

Students' Creative Process In Making Wayang Golek From Reused Materials: Negotiating Culture And Material

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Abstract

This study examines how students negotiate cultural references and material constraints while making wayang golek from reused materials. A qualitative case study was conducted with 32 Grade IX B students at SMP Negeri 17 Semarang. Data were generated through participant observation across three learning sessions, semi-structured interviews with one Arts and Culture teacher and six purposively selected students, and visual documentation of the process and completed works. The data were analyzed using the interactive model of Miles, Huberman, and Saldaña through data condensation, display, and conclusion drawing and verification. The findings show that students' creative process was recursive rather than linear. Ideas changed after



materials were tested; structural and movement problems prompted technical revisions; and decisions emerged through discussion within groups. The teacher provided technical scaffolding without taking over students' artistic choices. Reused materials therefore function not merely as inexpensive media, but as design constraints that encourage students to reconsider the value and possibilities of discarded objects. The study shows that art learning can bring cultural interpretation, collaboration, material experimentation, and sustainability into a single creative experience.

Keywords: creative process; arts education; puppet show; cultural heritage; sustainability.

INTRODUCTION

Art lessons in schools are not solely judged by students' ability to produce neat or model-like work. Their educational value emerges when students must select ideas, explore material possibilities, modify plans, overcome technical failures, and explain the rationale behind their visual decisions. In this sense, the creative process is a space for reflection. Students confront problems that do not always have a single answer and are required to find solutions that remain artistically plausible. Creativity is therefore more accurately understood as the ability to generate ideas or actions that possess elements of novelty while also being appropriate to the context and goals at hand (Runco & Jaeger, 2012).

This need intersects with the new direction of arts education, which positions culture not merely as a body of knowledge but as a source of learning experiences. The UNESCO Framework for Culture and Arts Education emphasizes the importance of a stronger relationship between culture and education to develop creativity, cultural understanding, diversity, and students' capacity to address contemporary issues (UNESCO, 2024). For school learning, the consequences are clear: cultural heritage becomes more meaningful when it is not only recognized through definitions and history, but also re-developed through the experience of creating, interpreting, and engaging in dialogue within the context of students' lives.

Wayang golek provides an interesting platform for this purpose. As a legacy of Indonesian performing arts deeply rooted in Sundanese tradition, wayang golek embodies visual forms, character traits, movement systems, stories, and social values that can be learned from many perspectives. Previous research has primarily positioned wayang golek as a source of learning



sociocultural values, a medium for character development, strengthening tolerance, or introducing culture (Saripudin et al., 2014; Halimah et al., 2020; Harjianto et al., 2021; Falah & Nurjanah, 2023). These findings demonstrate the pedagogical power of wayang, but attention to what happens when students directly create and interpret wayang forms remains relatively limited.

The problem becomes more complex when the artwork is not made from conventional raw materials, but rather from recycled materials. Plastic bottles, cardboard, paper, scraps of fabric, chopsticks, and various objects that previously served other purposes do not appear as neutral materials. Each carries dimensions, textures, strengths, connections, and limitations that students must discern. In such practices, the material is not simply a medium for realizing a finished idea; its characteristics also influence the direction of the idea. Research by Çebi (2025) and Budumlu Ildes (2025) shows that utilizing waste in art education can open up spaces for expression, experimentation, and environmental awareness. In the Indonesian context, Pratiwi et al. (2025) also demonstrate that recycled materials can spark visual creativity through exploration of form and composition.

However, using used goods does not automatically constitute sustainable education. Education for Sustainable Development (ESD) positions sustainability as a process of building knowledge, skills, values, attitudes, and the capacity to act on issues, not simply introducing environmentally friendly slogans (UNESCO, 2020). This means that the act of reusing plastic bottles only has educational significance when students experience changes in how they view objects, consider their utility, make more responsible decisions, or connect material choices with environmental issues. Arts education has an advantage because this process can be presented through concrete experiences, not just verbal explanations. Jeon (2024) shows that arts learning designed within an ESD framework can connect problem awareness, creative processes, collaboration, and problem-solving efforts.

This study did not use the Torrance Tests of Creative Thinking (TTCT) or other psychometric instruments to generate creativity scores. Alabbasi et al. (2022) emphasized that the TTCT has its own procedures, components, and scoring system; therefore, the term creativity in this study is not treated as a test measurement outcome. Flexibility, originality, and elaboration are used to a limited extent as analytical lenses to read behaviors evident in the creative process. Flexibility is seen when students change strategies after materials or connections fail; originality is read from visual decisions that develop beyond imitation of examples; while elaboration is seen



in the development of details and refinement of form. Problem-solving and collaboration are read as part of the dynamics of the creative process, not as individual ability scores.

Previous studies have provided a strong foundation for wayang golek as a source of cultural learning and for used materials as a medium for creativity and environmental awareness. However, these two areas are often discussed separately. Little attention has been paid to the process by which students must maintain the legibility of a cultural form while adapting it to the heterogeneous nature of used materials. The research findings are summarized in Table 1.

Table 1. Position of research in relation to previous studies

Previous studies	The position of this research
Saripudin et al. (2014)	Wayang golek is discussed as a sociocultural learning resource; the process of students creating wayang objects has not been a focus.
Halimah et al. (2020); Harjianto et al. (2021)	Wayang serves as a medium for character and tolerance; creative decisions when students make wayang have not been examined.
Jeon (2024)	Art and ESD are connected through problem awareness, creativity, and collaboration; not the creation of objects of Indonesian cultural heritage.
Çebi (2025); Budumlu Ildes (2025)	Used materials open up experimentation and environmental awareness; they have not yet been combined with the interpretation of cultural objects.
Pratiwi et al. (2025)	Recycled materials spark visual creativity; the context is two-dimensional work and not cultural heritage.
Selian & Suri (2025)	Cultural heritage forms the basis of the pedagogical approach; the dimensions of reclaimed materials and sustainability have not yet been focused on.



The mapping in Table 1 shows that the novelty of this research lies not in the claim that wayang golek or used materials have never been used in learning. The novelty lies in the way the creative process is read as a negotiation between cultural references and material possibilities. Students must maintain the legibility of their work as wayang golek, while simultaneously confronting the size, strength, texture, and limitations of the materials they use. This leads to changes in plans, technical choices, role assignments, and visual decisions that are not fully predetermined.

This study aims to analyze the creative process of students in making wayang golek (puppet puppets) from recycled materials at SMP Negeri 17 Semarang. The analysis focuses on how students develop ideas, explore material possibilities, experiment with forms, solve technical problems, work collaboratively, elaborate on their work, and reflect on their creative experiences. Attention is also paid to how teachers facilitate the process and to the meaning of material reuse in the relationship between cultural education and sustainability.

RESEARCH METHODS

The research employed a qualitative approach with a case study design. This choice was based on the research objective of understanding the creative process as an experience occurring within a specific learning context, rather than testing relationships between variables or statistically generalizing findings. Case studies allow student actions, material decisions, group interactions, and teacher roles to be read as part of a series of interconnected events (Creswell & Poth, 2018). The case studied was a Grade IX B Arts and Culture lesson at SMP Negeri 17 Semarang, involving a project of making wayang golek (shadow puppets) from used materials.

The research location was chosen purposively because the observed learning brought together cultural objects, the process of creating works, and the reuse of materials in one activity. SMP Negeri 17 Semarang has two Arts and Culture teachers; one teacher who teaches class IX B was chosen as an informant because she was directly involved from the planning, implementation, mentoring, to evaluation of the project. Class IX B has 32 students and all were subjects of observation during the learning process. Six students were selected purposively for interviews, considering their role representation, involvement in the creation stages, and experience facing technical problems during group work. The teacher in charge was given the code G1, while the six students were given the codes S1-S6 to prevent personal identities from being revealed in the article.



Data collection took place over three meetings, namely August 6, 13, and 20, 2026. The first meeting was directed at cultural orientation: introduction to wayang golek, visual characteristics, group formation, character selection, and material planning. The second meeting focused on the practicalities of making, starting from preparing the basic structure, processing plastic bottles and paper, forming the head and body, designing the joints, and starting to install the fabric and moving parts. The third meeting was used for visual refinement, checking functions, presentation of results, and reflection on the group work process.

Data were collected through participant observation, semi-structured interviews, and documentation. Observations focused on changes in ideas, how students selected and combined materials, role assignments, peer support, decisions made during technical failures, and responses to teacher feedback. Interviews with G1 explored the reasons for material selection, learning objectives, forms of facilitation, and dynamics that emerged during the project. Interviews with six students were used to elicit explanations from the participants' perspectives regarding idea generation, plan changes, technical difficulties, collaboration, and their assessment of the work. Documentation in the form of process photos, results photos, learning notes, and visual recordings of changes in form were used as supporting evidence to check consistency between what the informants said and what was seen during the learning process.

Data analysis used the interactive model of Miles, Huberman, and Saldaña (2019), which includes data condensation, data presentation, and drawing and verifying conclusions. Observation notes, interview results, and documentation were first sorted into event units, then grouped into themes of cultural orientation, idea development, material exploration, experimentation, problem-solving, collaboration, teacher facilitation, elaboration, and reflection. Relationships between themes were read through thematic descriptions and process matrices. Conclusions were only sustained when supported by more than one type of data; a single quote or photograph was not used as the sole basis for establishing findings.

Flexibility, originality, and elaboration were used as interpretive categories to help label the patterns of creative behavior emerging from the data, rather than as test indicators. Due to these limitations, this study did not produce a creativity score and did not conclude that there was a quantitative increase in creativity. This approach was chosen to ensure that the reading of creativity remained grounded in events that could be traced during the creative process: changes in strategy, the emergence of visual alternatives, the development of details, and how students responded to problems.



The credibility of the findings was strengthened through triangulation of sources, techniques, and time. G1's account was compared with students' experiences; interview results were cross-checked with observation notes and documentation; and behavioral patterns were compared across three different learning stages. The Grade IX B teacher was also involved as a mentor teacher in the writing team. Due to this dual role, her account was not used as sole evidence but was always read in conjunction with student observation, documentation, and interview data. Visual documentation used in the article follows permission from the school and relevant parties, while student names are not included in the narrative or quotations.



Figure 1. Interview with the Arts and Culture teacher in charge of class IX B (G1) to explore the planning, facilitation, and dynamics of the students' creative process.

RESULTS AND DISCUSSION

Cultural orientation: from recognizing forms to constructing ideas

The creative process begins before students even touch the materials. In the first meeting, an introduction to wayang golek serves as a visual and cultural orientation: students recognize the structure of the head, body, hands, clothing, facial features, and how the puppets are moved. This stage is crucial because it establishes a reference point. Students don't start from a blank slate; they work from a cultural form that already has established visual conventions. However, orientation doesn't stop at copying examples. After gaining a basic understanding, the group selects a character and discusses how their characteristics can be translated into whatever materials they may have brought.

At this stage, cultural knowledge begins to serve as the basis for artistic decisions. Students consider which elements need to be retained to ensure the work remains legible as a wayang golek, which parts can be simplified, and which details are realistic to achieve with the available materials. This approach aligns with UNESCO (2024), which positions cultural and arts education as a space for developing creativity and cultural understanding. Culture does not simply consist of information about traditional forms, but becomes a reference point that is reworked through the act of creation.

This reading complements the findings of Saripudin et al. (2014), Halimah et al. (2020), and Harjianto et al. (2021), which primarily emphasize the function of wayang golek as a source of values or pedagogical media. In the case of class IX B, wayang golek also serves as a design issue. Students not only receive cultural messages from the objects they study but also must consider how wayang characters can be recreated using materials different from their traditional counterparts.

Used materials as a trigger for exploration and changes in plans

In the second meeting, the plans began to be tested by the properties of the actual materials. The groups used approximately 1.5-liter plastic bottles, chopsticks or wooden sticks, cardboard, string, paper or newspaper, fabric, acrylic paint, white glue, a glue gun, a cutter, and scissors. Some materials served as structure, while others were used to build volume, cover surfaces, or emphasize the visual characteristics of the figures. These choices weren't fully determined from the outset; some were only decided after the students experienced the materials firsthand.

Plastic bottles provide the clearest example of how materials both limit and open up possibilities. Their cylindrical shape makes it easy to create the basic structure, but it doesn't necessarily produce the appropriate head and body proportions. Students must add volume with paper, determine connection points, wrap surfaces, and then partially cover the structure with fabric. When one method doesn't produce a stable or neat shape, the group tries again with different combinations of materials and connection positions. The flexibility in this research is evident in the ability to shift from the initial plan to a more feasible solution.

The nature of used materials makes it difficult to predict the creative process from the outset. Paper, plastic, fabric, and wood all have different strengths and connection methods. Students learn from small, immediately visible failures: parts that come loose, surfaces that don't



seal properly, or joints that restrict movement. They then try again, reinforcing, repositioning, or simplifying the shape. The findings of Çebi (2025) and Budumlu Ildes (2025) help clarify this situation: waste is not just an alternative material, but a source of material challenges that can stimulate artistic experimentation.



Figure 2. Material exploration: fabric processing, forming puppet parts, and use of tools during the manufacturing process.

Problem solving grows through group work

The main obstacles that arise during the creation process relate to shaping the parts according to the design, the strength of the joints, the movement mechanisms, neatness, the sequence of work, and the division of labor. These difficulties don't arise as distractions outside of the learning process; they are where most of the creative decisions occur. When the puppet's arms don't move well, the joints need to be adjusted. When the head is too heavy or the fabric doesn't drape properly, the group must choose between refining the shape, changing the technique, or simplifying the details.

One student described the experience succinctly:

"At first we had difficulty assembling the puppet parts, but after discussing and asking the teacher, we were finally able to complete it together." (S1)

The undergraduate experience demonstrates that problem-solving doesn't occur in isolation. At some stages, one student holds the structure steady, another cuts or glues, while other group members check positioning and neatness. Technical knowledge moves through conversation and collaborative action. Creativity in these situations stems not only from individual ideas, but from the intersection of people, materials, and the problem being addressed.

The collaborative process also confronts students with negotiated decisions. They need to agree on a work order, determine who will handle which parts, and assess whether the preliminary results are good enough to proceed. This finding aligns with Jeon (2024), who demonstrated that art projects within a sustainability framework can build collaborative capacity through shared problem-solving. What is different in this study is that collaborative issues emerged alongside efforts to maintain the visual identity of cultural objects.



Figure 3. Assembling the structure, installing the fabric, and finishing the puppet parts are done collaboratively.

The teacher provides structure without taking over artistic decisions.

The teacher's role is most evident when students encounter a problem. The teacher provides initial explanations, demonstrations of techniques, guidance on tool use, and feedback on structure and neatness. Assistance is provided when students don't understand how to assemble parts or when the construction isn't strong enough. However, the teacher doesn't completely determine the final shape. The group still has room to choose fabrics, develop facial details, decide on material combinations, and customize the character's character.

The teacher's orientation towards the process is reflected in the following statement:

"In making wayang golek, what is important is not only the end result, but also how you work together, share tasks, and solve difficulties together." (G1)

G1's statement emphasized that project quality isn't solely determined by the final presentation. The process of assigning tasks, how the group responds to difficulties, and the ability to refine work are also part of the learning experience. Overly prescriptive facilitation risks turning the project into a reproduction exercise, while too little mentoring can lead to technical

issues stifling exploration. In the observed learning, the teacher served primarily as a buffer: assisting when needed, then leaving decisions to the group.

Students' retained decision-making space is crucial for the emergence of alternatives. Alabbasi et al. (2022) demonstrate that developing creativity in educational settings requires a clear understanding of what is valued and how creative opportunities are provided. In this case, the teacher does not generate solutions for the students. Instead, the teacher helps untangle technical issues so that students can return to making decisions and continue the process on their own.



Figure 4. Teacher assistance during the assembly and refinement stage; technical assistance is provided when students encounter obstacles.

Elaboration: from basic structure to the visual identity of the work

In the final stage, students' attention shifts from basic construction issues to details. Groups recheck the strength of the joints, smooth out the fabric, clarify the face, add a head covering, adjust the colors, and ensure the movement of the stick is usable. This stage demonstrates elaboration because the idea doesn't stop once the basic form is established. Students add elements that make the character more recognizable while also refining previously rough areas.

Differences in final quality between groups remain evident. Some pieces are more refined in their joints and proportions, while others are more prominent in their facial expressions or fabric choices. It's important not to read these variations simplistically as the difference between successful and unsuccessful pieces. In process studies, the final product is a reflection of the decisions, technical skills, time, quality of collaboration, and the nature of the materials the group

encountered. Originality is therefore not only measured by the uniqueness of the final form, but also by how the group solves problems and develops details from the available resources.

This finding is similar to that of Pratiwi et al. (2025), who found that recycled materials allow for variation in form and elaboration in visual creativity. The difference is that in making wayang golek, students work with three-dimensional structures and movement functions. This means that visual decisions are constantly confronted with constructional issues. For example, details that are interesting but make a piece too heavy must be reconsidered. Creativity emerges not as unlimited freedom, but as the ability to work within the limits of the work's materials and function.



Figure 5. Detail of the head and the finished work showing the development of form, facial character, costume, and movement function.

Sustainability: from “second-hand goods” to re-reading their utility value

The sustainability aspect of this project needs to be interpreted with caution. The study didn't measure long-term changes in students' ecological behavior, so the use of recycled bottles or cardboard boxes isn't necessarily evidence of a sustainable attitude. The evidence is simpler and more concrete: students experienced firsthand how previously unused objects could still be selected, cut, connected, and given new functions as part of a project.

This experience provides students with an opportunity to re-evaluate the usefulness of materials. Plastic bottles are no longer seen simply as finished containers, but as structures that can be recycled. At this point, the practice of reuse takes on pedagogical significance: students learn through concrete material decisions, not through environmental slogans. This reading aligns

with ESD, which emphasizes the link between knowledge, action, and decision-making skills in addressing the issues at hand (UNESCO, 2020).

This dimension also prevents the activity from two reductions. First, cultural learning doesn't stop at memorizing wayang. Second, recycling doesn't stop at crafting without cultural context. When the two meet, students must maintain the legibility of the wayang form while processing materials not specifically designed for making wayang. This encounter is what shapes the unique learning experience in this case.

The creative process as a meeting point for culture, materials and sustainability

When the entire learning sequence is mapped out, the creative process appears as a back-and-forth movement, not a linear sequence from idea to product. Students can revisit designs after materials have been tested, refine joints after functional movements have been tested, or add details after the overall form is established. Cultural orientation provides direction, material characteristics provide boundaries, group interactions open up alternatives, and teacher facilitation helps students keep moving when they encounter obstacles.

The research's contribution lies in the relationship between these elements. Previous studies tended to position wayang golek as a medium for conveying values and recycled materials as a medium for creativity or environmental awareness. This research shows that when the two are brought together in a single creative task, students must continually negotiate cultural identity with the affordances of the materials. This negotiation makes the creative process more clearly observable: ideas evolve with materials, solutions emerge through collaboration, and visual decisions evolve through a series of experiments.

A summary of these relationships is presented in Table 2.

Table 2. Matrix of findings of students' creative processes

Stage	Evidence and meaning of the process
Cultural orientation	Recognize the characteristics of wayang and choose characters; Cultural references are the initial limit before creating.
Material exploration	Experimenting with bottles, paper, cloth, and wooden sticks; students read both the possibilities and limits of materials.



Experiments and problem solving	Dismantle, strengthen, replace techniques, and adjust forms when the initial design doesn't work.
Collaboration	Role sharing, assistance, and discussion create creative solutions as a result of social interaction.
Teacher facilitation	Demonstrations and feedback provide technical support without taking away student agency.
Elaboration	Improvements to facial details, costumes, joints, and movement functions develop the idea towards a more complete work.
Presentation and reflection	Students explain the process and difficulties; reflection helps them re-read the decisions they have made.
Reuse material	Used objects acquire new functions; sustainability is present through concrete material experiences.

The matrix in Table 2 shows that creativity is distributed throughout the process, not concentrated in the final product. Flexibility is most evident when strategies need to be changed; elaboration is evident when students refine and detail their work; while originality is evident in the visual decisions that develop within each group. At the same time, culture and sustainability are present through very concrete decisions: what characteristics are retained to ensure the work remains legible as wayang, what materials are still suitable for use, and how material limitations are transformed into possible forms.



Figure 6. The final result of one of the group's works and documentation after the creation process.

Pedagogical implications and limitations of the study

For arts and culture learning, these findings have three implications. First, heritage-based assignments are richer when students are given the opportunity to interpret visual elements, rather than simply copy examples. Second, used materials should be treated as part of the design problem, requiring students to understand the properties, functions, and possibilities of materials before using them. Third, assessment should prioritize documentation of the process, conceptual change, problem-solving, collaboration, and reflection, rather than solely the neatness of the final product.

The limitations of this study need to be emphasized. The case study involved one class, one school, one type of artwork, and three meetings; therefore, the findings are not intended to represent all arts learning practices. The study also did not use psychometric instruments to measure creativity and did not track long-term changes in ecological attitudes. The terms creativity and sustainability were limited to patterns that could be traced through observation, interviews, and documentation. Future research could extend the observation period, compare multiple classes or types of artwork, and combine process analysis with creativity or sustainability literacy instruments if the research objectives require measurement.

CONCLUSION

The creation of wayang golek from used materials by a class of IX B at SMP Negeri 17 Semarang demonstrates that the creative process grows from the ever-changing relationship between ideas, cultural references, materials, group interactions, and teacher facilitation. Students do not follow a straight path. They may change plans after trying materials, repair joints when the movement mechanism doesn't work, or add details after the overall form begins to take shape. Creativity is therefore more evident in the way students make decisions, adapt strategies, and solve problems than in the visual differences of the final product alone.

Wayang golek provides cultural direction for creation, while used materials present both limitations and possibilities that demand experimentation. The encounter of the two forces students to study wayang not simply for information, nor simply for recycling. They must translate cultural characteristics through the available materials. The creative process emerges precisely from the effort to maintain legibility of form while adapting technique to the properties of the material.



The teacher's role is to ensure that technical issues do not stifle exploration. Demonstrations and feedback are provided when students need assistance, but artistic decisions remain with the group. This pattern allows for flexibility, elaboration, problem-solving, collaboration, and reflection. Pedagogically, the research findings reinforce the importance of arts learning that treats culture as a source of creation, materials as part of design issues, and sustainability as an experience lived through action.

Teachers can develop similar projects by expanding the selection of cultural objects, providing more open design space, and requiring students to keep a track of how ideas evolve from start to finish. Schools can support this by safely and appropriately managing used materials as learning resources. Further research should extend the observation period and involve more than one class to compare variations in creative strategies. Creativity or sustainability literacy instruments could be added if future research is directed toward quantitatively assessing change.

FUTURE DIRECTIONS

Future research could expand the study of heritage-based creative processes by involving different classes, schools, and sociocultural contexts. This expanded context is important to identify whether the patterns of negotiation between cultural references, material characteristics, collaboration, and teacher facilitation found in this study also emerge in different learning environments. The cultural objects used could also be expanded beyond wayang golek so that future research could compare how the visual characteristics, techniques, and cultural values of each object influence students' creative strategies when translated through used materials.

Future research could also employ longitudinal or mixed methods designs to gain a more comprehensive understanding of the development of students' creativity and sustainability awareness. Observations over a longer period would allow researchers to more deeply explore changes in ideas, problem-solving abilities, and the development of artistic decisions. If the research objective is to measure change, qualitative data could be combined with validated creativity instruments, sustainability literacy, or process assessment rubrics. Further studies could also explore the influence of varying levels of teacher scaffolding, group work structures, and types of recycled materials on students' creative agency. With this approach, research on heritage-based arts education could not only explain the process of creating works but also



develop learning models that more systematically integrate creativity, cultural literacy, collaboration, and sustainability.

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