

An Analysis Of The Creative Process In Creating Recycled Artwork Among Fourth-Grade Elementary School Students

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ABSTRACT : This study aims to describe the creative process of fourth-grade students in producing recycled artworks from used materials based on Wallas's stages of creativity and to identify the factors influencing this process. The study employed a qualitative approach with a descriptive research design. The participants consisted of a fourth-grade teacher and 12 fourth-grade students who were purposively selected because they were directly involved in recycled art learning activities. Data were collected through observation, semi-structured interviews, and documentation and were analyzed using the interactive model of Miles, Huberman, and Saldaña, which includes data condensation, data display, and conclusion drawing and verification. Data credibility was established through source triangulation, technique triangulation, and member checking. The findings indicate that students' creative processes developed through four stages: preparation, incubation, illumination, and verification. During the preparation stage, students understood the task and explored the characteristics and potential uses of used materials. The incubation stage was characterized by the development and refinement of ideas through reflection and discussion. During the illumination stage, students transformed their ideas into creative and varied artworks, while the verification stage was demonstrated through the evaluation and refinement of the artworks based on self-reflection and teacher feedback. The creative process was influenced by internal factors, including motivation, interest, self-confidence, and perseverance, as well as external factors, including the teacher's role, peer interaction, and the use of used materials as learning media. The findings demonstrate that recycled art learning not only develops students' creativity but also strengthens critical thinking, collaboration, communication, and environmental awareness. This study provides an empirical contribution to the development of art learning oriented toward the creative process and the strengthening of 21st-century competencies in elementary education.

Keywords: Creativity, Recycled Art, Used Materials, Creative Process, Elementary School.

INTRODUCTION

Creativity is a crucial competency that needs to be developed in 21st-century education because it supports critical thinking, problem-solving, collaboration, and the generation of innovative ideas. At the elementary school level, developing creativity serves as the foundation for students to adapt to various changes and face increasingly complex life challenges. Therefore, learning needs to be directed not only toward achieving academic competencies but also toward providing learning experiences that can facilitate the development of students' creativity. These learning experiences provide space for students to explore ideas, conduct various experiments, and produce work independently through creative thinking processes (OECD, 2023;

Runco & Jaeger, 2012). The development of creativity is also closely related to students' ability to interact with their environment and other individuals. In this context, learning activities that provide opportunities for exploration, cooperation, communication, and the exchange of ideas can support the development of students' broader competencies, including social skills (Saputra, 2024).

One subject with significant potential for developing creativity is fine art. Through creative activities, students are given the opportunity to express ideas, develop their imagination, and utilize various learning resources available in their environment. Utilizing recycled materials as a learning medium is a relevant alternative because it not only trains creative skills but also fosters environmental awareness through recycling activities. In this process, students are required to recognize the characteristics of materials, determine how to utilize them, and produce works that have aesthetic and functional value. This contextual learning experience encourages students to think more creatively while building awareness of the importance of sustainable environmental management (Kalafati, Flogaiti, & Daskolia, 2025). The use of various learning resources and the ability to utilize available materials also reflect the importance of developing students' and teachers' capacity to make optimal use of available resources in the learning process. The effective use of learning resources can support more meaningful, creative, and contextual learning experiences (Juwairiyah et al., 2024).

The process of developing creativity can be explained through Wallas' theory, which divides creativity into four stages: preparation, incubation, illumination, and verification. The preparation stage is the process of understanding problems and gathering information, while incubation is the phase in which ideas are developed through reflection. Next, at the illumination stage, an idea emerges and is realized into a work, then perfected at the verification stage through evaluation and reflection. This framework provides an understanding that creativity is a process that develops gradually and is measured not only by the quality of the final product but also by the thinking experiences students have during learning. In the process, students may also interact with peers, exchange ideas, and collaborate to develop and refine their creative ideas. Such interaction is important because creativity can develop through individual exploration as well as social interaction and collaboration (Saputra, 2024).

Initial observations in the fourth grade at SD Negeri 1 Sanggona indicated that students exhibited diverse creative abilities in recycling art lessons. Some students were able to develop ideas and produce works independently, while others still required teacher guidance or discussion with peers before deciding on the form of their work. These differences indicate that each student has a different creative process, influenced by individual characteristics and the learning environment. This

condition is important to examine to better understand the process of developing student creativity. Furthermore, the learning environment and the availability of appropriate learning resources can influence students' opportunities to explore ideas, experiment with materials, and develop creative products. Therefore, learning that encourages active exploration and the use of available resources is important in supporting students' creative development (Juwairiyah et al., 2024).

Several previous studies have shown that environmentally based art learning can enhance students' creativity (Ceylan, 2022; Romero, Lille, & Patino, 2021; Kalafati et al., 2025). However, most of these studies focus more on improving creativity or the results of work after implementing a learning model. Studies that reveal how the creative process develops at each stage of students' thinking while producing recycled art, especially in elementary schools, are still relatively limited. Thus, there remains a research gap regarding the dynamics of the creative process experienced by students from the emergence of ideas to the evaluation stage of the work.

Based on this gap, this research offers novelty by analyzing students' creative processes using the Wallas creativity stages in the context of recycled art learning from used materials in elementary schools. The research not only describes the work produced by students but also reveals the stages of creative thinking and the internal and external factors that influence the process. The analysis of students' creative processes also considers the importance of interaction, collaboration, and the learning environment in supporting the development of creativity. Therefore, this research aims to describe the creative process of fourth-grade students at SD Negeri 1 Sanggona in producing recycled artworks based on the Wallas stages and to identify factors that influence the development of creativity during the learning process. The results of the research are expected to serve as a reference for teachers in designing art learning that is more oriented toward the development of creative processes while supporting the strengthening of 21st-century competencies in elementary schools.

METHODS

This study employed a qualitative approach with a descriptive research design to obtain an in-depth understanding of students' creative processes in recycled art learning using used materials. This approach was selected because it enabled the researchers to comprehensively describe the phenomena under investigation based on students' experiences, behaviors, interactions, and creative activities during the learning process.

The research was conducted at Sanggona 1 Public Elementary School, Konawe District, Konawe Regency, Southeast Sulawesi, during the even semester of the 2025/2026 academic year. The research location was purposively selected because the

school implemented art learning activities that utilized used materials as creative media. The research participants consisted of one fourth-grade teacher and 12 fourth-grade students. The students were selected purposively based on their direct involvement in the recycled artwork learning activities and their ability to provide information relevant to the research focus.

Data were collected through observation, semi-structured interviews, and documentation. Observations were conducted to examine students' learning activities and the development of their creative processes during the production of recycled artwork. Particular attention was given to the four stages of the Wallas creativity process: preparation, incubation, illumination, and verification. Interviews were conducted to obtain information regarding students' experiences, the teacher's learning strategies, and the internal and external factors influencing students' creative processes. Documentation was used as supporting data, including photographs of learning activities, students' recycled artworks, and other documents relevant to the research.

The researcher served as the primary instrument in this study, supported by observation guidelines, interview guidelines, and documentation instruments. The observation guidelines were developed based on Wallas' four stages of creativity: preparation, incubation, illumination, and verification. These guidelines were used to systematically observe the development of students' creative processes from the initial stage of identifying and understanding the task to the final stage of evaluating and refining their artwork.

Data analysis employed the interactive model proposed by Miles, Huberman, and Saldaña (2020), which consists of data condensation, data display, and conclusion drawing and verification. Data condensation involved selecting, focusing, simplifying, and organizing data obtained from observations, interviews, and documentation in accordance with the research focus. The condensed data were then presented descriptively to facilitate the identification of patterns related to the four stages of the creative process. Conclusions were subsequently drawn and continuously verified by comparing the findings obtained from different data sources and collection techniques. The analysis process was conducted continuously from the beginning of data collection until the research findings were fully interpreted in accordance with the research objectives.

The validity and credibility of the data were maintained through source triangulation, technique triangulation, and member checking. Source triangulation was conducted by comparing information obtained from the teacher and students. Technique triangulation involved comparing data obtained through observation, interviews, and documentation. Member checking was conducted to ensure that the

researchers' interpretations accurately reflected the information provided by the research participants. These procedures were implemented to strengthen the credibility and trustworthiness of the research findings.

The entire research process was conducted in accordance with ethical research principles. Informed consent was obtained from the relevant research participants, the identities of the participants were kept confidential, and all data collected were used solely for scientific and research purposes.

RESULT AND DISCUSSION

RESULT

A. Students' Creative Process in Recycled Art Learning Using Used Materials

1. Preparation Stage

The preparation stage represents the initial phase of the creative process, during which students develop an understanding of the task and identify the potential of used materials as creative media. Based on classroom observations, the teacher initiated the learning activity by explaining the objectives of the activity, outlining the stages involved in producing the artwork, and introducing various types of used materials that could be utilized in recycled art activities. The teacher also displayed simple examples of recycled artworks as stimuli to provide students with an initial understanding of the activity without directing them to reproduce a particular form of work. This introductory activity lasted approximately 10–15 minutes and served as an important foundation for students before entering the subsequent stages of the creative process.

After receiving the initial explanation, students prepared various tools and materials, including plastic bottles, cardboard, popsicle sticks, straws, glue, scissors, colored paper, and paint. Students then observed the characteristics of each material to determine the possible forms of artwork that could be created. The interview findings indicated that the teacher intentionally provided students with opportunities to explore the materials before beginning the production process so that they could develop ideas independently.

The teacher's statement reinforced the observation findings:

"Before starting, I explain the steps and show examples so that students have an idea." (G1)

This statement indicates that the examples provided by the teacher functioned as scaffolding. The examples helped students understand the procedures involved in the learning activity without restricting their ability to develop ideas independently. Thus, the examples were not intended to serve as models that students had to

imitate, but rather as stimuli that facilitated students' understanding of the work procedures before they began exploring their own creative possibilities.

The same condition was evident in the student interviews. Most students stated that they first prepared the necessary tools and materials and attempted to understand the production process before beginning to create their artwork.

"We prepare materials such as plastic bottles, cardboard, and tools before making the work." (K1)

The data analysis showed that the preparation stage was characterized by three main indicators: understanding the learning instructions, recognizing the characteristics of used materials, and developing initial readiness to generate ideas. These indicators demonstrate that the preparation process was not limited to the provision of tools and materials, but also involved the development of students' cognitive readiness before they entered the idea-development stage. Through this process, students began to connect their previous experiences with new information, thereby establishing a foundation for determining alternative forms of artwork.

These findings are consistent with Wallas' theory, which places preparation as the stage in which individuals gather information, experience, and knowledge before creative ideas emerge. The findings are also supported by Wang (2021), who stated that creativity develops when students are provided with opportunities to explore alternative solutions through problem-centered learning. Similarly, Romero et al. (2021) emphasized that design-based learning can encourage creativity through exploratory activities, direct experiences, and active student participation in the learning process. Dewi and Alam (2021) likewise stated that conceptual learning can enhance creativity by providing learning experiences that are closely connected to students' everyday lives.

Overall, the findings at the preparation stage indicate that creativity began to develop when students understood the learning objectives, explored the characteristics of used materials, and developed readiness to produce artwork. The teacher's role as a facilitator, particularly through the provision of initial guidance and appropriate stimulation, was important in creating a learning environment that encouraged the emergence of creative ideas without limiting students' freedom to explore.

2. Incubation Stage

The incubation stage represents the phase in which students process the information obtained during the preparation stage and transform it into various alternative ideas before realizing those ideas in the form of artwork. Based on the observations, students did not immediately begin creating their artwork after preparing the tools and materials. Instead, they first observed the characteristics of

the materials, discussed possible ideas with their peers, and considered different forms of artwork that could be produced. This activity lasted approximately 10 minutes and demonstrated that the creative process involved reflection and exploration before students entered the implementation stage.

During the incubation process, students demonstrated different approaches to developing their ideas. Some students were able to determine their ideas independently based on their previous experiences and imagination, whereas others required discussion with peers or guidance from the teacher to strengthen their confidence in the ideas they had developed. These differences indicate that creativity develops according to individual characteristics and is influenced by students' learning experiences and social interactions.

The teacher interviews supported these findings. The teacher explained that students were generally given opportunities to observe the materials, discuss their ideas, and consider various alternatives before determining the form of their artwork.

"Usually, students discuss first and look at the material before deciding on an idea." (G1)

This statement demonstrates that the teacher acted as a facilitator by creating space for students to develop ideas through exploration rather than providing solutions directly. This approach encouraged students to make decisions based on their own observations, discussions, and experiences.

The findings were further supported by student interviews, which revealed differences in the process of generating ideas. One student stated:

"I have an idea of my own." (K2)

Meanwhile, another student explained:

"I have my own ideas but I'm hesitant, sometimes I look at examples from teachers." (K1)

These statements illustrate that students possessed different characteristics in developing creativity. Some students demonstrated a higher level of independence, whereas others still required scaffolding to develop confidence in making creative decisions. This condition indicates that creativity develops gradually and is influenced by individual readiness and the learning environment.

The data analysis showed that the incubation stage was characterized by three main indicators: developing ideas, reflecting through discussion, and considering various alternatives before determining the form of the artwork. These indicators demonstrate that creativity develops through a dynamic cognitive process. Students did not simply generate ideas spontaneously; rather, they processed information obtained during the previous stage, compared different possibilities, and selected the most appropriate alternative to be realized as an artwork.

These findings are consistent with Wallas' theory, which explains that incubation is a reflective phase in which previously obtained information is processed to generate more mature ideas. At this stage, students' experiences, knowledge, and information begin to interact and produce various possible solutions to the task at hand.

The findings are also consistent with Wang (2021) who stated that problem-solving-based learning provides students with opportunities to develop creativity through the exploration of alternative solutions. Furthermore, Romero, Lille, and Patino (2021) explained that a learning environment that encourages collaboration, reflection, and exploration can strengthen creative thinking because students have opportunities to exchange ideas, evaluate alternatives, and refine their ideas before translating them into a product.

Overall, the incubation stage demonstrated that student creativity developed through reflective thinking supported by social interaction and teacher guidance. Observing materials, discussing ideas, considering alternatives, and consolidating ideas were important elements connecting the preparation stage with the actual realization of the artwork. Thus, the incubation process not only produced more mature ideas but also strengthened students' confidence in expressing their creativity through recycled artwork.

3. Illumination Stage

The illumination stage represents the phase in which ideas developed during the previous stages begin to be realized in the form of recycled artwork. Based on the observations, students realized their ideas through activities such as arranging, cutting, gluing, coloring, and combining various used materials according to their chosen designs. Although students used relatively similar materials, they produced artworks with different shapes, colors, designs, and functions.

These differences demonstrate that students were able to express ideas based on their imagination, experiences, and individual creativity. Throughout the creative process, the teacher provided opportunities for students to develop their ideas independently without restricting the form of the artwork. The teacher provided assistance only when students experienced difficulties in determining techniques or solving problems that emerged during the production process.

The teacher interviews reinforced these findings:

"I let students create their own work based on their own ideas, and I only help them if they have difficulties." (G1)

This statement demonstrates that the teacher acted as a facilitator who provided support throughout the creative process without dominating students' creative decisions. Such freedom allowed students to express their ideas more

confidently while simultaneously developing their decision-making and problem-solving skills.

The student interviews also demonstrated that students attempted to realize their ideas according to their imagination, although they encountered several technical difficulties. One student stated:

"I make it according to my imagination, although sometimes it's difficult to stick to the material." (K1)

Another student explained:

"Initially the idea was simple, but when I made it I added decorations to make it look better." (K2)

These statements demonstrate the dynamic nature of the creative process. Ideas that had been planned at the beginning could be modified and refined during the production process in response to the characteristics of the materials, practical experiences, technical difficulties, and new inspirations that emerged during the activity. This finding demonstrates that creativity is not only reflected in the final product but also in students' ability to develop, adapt, and modify their ideas throughout the creative process.

The data analysis showed that the illumination stage was characterized by students' ability to transform ideas into original and flexible artworks that were adapted to the characteristics of the materials used. This finding is consistent with Wallas' theory, which describes illumination as the phase in which ideas or solutions emerge and are subsequently realized in a tangible form.

The findings are also supported by Romero, Lille, and Patino (2021), who stated that design-based learning provides opportunities for students to develop creativity through the exploration and implementation of ideas. Similarly, Kalafati, Flogaiti, and Daskolia (2025) emphasized that the use of recycled materials in art learning can encourage the production of creative works while strengthening students' innovative thinking abilities. Furthermore, Sinou et al. (2025) found that sustainable design-based learning provides opportunities for students to develop creativity through collaborative activities.

Overall, the illumination stage demonstrated that student creativity developed when students were given the freedom to transform their ideas into tangible works through creative activities. Teacher support as a facilitator, combined with opportunities to experiment with used materials, provided a learning experience that encouraged students to produce diverse artworks reflecting their individual characteristics and creative potential.

4. Verification Stage

The verification stage represents the final phase of the creative process, during which students evaluate, revise, and refine their artwork. Based on observations, after completing their work, students reviewed the quality of their artwork by examining its neatness, the strength of the material composition, the combination of colors, and the suitability of the final form with their initial ideas. Some students made improvements by adding decorations, strengthening weak parts, or rearranging materials to make the artwork more attractive and durable.

This activity demonstrated that students were not merely focused on completing the task but also engaged in reflection regarding the quality of the work they had produced.

The teacher interviews reinforced these findings:

"After finishing, I ask the students to review their work. If there's anything that's not neat or needs improvement, I ask them to perfect it themselves." (G1)

This statement demonstrates that the teacher positioned evaluation as an integral part of the learning process rather than merely as an assessment of the final product. Through constructive feedback, students learned to identify weaknesses, consider alternatives for improvement, and make decisions to improve the quality of their artwork through their own reflection.

The student interviews also supported these findings. One student stated:

"I looked at the results again, then I added decorations to make it even better." (K1)

Another student explained:

"When the teacher said it was still loose, I stuck it back on so it wouldn't come off." (K2)

These statements demonstrate that students were able to accept feedback as part of the process of refining their work. They improved not only the technical aspects of their artwork but also developed reflective thinking through the evaluation of their own work. The ability to review, revise, and refine artwork indicates that the creative process continues to develop until the final stage.

The analysis showed that the verification stage was characterized by students' ability to evaluate their artwork, accept constructive feedback, and refine their work in accordance with the learning objectives. This finding is consistent with Wallas' theory, which explains that verification is the stage of testing, evaluating, and refining ideas before a final product is considered complete. Creativity does not end when an idea has been successfully realized but continues through reflection and evaluation to produce an improved product.

This finding is also supported by the OECD (2023), which emphasizes that creative thinking includes the ability to evaluate, develop, and refine ideas into valuable products. Similarly, Romero, Lille, and Patino (2021) stated that reflection and revision are essential components of design-based learning because they help students improve the quality of their work while strengthening creative thinking skills.

Overall, the verification stage demonstrated that student creativity developed through reflection, evaluation, and refinement. Constructive teacher feedback and students' willingness to improve their work were important factors in producing higher-quality artworks. These findings confirm that creativity is reflected not only in the ability to generate new ideas but also in the ability to evaluate, modify, and refine the results as part of a continuous learning process.

Table 1. Summary of Research Findings on Students' Creative Process

Aspects of the Creativity Process	Indicators	Observation Description	Data Collection Techniques
Preparation	Understanding instructions and preparing materials	Students paid attention to the teacher's explanation and prepared the required materials	Observation, Interview, Documentation
Incubation	Exploring various ideas and discussing with peers	Students reflected on ideas and discussed possible forms of artwork	Observation, Interview
Illumination	Generating creative ideas, developing ideas, and demonstrating originality	Students produced various artworks using used materials	Observation, Interview
Verification	Evaluating the artwork and correcting deficiencies	Students refined and improved their artwork with teacher guidance	Observation, Interview, Documentation

B. Factors Influencing Students' Creativity

The findings indicated that students' creativity in recycled art learning was influenced by interrelated internal and external factors. Internal factors included motivation, interest, self-confidence, and perseverance. Motivation encouraged students to participate actively in each stage of the learning process, from exploring

materials to completing their artwork. Interest in art activities made students more enthusiastic about experimenting with different techniques and developing ideas independently.

Self-confidence also played an important role because it encouraged students to express ideas, make creative choices, and modify their artwork. Furthermore, perseverance helped students remain engaged when facing technical difficulties, enabling them to continue working to improve and complete their artwork.

In addition to internal factors, the learning environment also played an important role in fostering students' creativity. The teacher acted as a facilitator by creating an open learning environment through motivation, guidance, and feedback while maintaining students' freedom to explore. Interaction with peers also enriched the creative process by allowing students to discuss ideas, exchange perspectives, and obtain new inspiration during the activity.

The use of recycled materials as learning media also provided students with a contextual learning experience. The diversity of materials encouraged students to think flexibly about how objects in their surroundings could be transformed into aesthetically pleasing and functional products. At the same time, the activity helped foster students' environmental awareness.

These findings indicate that creativity does not develop solely as a result of individual abilities but is also influenced by a learning environment that provides opportunities for exploration, collaboration, and reflection. The findings are consistent with Ceylan (2022) and Kalafati, Flogaiti, and Daskolia (2025), who emphasized that creativity develops optimally through a conducive learning environment, student-centered learning, and meaningful learning experiences. The findings are also consistent with Çebi (2025), who stated that the use of waste materials as a medium in art learning provides opportunities for students to explore creativity, develop artistic expression, and develop awareness of the importance of utilizing used materials as part of efforts to support environmental sustainability.

C. The Impact of Recycled Art Learning on Students' Creativity

The research findings demonstrated that art learning using recycled materials had a positive impact on the development of students' creativity. Through activities that transformed various used materials into artworks, students had opportunities to explore ideas, develop their imagination, and produce works that reflected their creative thinking abilities.

The learning process was not merely oriented toward the final product. Rather, it encouraged students to actively seek solutions, experiment with different alternatives, and adapt their ideas to the characteristics of the materials available. This

process provided students with meaningful opportunities to experience creativity as an active and continuous process.

In addition to developing creativity, recycled art learning also contributed to the development of critical thinking skills. Students learned to analyze the functions and characteristics of different materials, select appropriate techniques, and overcome obstacles that emerged during the production process. These activities trained students to make independent decisions based on observations and experiences obtained during the learning process.

The learning process also provided opportunities for students to develop communication and collaboration skills. Through discussions with teachers and peers, students learned to express ideas, receive suggestions, and respect differences of opinion when completing their work. These interactions enriched the learning experience and provided students with new inspiration that supported the development of creativity.

Furthermore, the use of recycled materials as a creative medium fostered environmental awareness. Students learned that materials that were no longer being used could still be transformed into useful and aesthetically pleasing products. This experience encouraged awareness of the importance of reducing waste through creative and responsible activities.

These findings are consistent with the OECD (2023), which identifies creativity as an important competency in 21st-century learning. Ceylan (2022) and Kalafati, Flogaiti, and Daskolia (2025) further explained that environmentally oriented art learning can integrate the development of creativity, critical thinking, collaboration, and environmental awareness.

D. The Role of Teachers in the Creative Process

The research findings demonstrated that teachers played a crucial role in supporting the development of students' creativity during recycled art learning. This role was evident not only in delivering learning materials but also in creating a learning environment that provided students with opportunities to explore ideas, experiment, and produce artworks according to their individual creativity.

The teacher acted as a facilitator by providing direction, motivation, and feedback throughout the learning process without restricting students' freedom to develop their ideas. During the initial stage of learning, the teacher helped students understand the objectives of the activity, introduced various types of recycled materials that could be used, and provided examples to stimulate students' ideas.

In addition to providing guidance, the teacher developed a collaborative learning environment through discussion, question-and-answer activities, and feedback on students' work. These interactions helped students reflect on their creative processes,

identify weaknesses, and refine their artwork based on the feedback received. Consequently, the evaluation process became an integral part of the learning experience that supported the development of creativity.

These findings are consistent with Romero, Lille, and Patino (2021), who stated that teachers act as facilitators who create creative learning environments through exploration, collaboration, and reflection.

Table 2. Summary of Factors, Impacts, and Teacher Roles in the Creativity Process

Aspects	Indicators	Observation Description	Data Collection Techniques
Internal Factors	Motivation, interest, self-confidence, and perseverance	Students demonstrated confidence, active participation, and creativity during the learning process	Interview
External Factors	Teacher support, learning environment, and availability of materials	Teacher support and conducive learning environment encouraged students' creativity	Interview, Documentation
Learning Impact	Generating ideas, developing ideas, and demonstrating originality	Students produced more varied artworks, developed creative thinking and self-confidence, and demonstrated greater awareness of used materials	Interview, Documentation
Teacher's Role	Evaluating artwork and correcting deficiencies	Students refined their artwork with teacher guidance and constructive feedback	Observation, Interview, Documentation

DISCUSSION

This study demonstrates that the development of students' creativity in recycled art learning occurs through four interconnected stages of creativity proposed by Wallas: preparation, incubation, illumination, and verification. Each stage illustrates a distinct but interrelated process through which students develop an understanding of the task, explore and formulate ideas, transform those ideas into tangible artworks, and subsequently evaluate and refine the results. The findings therefore demonstrate that creativity is not an instantaneous process but develops gradually through a series

of cognitive and practical experiences acquired by students during creative learning activities.

The research findings indicate that recycled art learning provides students with meaningful opportunities to engage in creative thinking through observation, material exploration, discussion, experimentation, production, and reflection. During the preparation stage, students developed an initial understanding of the task and explored the characteristics of used materials. In the incubation stage, they processed information, discussed ideas with peers, and considered various alternatives before determining the form of their artwork. The illumination stage demonstrated students' ability to transform ideas into concrete products, while the verification stage involved evaluating, revising, and refining the resulting artworks.

This process not only resulted in diverse and varied artworks but also strengthened students' ability to make decisions, solve problems, and develop ideas based on their own experiences. The findings further demonstrate that students' creativity was influenced not only by individual abilities but also by motivation, interest, self-confidence, perseverance, teacher guidance, peer interaction, and the availability of recycled materials as learning media. This indicates that creativity develops through a dynamic interaction between students' individual potential and a supportive learning environment.

The findings of this study are consistent with Wallas' (1926) explanation that creativity develops through interconnected stages of thinking, beginning with preparation and continuing through incubation, illumination, and verification. In the present study, students demonstrated the ability to process information, explore alternative possibilities, transform ideas into concrete forms, and refine their work through reflection and evaluation. These findings reinforce the view that creativity should not be assessed solely through the quality or uniqueness of the final product. Rather, the creative process through which students generate, develop, modify, and evaluate ideas is equally important.

The results of this study also support the findings of Romero, Lille, and Patino (2021), who stated that design-based learning provides opportunities for students to develop creativity through exploration, collaboration, and reflection. The present findings similarly show that students developed ideas through the exploration of used materials, discussions with peers, and experimentation during the production process. These activities enabled students to consider different possibilities, overcome technical difficulties, and modify their initial ideas according to the characteristics of the materials and the development of the artwork.

Similarly, Ceylan (2022) explained that the use of the environment as a learning resource can enhance creativity and critical thinking because students are confronted

with real-life situations that require them to identify problems and explore alternative solutions. This finding is reflected in the present study through students' efforts to identify the potential of used materials and transform them into meaningful artworks. Students were required to analyze the characteristics of different materials, determine their possible functions, and select appropriate techniques for producing their artwork.

Furthermore, the findings support Kalafati, Flogaiti, and Daskolia (2025), who emphasized that environment-based art learning not only facilitates the production of creative artworks but also promotes awareness of environmental sustainability through the utilization of recycled materials. In this study, students learned that materials that were no longer used could be transformed into aesthetically pleasing and functional products. Consequently, the learning process connected artistic creativity with environmental awareness and encouraged students to view used materials from a different perspective.

The findings also indicate that the role of the teacher is an important factor in supporting the development of students' creativity. The teacher did not function merely as a provider of instructions but also as a facilitator who provided stimulation, guidance, motivation, and constructive feedback. At the same time, the teacher maintained students' freedom to develop and modify their own ideas. This balance between guidance and autonomy enabled students to receive the support they needed while continuing to make independent creative decisions.

The interaction among students also contributed to the development of creativity. Through discussions and exchanges of ideas, students obtained new perspectives and inspiration. Although each student demonstrated different levels of independence and confidence, peer interaction and teacher support helped students develop their ideas and overcome difficulties encountered during the creative process. This finding reinforces the view that creativity can develop through individual exploration as well as social interaction and collaborative learning experiences.

The main contribution of this study lies in its analysis of students' creative processes based on Wallas' four stages within the context of recycled art learning in elementary schools. Unlike many previous studies that have focused primarily on measuring improvements in creativity or evaluating the quality of the final product, this study reveals the dynamics of students' creative thinking processes, beginning with the preparation of information and materials, continuing through the development and realization of ideas, and concluding with the evaluation and refinement of the resulting artwork.

These findings provide empirical evidence that recycled art learning has broader educational benefits. In addition to supporting the development of creativity, this

learning experience strengthens students' critical thinking, problem-solving, decision-making, communication, collaboration, self-confidence, and environmental awareness. Students learn to explore alternatives, express ideas, respond to challenges, accept feedback, and improve their work through reflection.

Therefore, recycled art learning can be considered an innovative and contextual learning strategy that supports the development of 21st-century competencies in elementary schools. Its value lies not only in the artworks produced but also in the creative thinking process experienced by students throughout the learning activities. By providing students with opportunities to explore materials, develop ideas, experiment, collaborate, and reflect, recycled art learning creates a meaningful learning environment in which creativity can develop continuously and authentically.

CONCLUSION

This study demonstrates that the creative process of fourth-grade students in recycled art learning develops through four interconnected stages of creativity proposed by Wallas: preparation, incubation, illumination, and verification. During the preparation stage, students developed an understanding of the learning objectives, identified the characteristics and potential uses of recycled materials, and began to formulate initial ideas for their artwork. The incubation stage was characterized by reflection, discussion, exploration, and consideration of various alternatives before students determined the form of the artwork they intended to produce.

The illumination stage demonstrated students' ability to transform their ideas into concrete artworks based on their individual imagination, experiences, and creative abilities. Although students worked with relatively similar used materials, they produced diverse artworks with different forms, designs, colors, and functions. In the verification stage, students evaluated, revised, and refined their work based on their own reflections and constructive feedback provided by the teacher. These findings confirm that creativity is not an instantaneous ability but a gradual and dynamic process that develops through active, reflective, and meaningful learning experiences.

The study also revealed that students' creativity was influenced by a combination of internal and external factors. Internal factors included motivation, interest, self-confidence, and perseverance, all of which encouraged students to explore ideas, overcome difficulties, and complete their artwork. External factors included the teacher's role as a facilitator, interaction with peers, the learning environment, and the use of recycled materials as learning media. The interaction between these internal and external factors created a learning environment that

encouraged students to think creatively, make independent decisions, collaborate with others, solve problems, and develop environmental awareness.

The implications of this study indicate that recycled art learning can serve as an effective and contextual learning alternative for developing students' creativity while simultaneously strengthening 21st-century competencies in elementary education. The main contribution of this study lies in providing an empirical description of the dynamics of students' creative processes based on Wallas' stages within the context of recycled art learning. Therefore, teachers are encouraged to design learning activities that provide students with sufficient space to explore, experiment, collaborate, evaluate, and reflect on their work.

Future research is recommended to involve a larger and more diverse range of participants, schools, and learning contexts in order to obtain a more comprehensive understanding of the development of students' creative processes through recycled art learning. Further studies may also explore the effectiveness of specific learning models or media in strengthening creativity and other competencies associated with 21st-century learning.

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