



## Eco-Friendly Material Education with Tie Dye Technique For Ready-to-use Interior Products at Al-Mumtaza Orphanage

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### ABSTRACT

This study examines the applicability of strategies with educational methods through the use of eco-friendly materials in tie-dye training activities. The training activity served as a way to teach kids and young people from underrepresented groups at the Al-Mumtaza Orphanage in Bandung about the different kinds of eco-friendly materials and their applications. The activity was conducted to develop artistic creativity and knowledge of environmentally safe textile dyes used in ready-to-use interior products that are tie-dyed. With implications for curiosity and a desire to learn about environmental issues, both of which are critical to design, especially interior design, positive responses are expected. The methodology used combines content analysis with a descriptive qualitative approach. The content research approach (content analysis) is one of the ways used in dynamic processes to investigate and disclose the core based on educational strategy and methods. Qualitative research has two primary goals, which are to describe and explore, also to describe and explain. This is appropriate for describing the creation process and responses that take place throughout training sessions. The findings show that hands-on learning activities promote creativity, independence, and participants' motivation to improve. The findings also show that hands-on learning is at the heart of education's social purpose.

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## 1. INTRODUCTION

Design is a scientific field that combines art, science, and technology. Education is a medium that plays a significant role in conveying information to the audience. In this study, we look at the effectiveness of teaching initiatives using ecologically friendly fabric dyes for ready-made interior products. Learning strategies and approaches influence how well students attain their learning objectives. The learning methods employed in design as a science that delivers solutions to environmental challenges are hands-on learning activities or learning by doing. Aside from being inherent in design science, learning by doing is a pragmatic learning methodology pioneered by John Dewey. It comprises two activities: problem-solving and inquiry/discovery (Kivinen & Ristelä, 2002). Both are supposed to strengthen their artistic and design skills while also learning about ecologically friendly materials as a solution to environmental challenges. Environmental issues are a worldwide problem. Handling incidents of water, soil, and air pollution is a current environmental challenge. As a result, in the context of interior design, knowledge and actions that address environmental issues are vital for learning for everyone.

Interior design is a science that builds an artificial environment (inner space) to improve human living. Interior designers want ready-made products when designing a livable space. Several researchers have identified that ready-made products are those that are most commonly eaten by society as a whole (Kharimah & Nursari, 2019). Tie dye training activities use ready-made interior goods that are adapted to the training goal, which is children and adolescents living in the Al Mumtaza orphanage. They are taught about ready-made interior products that use tie-dye processes, such as sofa cushion covers, table runners, sofa coverings, headboards, bed sheets, and curtains.

The structure of education is constantly shifting to meet the needs of the times as well as the advancements in science and technology. For this reason, education has become one of the most crucial aspects of a person's survival. Through education, a group of people can improve their knowledge, skills, and habits that have been passed down from earlier generations. According to Chapter I, Article 1 of Law No.20 of 2003 concerning the National Education System, education is a conscious and planned effort to create a learning environment and learning process in which students actively develop their potential for religious spirituality, self-control, personality, intelligence, noble character, and skills required by themselves, society, nation, and state. To get a favorable response from the children and adolescents of Al-Mumtaza orphanage as participants in the training activities, learning relates to John Dewey's three fundamental ideas: education as a requirement of life, education as growth, and education as a social purpose. These three notions are used as variables in the study to determine the instructional plan. Meanwhile, problem-solving, inquiry, and discovery activities become educational technique variables. The application of strategies to educational techniques is intended to yield a finding that emphasizes the value of learning by doing in continuing education, particularly in the science of interior design.

## 2. LITERATURE REVIEW

Indonesia's natural resource diversity encourages people to utilize them. Turning plants into environmentally safe natural dyes is one of the ways natural resources in Indonesia are processed and utilized for textiles. Natural dyes for textiles are a safe and environmentally favorable material choice (Alamsyah, 2018). The design art creation process is carried out during training activities by introducing tie-dye techniques to ready-made interior objects.

The tie-dye technique involves tying (directly or sewn) and folding the fabric before dipping it in the dye. The functioning concept is to block or seal the bound or sewn area of the fabric so that it is not exposed to the coloring material. Indigofera leaf dye powder was chosen as a natural dye. The Indigofera plant's leaves generate a blue tint.

Learning is a system that tries to aid students' learning processes. It consists of a series of events that are structured and ordered in such a manner that they influence and support students' internal learning processes (Waskita, 2009). Thus, learning encompasses all intentional efforts to establish situations that allow (enable) the achievement of learning objectives. Learning activities involve learning objectives, which include learning strategies and methodologies. Learning strategy is the process of selecting and organizing learning activities within a learning unit. Learning strategies are specifications for selecting and sequencing learning events or learning activities in a subject. Defines learning strategies as the art of employing plans to attain learning objectives, which include approaches and procedures (Naveed *et al.*, 2021). Furthermore, Several studies describe methods as a common way to convey lessons to students or practice theories that have been learned to achieve learning objectives (Ramdani *et al.*, 2023).

John Dewey (1859–1952) pioneered the method of learning by doing. He was a psychologist, philosopher, and educator who contributed to many aspects of philosophy and psychology. His work continues to influence modern philosophy and educational practice. Learning by doing is a learning style in which students must actively participate in the learning process (Christie & De Graaff, 2017). The students' interest in things they don't know is leveraged to encourage active participation in the learning process. Learning by doing refers to direct actions taken by active learners, both individually and in groups. In this situation, they practice what is taught both individually and in groups (Maslakhah, 2019).

Creativity is necessary at the thought process stage. Several studies, creativity is a skill that can be learnt; it empowers people by giving them control over their innate abilities, which may lead to tremendous teamwork, production, and profit (Atienza, 2019). Creativity can materialize in a collaborative environment and occurs when individuals have a positive interaction (Nafiati, 2017).

### 3. METHODS

The study was focused on tie-dye training events that taught people how to use environmentally friendly materials, specifically plant-based fabric dyes. Training activities are part of UK Maranatha's Community Service Activities with UNIKOM. The activity is implemented in four stages,

- (i) The introduction. At this point, the trainees learned about different types of natural fabric dyes, namely color powders generated from indigofera plant leaves, as well as examples of ready-made interior products using the tie-dye technique.
- (ii) Sewing practice stage. At this point, each student was handed a piece of cloth measuring 20x80 cm. The fabric has a visual pattern that must be sewn subsequently using the jelujur process. After the stitching stage, based on the visual pattern on the fabric is completed, participants are instructed to draw the thread as firmly as possible and lock it.
- (iii) Dyeing practice (tie-dye process). At this point, people engage in direct practice, beginning with boiling water from Indigofera plant leaf powder, which turns bluish. This procedure was concluded by drying each fabric that had been dunked in hot water. Participants also unraveled the stitching thread.

- (iv) Evaluation stage. At this point, interactive activities included reviewing the participants' work, documenting the training results, and awarding prizes to the participants who achieved the best results (Mahyuddin et al., 2016).

According to the description above, the research method chosen is a qualitative descriptive method incorporating content research tools (content analysis). Qualitative research methodologies prioritize in-depth comprehension of a topic over looking at problems for generalization research. Qualitative research has two primary goals: (i) to describe and explore, and (ii) to describe and explain.

Descriptive research, including quantitative and qualitative methodologies, seeks to characterize phenomena as they exist (Taufik et al., 2010). This is appropriate for describing the creation process and responses that take place throughout training sessions. The content research approach (content analysis) is one of the ways used in dynamic processes to investigate and disclose the core based on educational strategy and methods. Researchers employed the content analysis methodology in this study to evaluate and try to comprehend the replies of participants throughout training activities, utilizing the educational strategy and method relationship table. Educational approach variables include education as a requirement of life, education as growth, and education as a social function.

#### 4. RESULTS AND DISCUSSION

Educational strategies and methods are the two aspects that influence learning objectives. The findings from evaluating the relationship between these two aspects in Interior Design science are essential as input for updating practical courses. The study was based on tie-dye training sessions at Al-Mumtaza orphanage, which used environmentally friendly fabric dyes. The training session is a Community Service Activity between UK Maranatha and UNIKOM. It took place on October 26, 2024, and lasted from 08.00 WIB to 16.00 WIB. A break in the form of prayers and lunch was held from 12.00-13.30 WIB. The program was attended by 32 orphanage residents, including 18 males and 14 females.

The activity was implemented in four parts: (i) Introduction; (ii) Stitching practice stage; (iii) Dyeing practice stage (tie dye process); and (iv) Evaluation. At this point, interactive activities included reviewing the participants' work, documenting the training results, and awarding prizes to the participants who achieved the best results.

**Table 1.** The applicability of strategies with educational methods based on the stages of training activities.

STRATEGIES		METHODS	
Education as a Life Necessity	Variables	Problem-Solving Method	Inquiry and Discovery Method
Description by stage of training activity		Participant activity description	Participant activity description
Education as Development		Problem-Solving Method	Inquiry and Discovery Method
Description by stage of training activity		Participant activity description	Participant activity description
Education as a Social Function		Problem-Solving Method	Inquiry and Discovery Method
Description by stage of training activity		Participant activity description	Participant activity description

Each stage is detailed in depth, followed by content analysis. The stages are as follows:

- (i) Stage 1: Introduction (from 08.30 to 09.30). At this point, the trainees were provided with academic knowledge about the various varieties of natural fabric dyes, namely color powders generated from *Indigofera* plant leaves. Participants were also given examples of finished interior products manufactured with the tie-dye technique at this point. This stage concluded with the distribution of 32 sets of fabrics and sewing materials to the participants. Each participant received one training set consisting of 20x80 cm fabrics with visual patterns.
- (ii) Stage 2: Stitching practice stage (from 09.30 to 11.30). At this point, each trainee, who has been handed a piece of cloth measuring 20x80cm, starts sewing the visual pattern on their separate cloths. The *jelujur* technique is used during the stitching activity. After sewing according to the visual pattern on the fabric, participants were instructed to draw the thread as firmly as possible and lock it.
- (iii) Stage 3: Dyeing practice stage (tie dye process) (started at 11.30). At this point, participants practiced directly, beginning with boiling water made from *Indigofera* plant leaf powder, which turns azure. This cycle concluded with drying each garment that had been dipped in boiling water. Participants also opened the stitching thread. Figure 4 depicts the process of boiling a fabric that has been stitched longitudinally and tugged to create wrinkles. Previously, the participants prepared cooking water to dip the fabric in colors obtained from the leaves of the eco-friendly *Indigofera* plant. After soaking the fabric, they opened its stitches and dried it. Participants immersed the fabric in boiled water made from the leaves of the eco-friendly *Indigofera* plant. Following that, the fabric was unstitched and dried in the sun.

**Table 2.** Content analysis based on the applicability of education as a life necessity strategies with educational methods in tie dye technique training activities at the Al-Mumtaza orphanage.

STRATEGY		METHOD	
Education as a Life Necessity		Problem-Solving Method	Inquiry and Discovery Method
<p>Stages 1, 2, 3, and 4 are discussed. The first stage is introduction. At this point, the trainees were provided theoretical information about many types of natural fabric dyes, namely color powders derived from the leaves of the <i>indigofera</i> plant, as well as examples of ready-made interior products employing the tie-dye technique. Stages 2 and 3 include hands-on practice (stitching, dyeing, and drying). The fourth stage is the evaluation. At this point, interactive activities included evaluating the participants' work, documenting the training results, and awarding prizes to the best performers. All phases were eagerly followed by the participants. This fact leads to the conclusion that they require fresh creative understanding in the field of art and design.</p>		Variable	<p>The training was held between 08.00 WIB and 16.00 WIB. Between 12.00 and 13.30 WIB, there was a break for prayers and lunch. All phases were eagerly followed by the participants. Stage 1 was information sharing, thus, both strategies were not used. Levels 2 and 3 result in both ways since both levels need direct practice. The fourth stage involved an evaluation. Stage 4 activities focus more on inquiry and discovery methods. They can view the results of their previously uncompleted work directly. Those who receive the best work award make a fresh discovery about themselves.</p>

- (iv) Stage 4: Evaluation (from 14.00 to 16.00). At this stage, the interactive activities included reviewing the participants' work, documenting the training results, and awarding prizes to the participants who achieved the best results. Figure 5 depicts the participants' successful use of the tie-dye procedure. The crew determined the success rate of the tie-dye process based on the visual pattern's clarity. The best work is determined by the level of visual pattern clarity achieved after dyeing.

Based on the description above, we classified the stages of activities as variables of learning strategies. We need to understand the relationship between strategy and method to find the relationship process between the two in achieving learning objectives about the creativity of environmentally sound design art with the tie-dye technique. The content analysis based on the relationship between strategy and learning method is shown in **Tables 2, 3, and 4.**

**Table 3.** Content analysis based on the applicability of education as development strategies with educational methods in tie-dye technique training activities at the Al-Mumtaza orphanage.

STRATEGY		METHOD	
Education as Development		Problem-Solving Method	Inquiry and Discovery Method
Stages 2 dan 3	Variable	Some male participants had difficulty sewing according to the visual pattern on the offered fabric. Some trainees, particularly males, found it difficult to sew because it was their first experience. Nonetheless, they are not afraid to ask questions, pay attention to sewing examples, and practise them.	Participants who had trouble sewing were able to develop a rhythm of stitching after being shown a hands-on demonstration of how to sew for the tie-dye process, allowing them to accomplish it in the time frame specified.
The second stage is the stitching practice stage. At this step, each student was handed a 20x80cm piece of cloth. A visual pattern on the fabric must be sewn subsequently using the jelujur technique. After sewing according to the visual pattern on the fabric, participants were instructed to draw the thread as firmly as possible and lock it. Stage 2 demonstrates that sewing is a medium for both boys and girls to grow, both those who cannot yet become capable and those who can already improve.		When preparing dye solutions using natural dyes, the trainees were guided and assisted.	The trainees took turns coloring the previously sewn and pulled fabric for about 45-60 minutes. Following that, the dyed fabric is dried in the sun on its back once the stitches have been removed.
The dyeing practice step is known as stage 3. At this point, participants engaged in direct practice, beginning with boiling water made from Indigofera plant leaf powder, which generates a bluish tint. This procedure was concluded by drying each fabric that had been dunked in hot water. Participants also unraveled the stitching thread.			



**Table 4.** Content analysis based on the applicability of Education as a Social Function strategies with educational methods in tie-dye technique training activities at the Al-Mumtaza orphanage.

STRATEGY		METHOD	
Education as a Social Function		Problem-Solving Method	Inquiry and Discovery Method
Stages 1, 2, 3, and 4		Education as a social function, in the form of a sense of connection, emotional support, empowerment, and the creation of design artworks based on creative components, necessitates the use of problem-solving, inquiry, and discovery approaches.	
Mentoring occurs throughout the entire training process. Participants in this course are guided through the process of developing strong social relationships, as well as a sense of belonging and identity. The training was also provided as emotional support to the children and youth of the Al Mumtaza institution. The program is also intended to empower individuals or groups and foster artistic and design originality.	Variable		

## 5. CONCLUSION

This study examines the effectiveness of educational strategies based on the execution of tie-dye training activities with environmentally friendly materials. Design thinking is characterized by its inherent creativity. The following conclusions can be drawn from the content acquired from the relationship table of strategies with instructional methods. Hands-on practice, or learning by doing, in stages 2 and 3 revealed that when participants met challenges and then asked questions and received individualized instructions, they were more likely to overcome them and perform better in stage 2. This suggests that the Problem-Solving approach inspires creativity; the Problem-Solving method occurs first, followed by the Inquiry and Discovery method. Education as a social role focuses on problem-solving, inquiry, and discovery methods. Both strategies foster a sense of connection, emotional support, and empowerment through the creation of design artworks based on creativity, which necessitates participation. Hands-on practice is essential for studying interior design, a scientific field. Problem solving is a design activity that necessitates creativity to achieve Inquiry And Discovery.

## 6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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