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EXPLORING KAYUTANGAN'S VISUAL HERITAGE THROUGH WASTRA CREATION TO STRENGTHEN HIGHER-ORDER THINKING SKILLS KAYUTANGAN-INSPIRED WASTRA CREATION TO STRENGTHEN HIGHER-ORDER THINKING SKILLS AMONG FASHION DESIGN STUDENTS

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ABSTRACT

The Urban cultural heritage preservation faces two challenges: physical modernization and declining engagement among younger generations with the historical values embedded in the built environment. The Kayutangan Heritage Area in Malang, Indonesia, retains distinctive colonial architectural features and offers potential as a local-culture-based learning resource, yet it has not been systematically integrated into vocational education, particularly Fashion Design. This study explores the area's visual heritage and transforms selected elements into contemporary wastra motifs through project-based learning (PjBL), while examining the process's contribution to higher-order thinking skills (HOTS) among Fashion Design students at SMKN 3 Malang, particularly in analysis, evaluation, and creation. Using a descriptive qualitative approach, data were collected through visual observation, documentation, literature review, and design practice, then analyzed using the interactive model of Miles, Huberman, and Saldaña. The findings indicate that colonial building façades, architectural ornaments, historical markers, and geometric patterns can be identified, stylized, and recombined into new wastra motifs through structured visual exploration. Integrated into PjBL, this process engages students in analyzing the area's visual characteristics, evaluating alternative styles and color compositions, and producing original wastra designs. These findings suggest that urban visual heritage can support cultural preservation while providing a contextual learning medium for developing HOTS in vocational fashion education.

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INTRODUCTION

Urban cultural heritage is a collective asset that preserves traces of civilization, social identity, and aesthetic values through its physical structures and associated meanings. However, rapid urbanization and changes in urban landscapes expose historic areas to physical deterioration, land-use conversion, and the gradual loss of cultural meaning, particularly when younger generations have limited involvement in interpreting their historical significance. Therefore, cultural heritage preservation should extend beyond the physical conservation of buildings to include educational processes that connect younger generations with their urban identity through meaningful learning experiences.

The Kayutangan Heritage Area in Malang, Indonesia, represents an important part of East Java's urban history and retains distinctive colonial architectural characteristics. Its streetscape features rows of buildings with Art Deco and Indische architectural styles, architectural ornaments, historical signage, and geometric patterns on windows and fences. These visual elements offer potential sources of inspiration for local-culture-based learning, particularly in Fashion Design, where visual observation and creative interpretation are essential to the design process (Atok et al., 2025).

Fashion Design education in vocational schools faces the challenge of balancing technical and procedural competencies with higher-order cognitive skills. Anderson and Krathwohl's (2001) revision of Bloom's taxonomy identifies analyzing (C4), evaluating (C5), and creating (C6) as higher-order cognitive processes that require learners to examine information, make judgments based on established criteria, and generate original outcomes. In fashion design, these processes can be demonstrated when students critically examine visual sources, evaluate alternative design transformations, and justify their aesthetic decisions (Jansen & Möller, 2022). Nevertheless, strengthening higher-order thinking skills (HOTS) requires learning activities that go beyond procedural task completion and provide opportunities for reflection and critical decision-making (Hamzah et al., 2022).

Cultural Heritage Theory provides a foundation for understanding heritage as a socially constructed phenomenon whose significance develops through collective interpretation and changing social contexts. From this perspective, visual heritage, including building façades, architectural ornaments, and urban spatial elements, can be understood as a collection of visual expressions that can be interpreted and transformed without disregarding their historical context. Research on the integration of cultural heritage into digitalization-based continuing education highlights the importance of connecting cognitive learning processes with the appreciation of historical values (Chen et al., 2024). Meanwhile, Visual Culture Theory emphasizes the cultural and aesthetic meanings embedded in visual artifacts, while Design Transformation Theory provides a framework for translating visual references into new designs through abstraction, stylization, and recomposition; related research on locally inspired batik motifs also highlights the importance of balancing the characteristics of the original source with contemporary aesthetic requirements (Farihah et al., 2024)

Project-Based Learning (PjBL) offers a relevant pedagogical approach because it engages students in authentic learning activities involving investigation, design development, production, and presentation. Bibliometric studies of PjBL in vocational education associate this approach with active engagement, conceptual understanding, and the development of critical thinking and collaboration (Chang & Chen, 2022; Gu et al., 2022). Research on vocational creative-product learning also indicates that structured project activities and explicit design evaluation can support students' creativity and critical thinking, particularly when students participate in establishing project success criteria (Lesman et al., 2023; Usmeldi & Amini, 2022). Furthermore, formative assessment, technology-supported projects, and flexible learning arrangements have been investigated as complementary strategies for developing critical and creative thinking in project-based learning environments (Parno et al., 2022; Plailek et al., 2023; Sabitri et al., 2024)

Contextual Learning emphasizes the connection between instructional content and students' real-life experiences and environments, making it relevant to the use of urban visual heritage as a source of design inspiration. In vocational Fashion Design education, locally available visual resources can help students develop designs that are both technically appropriate and culturally meaningful. Previous studies have highlighted the importance of appropriate teaching resources for developing vocational fashion skills and of structured project guidance for supporting vocational learning (Agordah et al., 2023; Ana, A et al., 2022). The quality of collaboration during project activities also influences the learning process, reinforcing the need for a well-organized instructional design when students work together to develop creative products (Munianti & Syukri, 2021)

Previous research relevant to this study can be grouped into two main areas. The first concerns the transformation of traditional and locally inspired motifs, particularly batik, into contemporary designs, generally emphasizing creative development and cultural revitalization rather than their systematic integration into vocational learning (Farihah et al., 2024). The second examines the use of PjBL to strengthen students' HOTS and creativity in vocational education, but generally employs broader creative-product contexts rather than the visual heritage of specific urban historic areas as a source of design exploration (Lesman et al., 2023; Usmeldi & Amini, 2022). These two research areas reveal a gap in the integration of urban visual heritage, contemporary wastra creation, and the explicit development of HOTS within vocational Fashion Design education.

The novelty of this study lies in positioning the Kayutangan Heritage Area as a systematic source of visual exploration for developing contemporary wastra motifs through PjBL at SMKN 3 Malang. Unlike studies that focus primarily on motif development or the general outcomes of project-based instruction, this study connects the identification, analysis, stylization, and production of visual elements with the cognitive processes of analyzing, evaluating, and creating in the HOTS framework. This approach therefore examines not only the resulting wastra designs but also the learning processes through which urban cultural heritage can be transformed into a contextual resource for vocational education.

Accordingly, this study has four objectives: (1) to identify visual heritage elements in the Kayutangan Heritage Area that have the potential to be transformed into wastra motifs; (2) to describe the stages involved in transforming these visual elements into contemporary wastra designs; (3) to explain how the wastra creation process is implemented in Fashion Design learning at SMKN 3 Malang; and (4) to analyze the contribution of this process to students' HOTS in the domains of analyzing, evaluating, and creating. These objectives address the need to connect local cultural preservation with the development of students' design competencies and higher-order cognitive processes. The findings are expected to provide a contextual reference for incorporating urban visual heritage into vocational Fashion Design learning while supporting students' engagement with Malang's local cultural identity.

METHOD

This research uses a research and development (R&D) method by adapting the 4D Model which consists of four main stages, namely definition (Definition), design (Design), development (Development), and dissemination (Dissemination). This model was chosen because it is in line with the purpose of the research, which not only describes the process of exploring the visual heritage of the Kayutangan Region, but also produces products in the form of wastra along with learning tools that have been tested and suitable for use as a learning reference in the Fashion Skills Program of SMKN 3 Malang City.

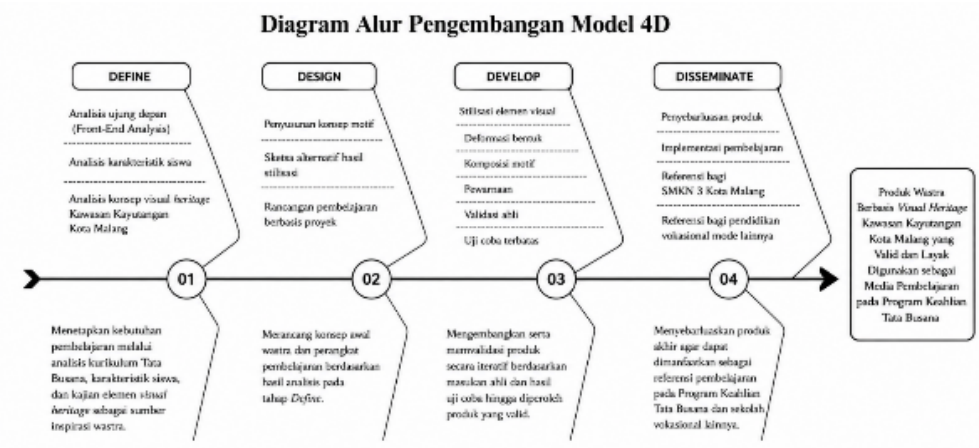


Figure 1. 4D Model Development Flow Diagram
Source: Researcher (2026)

The research was conducted in two interrelated locations, namely the Kayutangan Heritage Area in Malang City as a visual data source center at the Definition and Design stage, and SMKN 3 Malang City as a center for product testing and implementation at the *Development* and Dissemination stage. The research subjects included students of the Fashion Design Expertise Program (Fashion Dress) who were involved in the process of developing and testing wastra, accompanied by teachers who taught related subjects as well as validators of material experts and design experts. Data was collected through four techniques spread across four stages of the 4D Model. Visual observation was carried out in the Define stage to identify building façade elements, architectural ornaments, historical signs, and geometric patterns of the Kayutangan Area that have the potential to be changed. Documentation in the form of photography of visual elements in the area as well as documentation of the process and product development results was carried out on an ongoing basis in the Design to Develop stage. Literature studies on cultural heritage, visual culture, design transformation, Higher Level Thinking Skills, and the Fashion curriculum were used to strengthen the foundation of the Define and Design stages. Design making practices involving participatory observation of the stages of student work were carried out at the Development stage until before Disseminate.

The target population consisted of students enrolled in the Fashion Design and Production program at SMKN 3 Malang, particularly those undertaking coursework related to textile design, motif development, and fashion product creation. The study also involved teachers responsible for relevant subjects and experts in cultural heritage, textile design, instructional design, and learning assessment. A purposive sampling technique was used to select participants for the needs analysis and expert validation based on their relevant knowledge, professional experience, and involvement in fashion education. Approximately 6–10 students and one to two subject teachers were proposed for the initial needs analysis. The product validation process involved three to five experts, with four experts recommended to assess cultural accuracy, textile design quality, instructional suitability, and the alignment of assessment instruments with higher-order thinking skills (HOTS). Product development and evaluation followed the four stages of the 4D model: Define, Design, Develop, and Disseminate. During the Define stage, visual observations and documentary analysis were conducted in the Kayutangan Heritage Area to identify architectural features, ornaments, geometric patterns, and other visual elements suitable for transformation into wastra designs. The Design stage involved the development of initial textile designs and accompanying learning materials, including instructional guidelines, student worksheets, and assessment rubrics.

During the Develop stage, the initial product was evaluated by experts using structured validation instruments and open-ended feedback. Revisions were made based on the experts' assessments before a limited trial involving approximately 6–10 students. This preliminary trial

examined the clarity of instructions, usability of the learning materials, feasibility of the design process, and potential technical difficulties. Following the revision of the prototype, a field trial involving approximately 30–36 students from a relevant class was proposed to examine implementation feasibility, student responses, the quality of the resulting wastra, and changes in HOTS performance. For the field trial, HOTS performance was assessed through authentic design tasks and an analytic rubric addressing analysis (C4), evaluation (C5), and creation (C6). Where a pretest–posttest design was implemented, changes in student performance were examined alongside observational records, product assessments, and student responses. Quantitative findings were interpreted in conjunction with qualitative evidence to provide a more comprehensive account of product feasibility and its potential contribution to higher-order thinking. The Disseminate stage involved final product refinement, preparation of implementation guidelines, and dissemination to relevant teachers and educational stakeholders. The findings from expert validation, limited trials, and field testing informed the final revisions. Product feasibility and educational potential were therefore evaluated through complementary evidence rather than inferred solely from the quality of the finished textile designs.

The qualitative data collected was analyzed by adapting Miles and Huberman's interactive models, including data condensation, data presentation, and conclusion extraction and verification, which were carried out cyclically at each stage of the 4D Model to ensure the resulting product was valid and usable. The validity of the product and data was strengthened through source triangulation and expert validation, i.e. comparing the results of visual observations, documentation, and student work with relevant literature reviews and input from material and design experts before the product was disseminated at the Dissemination stage.

RESULTS AND DISCUSSION

Result

Visual Character of the Kayutangan Region

Visual observations carried out systematically along the Kayutangan corridor found that the visual character of this area was not formed from a single element, but from the interaction of six layers of visual components that reinforce each other, namely the façade of colonial buildings, decorative ornaments, the shape of windows and doors, ventilation, Nameplate historical and repetitive geometric patterns. The façade of the building, as the most visually dominant layer, shows symmetrical proportions with the stylish large-sized window openings indis-art deco which blended the needs of tropical climates indicated by the form of cross ventilation and sun shade as well as the fusion of European aesthetics of the early 20th century.

The decorative ornaments found at the level of the façade show a tendency to repetition and symmetry. Nameplate Historically, although physically appearing as a secondary element rather than a façade, the structure retains typography on store signage that records traces of the trade practices and visual literacy of late colonial societies. The geometric patterns on the lattice windows and wrought-iron railings feature structural units of form that are structurally close to the logic of textile motifs of repetition, symmetry, and limited variation, making this category the most natural meeting point between heritage architecture and wastra design vocabulary.

The Stages of Transforming Visual Heritage Into Wastra Motifs

The findings at this stage show that the transformation of visual heritage elements into wastra motifs occurs through seven stages that are conceptually sequential but in practice iterative, namely visual observation, element selection, stylization, shape deformation, motif composition, coloring, and design finalization. The visual observation stage results in a collection of sketches and photographic documentation of heritage elements selected as the initial visual database. The element selection stage screens the collection based on the criteria of shape-readability and potential repeatability; students consistently prefer elements with clear

geometric structures, such as window lattice patterns, over elements with ornamental details that are too complex to be distilled on a small scale (Atok et al., 2025).

Field data at the stylization and deformation stages of form showed that the students who successfully maintained the visual identity of the source were not the students who did the least stylization, but rather the students who were able to identify the main distinguishing elements (Typical Feature) source elements and maintain those elements consistently even though their overall form has been drastically simplified. In the composition and coloring stages, students consistently maintain the building's original color palette of beige, dark brown, and dark green accents in the early stages of exploration, but then introduce contemporary color variations at the finalization stage after receiving input from teachers and peers regarding the visual appeal of the design.

Implementation in Fashion Design Learning

The implementation of the development of Watra Kayutangan in Fashion Design learning at SMKN 3 Malang City is carried out systematically through four stages of the 4D Model, so that the process of making wastra not only produces the final product, but is also documented as a series of learning steps that can be replicated and used as a learning reference for Fashion Planning students.

Stages Define is realized through the analysis of the needs of the Fashion Curriculum of SMKN 3 Malang City, especially learning outcomes that require the ability to design and develop fashion products based on research inspiration sources. At this stage, the analysis of the characteristics of the wastra raised was also carried out, namely the identification of colonial façade elements, ornaments, historical signs, and geometric patterns of the Kayutangan Region that have the potential to be converted into textile motifs, as well as mapping the gap between the available teaching materials and the need for contextual learning resources based on local wisdom.

Stages Design This process takes place through the initial design process of fashion concepts and wastra motifs, including the preparation of alternative sketches resulting from the stylization of visual heritage elements, the selection of the most representative repetition structure and motif composition, as well as the design of a project-based learning scheme that guides students through the exploration stages to production in a structured manner.

Stages Develop This is the product development stage, where the initial design of the wastra motif and clothing is realized, tested, and validated through a direct comparison between the original visual source and the result of its transformation. This visual comparison is presented through a combination of photos of the original documentation of the heritage elements of the Kayutangan Region with the results of digital visualization of the development of the wastra motif, as shown in the following image.



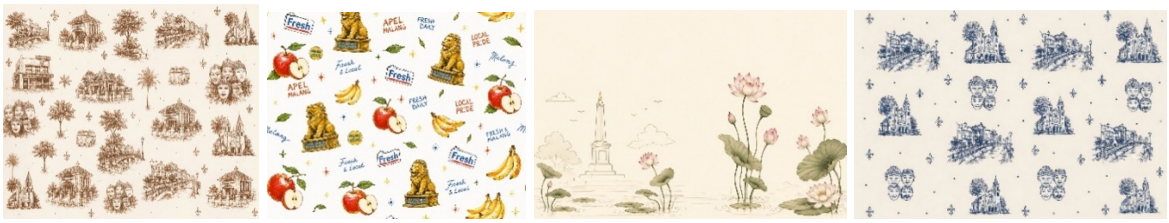


Figure 1. Original Photo of The Visual Heritage Elements of The Kayutangan Area
Source: Researcher (2026)



Figure 2. AI Visualization Results from The Development of Wastra Motifs
Source: Researcher (2026)

Discussion

The findings regarding the six layers of the visual components of Kayutangan are not only architectural facts, but traces of cultural negotiations, in which the buildings are the result of the adaptation of colonial style to the local context, so that each façade element contains a narrative of the meeting of two different aesthetic value systems. Cultural Heritage Theory emphasizing that the value of cultural heritage is not attached to the materiality of objects, but rather is built through a process of collective meaning that is constantly updated by the community of speakers (Chen et al., 2024); With this framework, the façade, ornaments, and nameplates of Kayutangan cannot be treated as a neutral visual background, but rather as a cultural text that keeps traces of the collective identity of Malang City as a colonial-commercial city that later turns into an educational and creative city. Visual Culture Theory Reinforcing this reading by emphasizing that urban visual elements are artifacts full of ideological and aesthetic content, so their reading demands contextual sensitivity, not just a formal appreciation of form. When read through the same lens, decorative ornaments featuring repetition and symmetry can be interpreted as markers of the social status of building owners in their time as well as an affirmation of the visual hierarchy of the city's main streets (Sakina et al., 2025).

The pattern of element selection by students, which consistently results in explicit geometric structures, can be explained through Design Transformation Theory, which confirms that the success of visual transformation is highly dependent on the designer's ability to recognize formal structures that can survive the process of abstraction without losing relevance to the original source. Elements with explicit geometric structures are inherently more "abstraction-resistant" than elements with complex organic details or ornamentation, as the units of form already have a logic of repetition that can be directly adapted into textile motifs.

Similarly, the student's ability to retain distinctive characteristics of the original elements despite drastic simplification of form is in accordance with the principles of the Creative Design Process and Design Thinking. These approaches place iteration between divergence (extensive exploration of alternative forms) and convergence (filtering back to essential elements) at the core of the productive creative process. The integrative framework of creativity in textile printing design asserts that an effective creative process demands an explicit balance between the components of the creator, the creation process, and the audience receiving the work. Therefore, the stylization decision cannot be separated from consideration of how the motif will be read by the final observer (Mandour, 2025).

The pattern of color negotiation from the original palette to contemporary variations also suggests that the process of transformation is not a linear path from the source to the final product, but rather a dialogical process that involves repeated negotiations between fidelity to the source and the aesthetic demands of the market or personal preference. These findings lend an important nuance to the common claim in the literature that local-culture-based learning automatically drives students' appreciation of cultural heritage, since such appreciation grows gradually through a process of trial and revision that demands active cognitive engagement rather than mere passive visual exposure (Larasati et al., 2025).

The findings regarding the pattern of element selection are in line with arguments in the study of motif transformation based on local wisdom which suggests that the successful adaptation of visual sources into textile design is largely determined by the extent to which the formal structure of the source not only decorative details can be explicitly identified from the initial stage, and involves a multi-level stylization stage so that fidelity to the source structure is maintained despite significant simplification (Farihah et al., 2024). In previous studies, the sources of inspiration used generally came from non-architectural traditional cultural artifacts such as weaving motifs or wood carvings; this study expands the scope by showing that urban colonial architecture, which is conventionally more often framed as purely physical conservation objects, also has a formal structure equivalent to traditional textile inspiration.

In the realm of HOTS reinforcement, the evaluation stage (C5) identified in the selection process of alternative styles and color compositions is consistent with the finding that teachers' assessments of students' high-level thinking skills are strongly influenced by the extent to which learning tasks explicitly require students to make decisions based on criteria, rather than simply reproducing procedures (Jansen & Möller, 2022), and strengthened by the application of continuous formative assessment throughout the PjBL process (Parno et al., 2022). The creative ability (C6) manifested at the final design production stage is also in line with the finding that culture-based creative projects simultaneously increase the creativity and critical thinking skills of vocational students (Sabitri et al., 2024; Usmeldi & Amini, 2022) and affirming the relevance of urban visual heritage as a medium of cultural preservation that suits the needs of the younger generation (Chen et al., 2024).

The novelty of this research lies in the explicit mapping between the seven stages of transformation of visual heritage into motifs of observation, selection, stylization, deformation, composition, coloring, and finalization with the three highest cognitive levels of Anderson and Krathwohl's (2001) taxonomy, namely analyzing, evaluating, and creating. This mapping offers an operational model that clarifies how the strategy Project-Based Learning Visual heritage-based exploration can be designed in a measurable manner to guide students through high-level cognitive levels sequentially, a contribution that has not been extensively explicitly explained in previous PjBL and HOTS studies that tend to use generic material contexts (Lesman et al., 2023; Usmeldi & Amini, 2022). Another implication of these findings is that urban heritage areas can be positioned as visual laboratories that are equivalent, even in some ways richer, than the commonly used traditional textile sources of inspiration, as they present a variety of visual elements (facades, ornaments, ventilation, signage, geometric patterns) in a single space that can be directly observed by students, thus expanding the repertoire of local culture-based learning resources in fashion design education.

The theoretical implication of the visual transformation stage mapping model with the cognitive level of HOTS is the need for a Fashion Design curriculum to explicitly design checkpoints Reflective at each stage of transformation is not only on the final result so that the negotiation process between historical fidelity and aesthetic innovation can take place consciously and directionally, not just intuitively. In practical terms, these findings confirm that the process of field visual observation requires students not only to photograph objects, but also to read the meanings behind existing forms, so teachers need to guide students through explicit trigger questions that demand analysis, evaluation, and criteria-based decisions at each stage of

the project (Meritasari, 2025). More broadly, the creation of wastra based on the exploration of urban visual heritage has been shown to function both as an object of cultural preservation as well as a medium to strengthen higher-level thinking competencies in vocational education in the field of fashion, so that this strategy has the potential to be adapted to other heritage areas with similar visual characteristics.

CONCLUSION

This study concludes that the Heritage Wood Area in Malang City stores rich visual elements, including colonial facades, architectural ornaments, historical signs, decorative elements, and geometric patterns, which can be systematically identified and transformed into contemporary wastra motifs through the stages of visual exploration, stylization, design development, color composition, and production. The application of this process in Fashion Design learning at SMKN 3 Malang City through the Project-Based Learning scheme has been proven to actively engage students in a series of high-level cognitive activities that are stratified, ranging from analyzing the visual character of the area, evaluating design alternatives, to producing original wastra works. Thus, the creation of wastra based on urban visual heritage has been proven to function as a pedagogical strategy that unites the goals of cultural preservation and the strengthening of the Higher Order Thinking Skills of vocational education students.

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