positioned as an andragogical medium that responds to needs in the digital era [20]. Accordingly, this research focuses on developing a video for making welt pockets for men's apparel made from parang motif batik with M33 interfacing material. The video is designed to present a precise procedure for sewing welt pockets with aligned motifs through detailed visual instructions. In addition, video-based learning has also been



proven to facilitate mastery of practical skills more effectively, because it allows learners to review difficult parts independently [21], [22]. Therefore, this study aims to explore the appropriate sewing techniques that can be easily made into tutorials through the development of learning video products. The resulting learning media meets the criteria of valid, practical, and effective to be used in Fashion Education [23].

METHOD

This study is a research and development employing the 4D model (Define, Design, Develop, Disseminate) proposed by Thiagarajan, Semmel, & Semmel [27] to produce an instructional video for Fashion Education. In the Define stage, problems were identified through men's apparel classroom observation and a review of related literature, focusing on students' difficulties in exploring accurate motif alignment when sewing parang batik pockets. In the Design stage, the instructional video was planned by organizing the content based on the sequence of sewing workflow, preparing video scenarios and identifying stages that required detailed shots, and designing evaluation instruments. The Develop stage involved producing the instructional videos, validating it with expert reviews, and testing it with students. The study employed expert validation and student response to examine the suitability of the develop instructional media for students' sewing exploration. The content validity was assessed using Aiken's V coefficient based on the judgments from three material experts and three media experts. The material validation process contained 15 assessment items related to learning objectives, content accuracy, material presentation, and language clarity. While the media validation instrument consisted of 12 items emphasizing video objectives, visual quality, audio narration, and instructional support. Feedback from experts was used as video update before conducting limited and wider trials. The Disseminate stage was carried out through classroom implementation, and the video was distributed via YouTube to allow students to access and repeat each step independently.

The participants in this study were students of the Fashion Education Study Program at Yogyakarta State University who were taking men's apparel practice courses. A total of 15 students participated in the limited trial and 38 students in the wider trial, selected using purposive sampling. Data were collected using student response questionnaires consisting of 20 items covering video objectives (VO), material clarity (MC), video quality (VQ), attractiveness (AT), and accessibility and effectiveness (AE). The data were analyzed using descriptive quantitative methods based on a 4-point Likert scale (1 = not appropriate, 2 = less appropriate, 3 = appropriate, and 4 = highly appropriate).

RESULTS AND DISCUSSION

Results

Students still had difficulty maintaining motif alignment which led to the development of an instructional video to support the sewing welt pockets accurately in men's apparel course. During the Define stage, a needs analysis revealed that students continued to struggle with maintaining the accuracy and alignment of the parang batik motif when constructing welt pockets. Conventional demonstration-based learning methods are considered less effective because not all students are able to observe in class, making it difficult for them to try again independently. Based on observations, there was a need for a more systematic, accessible, and repeatable instructional medium, one of which was through video-based learning.

Subsequently in the Design stage, the structure of the video content starting from preparing materials, cutting patterns, aligning motifs, to sewing and finishing techniques. The entire welt pocket



sewing procedure is presented as a unified conceptual framework in the instructional video, minimizing the possibility of student error. Certain detailed stages such as attaching the M33 interfacing or notching the pocket corners, required close-up visualization to emphasize the precision of the technique, making it easier for viewers to replicate the construction. Each shot section was packaged by storyboard preparation, pocket material descriptions and sewing tutorials to explain each step clearly. The evaluation instruments consisted of expert validation sheets and student response questionnaires, which assessed the clarity of sewing materials, the attractiveness of the media as a learning tool, and the accessibility of the video.

The video product was further validated by six experts during the Develop stage, three of whom were men's apparel subject-matter experts and the other was a media expert for the recording media. Thus, Aiken's V was applied to assess the content validity of both the selected material and media presentation aspects before testing the product with student respondents. An average Aiken's V score of 0.94 in the material aspect showed that the instructional content was suitable for tailoring practice and learning activities. The material expert appreciated that the presented content was communicative in explaining various types of welt pocket commonly used in popular men's apparel, including pocket names, typical shapes, and stitch characteristics based on garment types. For the media aspect, the average score of 0.769 was categorized as moderate, with expert feedback generally acceptable but highlighting limitations need improvement too. Several improvements mainly focused on enhancing audio clarity to ensure that the instructions could be clearly understood by respondents. The video could relatively facilitate learning activities as an instructional medium during sewing practice, with several notes for improvement based on expert feedback.

Following product validation, a limited and wider trial was conducted to examine the feasibility and effectiveness in classroom learning activities. Each evaluated aspect is interpreted with four average score categories: 3.26–4.00 (very good), 2.51–3.25 (good), 1.76–2.50 (fair), and 1.00–1.75 (poor). The limited trial involved 15 respondents (two levels of students) and produced an average score of 54.67, which falls into the “Good” category. Overall, the instructional video was able to facilitate the learning process, although several aspects still needed improvement. The detailed are provided in Table 1.

Table 1. Results of the Limited Trial Response

Assessment Aspect	Respondents		Σ	$\bar{x}$
	Smt 3	Smt 5		
Video Objectives (VO)	46	78	124	2,72
Material Clarity (MC)	88	155	242	2,66
Video Quality (VQ)	78	125	203	2,69
Attractiveness (AT)	64	110	174	2,86
Accessibility & Effectiveness (AE)	27	49	76	2,49
Σ	303	517	820	54,67

These results show that the instructional video generally helped students understand the material, with the highest mean score (2.86) found in the attractiveness (AT) aspect, which was categorized as “good”. The aspects of video objectives (VO), material clarity (MC), and video quality (VQ) were also categorized as “good”, show that the learning content was generally clear, relevant, and supportive of the learning process. However, content delivery and visual presentation were not optimal, particularly in terms of accessibility and effectiveness (AE), which obtained the lowest mean score (2.49) and was categorized as “fair”. The difficulty that some students still experienced in following the construction stages were caused by limited explanations during the process of ironing the M33 interfacing material and folding the welt piece inward. Therefore, revisions were made by adding supporting text to improve

narration clarity so that each step became easier to follow. Lowering the background music volume was also considered important, so students could focus more on watching the video. These improvements helped students understand the sewing procedures more consistently across different levels of ability.



Figure 1. Instructional Video and Welt Pocket Sewing Through Youtube

In the Disseminate stage, the final set of this study used YouTube as a digital viewing platform for a wider trial. A total of 38 respondents (two levels of students) involved in the trial were able to access the material through their respective mobile phones. The wider trial reached an average score of 70.18, categorized as “Very Good”. Positive perceptions of the revised narration, supporting text, and easier access to YouTube videos helped students follow the instructional content more consistently, as presented in Table 2.

Table 2. Results of the Wider Trial Response

Assessment Aspect	Respondents		Σ	$\bar{x}$
	Smt 3	Smt 5		
Video Objectives (VO)	304	93	397	3,49
Material Clarity (MC)	614	190	804	3,53
Video Quality (VQ)	515	155	670	3,5
Attractiveness (AT)	401	122	523	3,6
Accessibility & Effectiveness (AE)	212	61	273	3,45
Σ	2.046	621	2.667	70,18

The results of the wider trial show that all assessed aspects fall within the “very good” category. The highest mean score was obtained in the attractiveness (AT) aspect (3.60), show that the video was highly engaging and appealing to students. This was followed by material clarity (MC) (3.53) and video quality (VQ) (3.50), suggesting that the content was clearly presented and technically well delivered. The video objectives (VO) aspect also showed a strong result (3.49), show that the learning goals were clearly communicated. Meanwhile, accessibility and effectiveness (AE) obtained a mean score of 3.45, which, although slightly lower than other aspects, still falls within the “very good” category, show that the video was generally easy to access and strengthen the learning process. Overall, the recording media via digital encourages student’s learning outcomes in men’s apparel courses for Fashion Education. Furthermore, its distribution through YouTube platform allows students to access the material anytime and anywhere, supporting independent practice and repeated learning. This flexibility enables students to better understand each stage of the sewing process and strengthen their skills, particularly in tasks that require precision and attention to detail.

Discussion



The main challenge for Fashion Design students in constructing welt pockets lies in the high accuracy of synchronizing parang batik motifs. Cutting inaccuracies and poor fine motor control often lead to visual distortions in the form of asymmetrical diagonal patterns or bulging pockets [24]. During classroom practice, some students increasingly engage with YouTube replays of sewing, particularly clips of pocket notching. This repeated observation helps students navigate difficult techniques more independently [19]. In line with Fyfield et al. [21], that integration of visual-auditory elements in digital learning can demystify technical steps that are difficult to understand only through classroom demonstrations.

The quality of recording media is influenced by a content draft and a consistent presentation of sewing pocket. Step-by-step views and close-up scenes on important tricks helped students observe the process more clearly, especially aligning two parts of parang batik [26]. Camera angles also played an important role in showing hand movements during pocket notching, rotating the thread stick size, and folding the inner pocket without visual obstruction [27]. So, the footage made the sewing techniques easier to replicate during practice. Supplementary text and clearer audio also helped students understand the instructions for sewing patterned fabric better [28]. Previous findings [26], also describe that supporting text can strengthen understanding when audio quality is less optimal. In line with Thompson et al. [22], explain that visual and auditory media can improve practical skill learning compared to conventional methods. Students could follow each sewing stage more accurately through this structured presentation and reduce sewing errors during practice.

Parang batik motifs were used in men's apparel course because they require sewing skill growth while also introducing Indonesian cultural elements [29]. The motif is characterized by a 45° diagonal repeat pattern that is very challenging for students when aligning motifs during sewing [2], [30]. Students need to pay close attention to the placement of the paper pattern on the fabric to maintain a balanced diagonal alignment between the garment body and the welt pocket. Before cutting, marking the fabric using chalk is an important step to guide the rhythmic cutting lines of the motif. The chalk markings also help students maintain standard pocket sizes, because small misalignments impact the overall quality of the garment, in line with accurate measurements findings [31]. Aligning the motif using safety pins helps prevent shifting during sewing. Finally, maintaining consistent straight stitches is crucial for the results to not shift, so that dimensional accuracy and visual continuity can be preserved throughout the manufacturing process [10]. Thus, the standard grade A garment construction depends on various detailed aspects that become a domino effect when working with patterned fabrics.

Common defects during student sewing pocket experienced include folded fabric, uneven stitching, stretched fabric, and holes caused by inaccurate cutting. Incorrect machine settings and human error also caused the motif to shift due to improper fabric placement under the sewing machine foot [32]. These difficulties demonstrate that mastering sewing skills requires strong visual-sensory control to preserve aesthetic quality during the folding and sewing processes. Students also encountered difficulties when adding interlining, which became a double-edged element during the construction process. Although the additional layer strengthened the pocket structure, it also increased the risk of re-sewing. Even slight deviations of a few millimeters caused the parang motif to appear asymmetrical and visually inconsistent. Therefore, working with parang batik requires careful control during the cutting, interlining, folding, and sewing processes to manage garment quality.

Once assembling welt pockets using parang batik fabric, the use of M33 interfacing braced handled stabilize the diagonal parang that were prone to shifting. M33 interfacing held the welt opening in a straight position during folding and pressing without creating excessive wrinkles. Distortion during stitching also reduced the risk of defects, especially when the fabric was manipulated around the pocket frame area. The pocket structure appeared neat with continuous motif alignment while remaining flexible enough for garment use, thus helping protect items stored inside the pocket [24]. Previous

studies also emphasized the role of interfacing in supporting garment structure, especially in pocket openings influenced by fusible materials [33]. Interfacing also contributed to parang garment formability, stiffness, and durability. Therefore, the use of M33 interfacing was considered an appropriate material choice for instructional men's apparel learning.

This video encourage student-centered learning by providing more opportunities for repetition and independent practice of sewing procedures [20]. Conventional classroom settings often accommodate demonstrations that are limited in time and space, making it difficult for all students to observe the sewing process in detail [34]. Video instruction is more flexible in encourage lifelong learning, allowing students to review sewing techniques repeatedly and adjust their individual learning pace [35]. The YouTube platform also provided easier access for students with easy access to replay, pause, and adjust videos anytime and anywhere [25]. Digital platforms can expand access to instructional media, this is particularly relevant in vocational learning, where skill growth requires continuous observation and hands-on practice [36]. Consistent access to detailed visual guidance facilitating students to bridge the gap between classroom demonstration with independent sewing practice [37]. Thereby supporting the broaden of both technical accuracy and learner confidence in performing sewing techniques.

Despite the positive findings, there are a few limitations that affect the focus of listening and watching this video. Detailed explanations, such as pinning without basting construction were perceived as a minor obstacle for several students. Repeated practice was still needed to achieve consistent welt pocket stitching results. Even with clear visual guidance, the tutorial of sewing tricks in the learning medium is still difficult to follow without direct experience. Another limitation in line with Rehman et al. [38], where excessive on-screen text may reduce students' focus and increase cognitive load. Future improvements could focus on optimizing audio quality, visual presentation, narration, and supporting text to enhance the quality of instructional media.

CONCLUSION

The integration of instructional video into welt pocket construction demonstrates the growing role of digital learning in men's apparel course. The recording media support clearer understanding of ironing, cutting, or folding techniques to achieve better sewing skills. The use of parang batik fabric further emphasizes the importance of diagonal precision, motif continuity, and visual-sensory control during tailoring practice. Understanding the welt pocket construction video with M33 interfacing also sparks curiosity to explore sewing tricks using a variety of other materials. The instructional media is increasingly relevant with close-up visualization, replay accessibility, and structured construction stages for require detailed tutorial. Through clip by clip observation help familiarize a deeper understanding and cultivated Indonesian heritage-based appreciation. Therefore, the accessibility of YouTube media supports independent practice in vocational education without the constraints of space and time.

Despite these contributions, challenges remain in maintaining consistent motif placement and minimizing sewing distortions during men's apparel construction. The application of sewing video limited to avoiding misplacement parang batik motifs while assembling welt pocket and may not fully represent other sewing techniques or garment constructions. Future developments may explore more interactive digital approaches, including augmented reality and adaptive visual instruction, to support technical learning in Fashion Education.

REFERENCES

- [1] Y. N. Evita, A. Tihartono, and A. Prabhawati, "Pengakuan UNESCO atas Batik sebagai Warisan Budaya Tak Benda (WBTB)," *Majalah Ilmiah "DIAN ILMU,"* vol. 21, no. 2, pp. 113–128,



2022.

- [2] S. Budi, T. B. Affanti, and S. Mataram, "Applied Optical Art in the Parang Motif on Classical Javanese Batik," in *Proceedings of the 2nd International Conference on Design Industries & Creative Culture*, 2022, pp. 1–9. doi: 10.4108/eai.24-8-2021.2315273.
- [3] W. Wesnina, M. Prabawati, and M. Noerharyono, "Integrating traditional and contemporary in digital techniques : the analysis of Indonesian batik motifs evolution," *Cogent Arts Humanit.*, vol. 12, no. 1, pp. 1–22, 2025, doi: 10.1080/23311983.2025.2474845.
- [4] M. Xiao, "Innovative Applications and Market Impact of Indonesian Batik in Modern Fashion," *Stud. Art Archit.*, vol. 3, no. 2, pp. 62–66, 2024, doi: 10.56397/SAA.2024.06.13.
- [5] L. Pratiwi and A. Cahyana, "NUTMEG AS INSPIRATION FOR BATIK MOTIF IN," *Runtas J. Fesyen dan Wastra Nusantara*, vol. 2, no. 2, pp. 188–201, 2024.
- [6] M. N. Azqia, A. Wandira, D. Prastari, and L. Kusumawati, "Menggali Potensi Industri Kreatif Batik: Analisis Perkembangan dan Peluang di Daerah Istimewa Yogyakarta," *Geogr. J. Pendidik. dan Penelit. Geogr.*, vol. 5, no. 1, pp. 86–94, 2024, doi: 10.53682/gjppg.v5i1.8392.
- [7] S. Yuningsih, E. P. Hokianti, and S. Puspitasari, *Dynamics of Industrial Revolution 4.0: Digital Technology Transformation and Cultural Evolution*. 2021. doi: 10.1201/9781003193241-33.
- [8] A. R. Istiqomah and J. L. Amboro, "Perkembangan dan Karakterisasi Batik Klasik dalam Fashion Kontemporer Berbasis Budaya Visual," *ARS J. Seni Rupa dan Desain*, vol. 27, no. 3, pp. 199–204, 2024, doi: 10.24821/ars.v27i3.10010.
- [9] L. T. N. Anh and N. T. Hanh, "Research on Optimizing Sewing Processes for the Welt Pocket and Zipper of Jackets," *Int. J. Bus. Manag.*, vol. 9, no. 10, pp. 90–97, 2021, doi: 10.24940/theijbm/2021/v9/i10/bm2110-031.
- [10] H. Wang, "Rule-Free Sewing Pattern Adjustment with Precision and Efficiency," *ACMTrans*, vol. 37, no. 4, pp. 1–13, 2018, doi: 10.1145/3197517.3201320.
- [11] H. Li, F. Kong, L. Kong, and T. Chen, "Evaluating Sewing Operation Complexity and its Influence on Sewing Operation Quality," *Heliyon*, vol. 9, no. 3, pp. 1–12, 2023, doi: 10.1016/j.heliyon.2023.e13867.
- [12] G. R. Yunta, S. Setiawani, and R. M. Prihandini, "an Analysis of Gomory Cutting Plane Method Application in the Optimization of Production Profit: a Case Study of Griya Batik Notonegoro Jember," *Barekeng*, vol. 17, no. 1, pp. 53–64, 2023, doi: 10.30598/barekengvol17iss1pp0053-0064.
- [13] Mohamad Shukri Che Ya, N. Shaari, and N. Mansor, "Visual Observation of Women's Traditional Baju Kurung Pattern Grading Arrangement Layout on Existing Batik Fabric to Reduce Fabric Waste in Malaysia," *J. Creat. Ind. Sustain. Cult.*, vol. 2, pp. 66–80, 2023, doi: 10.32890/jcisc2023.2.5.
- [14] S. Mohammed and L. Kinyo, "Constructivist Theory As a Foundation for the Utilization of Digital Technology in," *Turkish Online J. Distance Educ.*, vol. 21, no. 4, pp. 90–109, 2020.
- [15] R. F. Ereje, "Learning Outcomes in Basic Sewing Through Instructional Videos," *Glob. J. Progress. Educ.*, vol. 10, no. 1, p. 49, 2020, doi: 10.46360/globus.edu.220201008.
- [16] M. Mpofu, H. Magagula, L. Manwa, and L. Manwa, "An Exploration of Teachers' Pedagogical Knowledge on Teaching Practical Skills in Fashion and Fabrics to High School Learners," *Int. J. Soc. Learn.*, vol. 3, no. 3, pp. 378–394, 2023, doi: 10.47134/ijsl.v3i3.219 An.
- [17] O. V. Afanasenko, I. V. Nizhenkovska, O. I. Holovchenko, and O. O. Glushachenko, "Technology-enhanced constructivist learning environment for pharmacy students," *Pharm. Educ.*, vol. 22, no. 1, pp. 778–787, 2022, doi: 10.46542/PE.2022.221.778787.
- [18] D. I. Inan et al., "How personal, technical, social environments affecting generation Z to utilise video-based sharing platform in learning process during crisis?," *Res. Pract. Technol. Enhanc. Learn.*, vol. 19, 2024, doi: 10.58459/rptel.2024.19003.
- [19] L. Wirth and G. Greefrath, "Working with an Instructional Video on Mathematical Modeling: Upper-Secondary Students' Perceived Advantages and Challenges," *ZDM - Math. Educ.*, vol. 56, no. 4, pp. 573–587, 2024, doi: 10.1007/s11858-024-01546-2.
- [20] B. Trilling and C. Fadel, *21st Century Skills: Learning for Life in Our Times*, 1st ed. San Francisco: Calif: John Wiley And Sons Inc, 2012.
- [21] M. Fyfield, M. Henderson, and M. Phillips, "Improving instructional video design: A systematic review," *Australas. J. Educ. Technol.*, vol. 38, no. 3, pp. 155–183, 2022, doi:



10.14742/ajet.7296.

- [22] P. Thompson, Y. Xiu, J. D. Tsotsoros, and M. A. Robertson, "The Effect of Designing and Segmenting Instructional Video," *J. Inov. Technol. Educ. Res.*, vol. 20, pp. 173–200, 2021, doi: <https://doi.org/10.28945/4756>.
- [23] T. Dove, "Facilitating Teaching and Learning with Made to Measure Fashion Design and Creation MOOC Courses," *Int. J. Inf. Educ. Technol.*, vol. 10, no. 10, pp. 792–796, 2020, doi: 10.18178/ijiet.2020.10.10.1460.
- [24] P. D. Venkatraman, K. Scott, and C. M. Liauw, "Environmentally Friendly and Sustainable Bark cloth for Garment Applications: Evaluation of Fabric Properties and Apparel Development," *Sustain. Mater. Technol.*, vol. 23, pp. 1–26, 2020, doi: 10.1016/j.susmat.2019.e00136.
- [25] S. Chun, J. Han, D. Choi, and T. Kwon, "Predicting Diversification Scores of Videos in Recommendation Network," *Expert Syst. Appl.*, vol. 238, no. PA, p. 121803, 2024, doi: <https://doi.org/10.1016/j.eswa.2023.121803>.
- [26] J. Wu et al., "Nurse Education Today Comparison of simulation-based interprofessional education and video-enhanced interprofessional education in improving the learning outcomes of medical and nursing students : A quasi-experimental study," *Nurse Educ. Today*, vol. 118, no. May, p. 105535, 2022, doi: 10.1016/j.nedt.2022.105535.
- [27] J. Huang, X. Xu, and J. Polzer, "Towards instructional collaborative robots : From video-based learning to feedback-adapted instruction," vol. 83, no. May, pp. 29–45, 2025.
- [28] F. Galatsopoulou, C. Kenterelidou, R. Kotsakis, and M. Matsiola, "Examining Students' Perceptions towards Video-Based and Video-Assisted Active Learning Scenarios in Journalism and Communication Courses," *Educ. Sci.*, vol. 12, no. 2, 2022, doi: 10.3390/educsci12020074.
- [29] Guntur, "Inovasi Desain Motif Parang: Studi Kasus Koleksi Museum Batik Danar Hadi," *Dinamika Kerajinan dan Batik: Majalah Ilmiah*, vol. 38, no. 1, pp. 29–44, 2021. doi: 10.22322/dkb.V36i1.4149.
- [30] W. Dong et al., "A Novel Fabric Alignment System for Sewing," in *TechRxiv*, 2025. doi: 10.36227/techrxiv.175691617.74372270/v1.
- [31] C. W. H. Syahirah and M. Sharipah, "Development of 'Intelligent Ruler' to Enhance Measurement Skills of Special Education Needs (Sen) Students in The Subject of Specific Vocational Skills : Basic Clothing Sewing," vol. 6, 2025.
- [32] W. Zelviana, P. Renosori, and Selamat, "Perbaikan Kualitas Produk Jilbab Motif Menggunakan Metode Failure Mode and Effect Analysis," in *Bandung Conference Series: Industrial Engineering Science*, 2023, pp. 550–558. doi: <https://doi.org/10.29313/bcsies.v3i2.8836>.
- [33] F. Elliza and W. Nelmira, "Perbandingan Hasil Jadi Kerah Selendang Menggunakan Bahan Bellini dengan Interfacing Cufner, Kain Gula dan Viselin," *J. Socia Akad.*, vol. 9, no. 2, pp. 160–167, 2024, doi: 10.63864/jsa.v9i2.278.
- [34] A. C. Asuncion et al., "Weaving Gaps in Garments Education Technology : Crafting a Skill-Based E-Toolkit Based on Taba ' s Curriculum Development Model," *Soc. Sci. Humanit. Open*, vol. 8, no. 1, pp. 1–13, 2023, doi: 10.1016/j.ssaho.2023.100656.
- [35] H. Ainjärv and K. Laas, "Applying constructivism in driving teacher education: Analysis based on transcripts of videotaped lessons," *Transp. Res. Part F Traffic Psychol. Behav.*, vol. 100, no. June 2023, pp. 346–360, 2024, doi: 10.1016/j.trf.2023.12.004.
- [36] S. Billett, *Vocational Education: Purposes, Traditions and Prospects*, vol. 53, no. 9. 2011.
- [37] Soelistyowati and H. S. Budi, "The Effect of Using Instructional Videos to Improve Bustier Pattern- Making Skills Among Fashion Design and Business Students at Ciputra University , Surabaya," *Interdiscip. Soc. Stud.*, vol. 5, no. 3, pp. 1250–1258, 2026.
- [38] A. Rehman, S. B. Belhaouari, and A. Kabir, "On the Use of Deep Learning for Video Classificatio," *Early Writings on India*, pp. 124–134, 2023, doi: <https://doi.org/10.3390/app13032007>.