



## Used paralon pipes as materials for the creation of 3-dimensional fine art

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### KEYWORDS

*Art creation*  
*Fine Art*  
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*Used pipe*

### ABSTRACT

Fine arts study program in Unesa, including the new study program (2015 batch I). At the beginning of the study, students are provided with a 3-Dimensional Basic Art course. In the next semester students are asked to choose 2 specializations, namely; art studies and art creation. Until now, the interest in the creation of 3-dimensional art is very minimal compared to the voters of the creation of 2-dimensional art, even the 2018 batch of students did not choose (0) at all. This is the researcher's consideration to find alternative materials that can be used to create 3-dimensional works of pure art with used pipes. The research objectives; (1) to know and describe the process of making 3-dimensional works of art from used pipes. (2) to visualize/realize the form of 3-dimensional fine art from used pipes. This research uses the creative method of 'Design Thinking' through exploration and experimentation of materials, shapes, sizes, techniques and construction. The research was carried out on students of the pure fine arts study program class of 2021, a total of 26 people. Data collection techniques; observation, interviews, documentation. Data validity through triangulation of sources and results / products. The results of (1) the process of making 3-dimensional works of art with used pipe materials is to find used pipe materials of various sizes, types, tools, techniques, finishing works, from various trash cans or landfills. (2) 6 works of 3dimensional fine art from used pipes of various sizes and types of used pipes can be produced.

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## 1. Introduction

The Bachelor of Fine Arts study program at the Faculty of Language and Arts, Surabaya State University (Unesa) is a new study program (batch I - 2015). At the beginning of college, all students program Basic 3-Dimensional Art as a compulsory course. In the following semester there are elective courses, art studies and art creation. The specialization of art creation has two options, namely: 2-dimensional art creation and 3-dimensional art creation. Furthermore, this research will focus on the creation of 3-dimensional artworks. Many students of fine arts study programs are not interested in the option of creating 3dimensional artworks. Based on the facts, students who choose the specialization of 3-dimensional art creation are very minimal. For example, the 2016 class of fine arts students who chose the specialization of 3-dimensional art creation only amounted to = 2 people, class of 2017 = 4 people, class of 2018 no one chose = 0 people, class of 2019 = 4 people, class of 2020 = 2 people.

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Every year the number of fine arts students who choose the specialization of 2-dimensional art creation is always more than those who choose the specialization of 3-dimensional art creation.

Based on the above facts, there needs to be an alternative solution so that students like and are eager to choose the specialization of 3-dimensional art creation, at least balanced with those who choose the specialization of 2-dimensional art creation. They assume that the creation of 3-dimensional works of art requires a lot of money, energy and more time. As if 3-dimensional artworks can only be created with wood, metal, cement, stone, clay, fiber-glass, and so on. In fact, there are many other materials around us that can be used to create 3-dimensional works of art, one of which is used pipes. These used pipes are often found around us, especially in landfills. Used paralon pipes are a type of plastic waste that is difficult to recycle. Actually, to reduce the volume of existing plastic waste, it can be done through the 3 R concept, namely; Reduce, Recycle, Reuse (Purwaningrum 2016). Reduce: are all forms of activities or behaviors that can reduce the use of plastic waste, including the type of paralon. Recycle: utilizing used goods by processing the material to be used further which may be very different from its original function. Reuse: reusing used goods without prior processing for the same or different purpose from the purpose/function of the initial material (Miftahurrohman et al. 2017).

Paralon pipes have very diverse types and functions, ranging from disposal systems, to plumbing systems or drains. The use of paralon pipes as supporting building / living materials is very high. The very high use of this pipe makes it easy for us as consumers to find used pipes in the trash. The types of existing paralon pipes are types AW, D and C. Each has a different function. Namely; (1) AW pipe is a pipe commonly used to drain water pressurized up to 10 kg per cm<sup>2</sup>. This pipe has thick walls so it is strong to withstand water pressure. In addition, AW class paralon pipes can also be used to drain water from pumps or for high-pressure clean water lines so that they can distribute water properly to all plumbing units in a building. (2) Type D paralon pipes are usually used to drain wastewater that is not pressurized, for example to drain water from the bathroom sink, from the kitchen sink, from the closet, and many other applications that do not require pressure to drain water in the pipe. Type D pipes can withstand pressures of up to 5 kg per cm<sup>2</sup>. Due to its smaller thickness and resistance, the price of this pipe is also cheaper than the AW type pipe. As mentioned above, generally this type of pipe is used as a household water drain. (3) Type C pipe is a type of pipe with the thinnest thickness. This pipe can be used as a household water drain, but is usually more often used as a protective electrical cable. The price is also cheaper than the previous two types used pipes. Of the three types of pipes mentioned above, it seems that the type D and C pipes are enough to produce 3-dimensional works of pure art. With a thinner material, it will be easier for the material to be shaped into a 3-dimensional work of fine art, especially a contemporary work of fine art. Exploration of materials that lead to artistic value, nuances of novelty, the desire to be different as a form of existence of works of art (Raharjo 2021).

Furthermore, the concept of reuse is more suitable for utilizing used plastic waste pipes of various sizes that can be used to create 3-dimensional works of pure art (Hakim 2019). With a little creativity, used pipes can be processed/created into interesting 3-dimensional art products. Starting from the spirit of learning to work in fine arts must 'have an aesthetic experience', then the form of motivating students is by doing art activities in the studio. By exploring the materials, forms, and construction of 3-dimensional artworks, it can be used as a model to encourage students in creating 3-dimensional artworks. Exemplary can be categorized as a model of attitude that has the potential to generate enthusiasm for practical college activities in the studio, especially creating 3-dimensional works of art (Isnawati and Samian 2015). Showing students to build creativity in creating 3-dimensional art with alternative media/materials, namely used pipes (Masni 2017). The impact is expected that many students will choose the specialization of creating 3-Dimensional Fine Art, which is currently very minimal. Introducing students to the fact that anything around us can be a visual material/material element to create a 3-dimensional work of art (Iasenovskaia 2021).

Three-dimensional or trimatra works of art are works of art that have dimensions of length, width, and height, or in other words have depth (volume/bulk) in addition to length and width, so that their form can be enjoyed from various directions. Works of art that belong to this group such as sculptures, buildings, dolls, and various types of product designs. Meanwhile, according to Sofyan (Salam and Muhaemin 2020) three-dimensional art is art that is plastic in shape or form. The intended plastic is that it can be seen touched and enjoyed through physical eyesight. This work of art is included in the category of art that utilizes tangible objects and is formed into new functions. In realizing there are symbols and impressions that appear in the work of art. Three-dimensional works of art when viewed from the science of measuring space (stereometry) are works of art that have space; the space itself is bounded by walls of three sizes: the size of the roof is identical to the size of the base or floor. The size of the right side and left side are associated between them, as well as the size of the front and back to show the perspective space. In addition to these measures, it can also be mentioned through the explanation of three measures: length, width and height. This volume space shows solidity (whole and full) as well as space based on construction, so that the viewer sees the space from within the space itself. This condition makes three-dimensional art a complex art of discussion. Fine art is a work of art that is created solely with the intention of fulfilling the need to express a sense of beauty (aesthetic taste), not intended to fulfill practical uses or functions. Examples of works of art that belong to this group are paintings, sculptures, tapestries, or other works of art produced by artists solely for aesthetic expression. The term fine art appeared for the first time in Europe during the Renaissance Period. The purpose of this study are; (1) What is the process of making a 3-dimensional work of art with used pipes?; (2) How are the results of 3-dimensional works of art with used pipes?

The objectives of this study are; (1) Knowing and describing the process of making 3-dimensional artworks from used pipes; (2) To visualize/create a 3-dimensional work of art using used pipes. Benefits of the research; (1) Benefits for students; this research is useful to motivate students of fine arts study programs, in creating 3-dimensional works of art with materials that are easily available; Adding to the repertoire of creating 3-dimensional works of art from used pipes; (2) Benefits for researchers; Researchers can get an overview and knowledge about alternative materials for making 3dimensional works of art from used pipes, which can be transferred to students of fine arts study programs; (3) Benefits for educational institutions; this research will be able to provide information and knowledge to students majoring in fine arts about the process of making 3-dimensional works of art from used pipes and the results of the creation of works from these materials; (4) Benefits for the community; can reduce the volume of used pipe waste in the garbage disposal area. The community has a neighborhood area with cleaner air.

## **2. Method**

Based on the above problems, the method of creating 3-dimensional fine art works with used pipes uses the creative method of 'Design Thinking' through exploration and experimentation of materials, shapes, sizes, techniques and construction. Exploration of the idea of materials to be used requires sensitivity and sensibility to the existing potential. So the flow of this practice led research method can be conveyed as follows; (1) The research subjects were 26 students of the undergraduate fine arts study program class of 2021; (2) Data Collection. Data collection was conducted from field studies. Data collection techniques are carried out through observation, interviews, documentation and literature studies (Anggito and Setiawan 2018). Observation by collecting data on the materials/materials of used pipes in the field, the size and type of pipes found in the field. Interviews were conducted with students of the fine arts study program in the class of 2021. Documentation is a photo or video of the process of creating 3-dimensional fine art works from used pipes; (3) Exploration and Experimentation (Hendriyana 2022a). Creatively designing a 3-dimensional work of art with used pipes, through a process of innovation sourced from used pipes in several stages; (1)

Collection and selection of used pipes of various sizes in landfills; (2) Determining the materials and tools needed so that the manufacturing process runs smoothly; (3) Determination of cutting and carving techniques for used pipes to be more effective and efficient; (4) Determining how to connect and combine used paralon pipe materials so that the construction is strong and sturdy. The trial of the work is related to materials, techniques, construction and aesthetics. This research is close to development research, so it is necessary to test it on students of the 2021 fine arts program. Design management and calculation of the process of creating 3-dimensional works of art using used pipes. Realizing the form of creation of 3-dimensional pure art works from tested used pipes.

### **3. Results and Discussion**

#### **3.1. The Process of Making 3-Dimensional Fine Art Works with Used Paralon Pipes**

Before creating a 3-dimensional work of fine art, it is necessary to conduct field observations and literature studies to find out the various types of materials and tools needed in the creation of 3-dimensional works of fine art with used pipes. Used pipes have advantages such as; easy to obtain, easy to install/construct, strong and anti-rust. From the data in the field there are various brands of pipes; Maspion, Power, Wavin, Sun, Trilliun, Rucika, and so on. While the types of pipes, based on the type; (1) Type AW: pipes with type AW are the strongest and thickest pipes among other pipe types. This material is able to withstand a pressure of 10 kg / cm. AW pipes are used for water lines with high pressure or those pumped with a water pump machine; (2) Type D: this pipe has a medium thickness. The material can withstand a maximum pressure of 5kg / cm. This type D pipe is often used in the manufacture of water sewers; (3) Type C: This type of pipe is the thinnest so it is not strong enough to withstand water pressure. Therefore, type C pipes are usually only used to protect electrical cables.

The size of the pipe includes the length and the hole of the pipe. Used paralon pipes come in various sizes. Generally, new pipes are 4 meters long. The diameter of the pipe holes varies, characterized by the size of the dim ("). The smallest size is ½" (dim) up to 5". If the used pipe in the rombeng place (used goods), the size of the pipe is more varied both the length and the hole, but usually already dirty and the color changes. The color of the pipe there are 2 kinds, namely white and gray. Materials required; Drawing paper, as a sketching medium (Karpenko & Hughes, 2006). Used pipe material, Paralon pipe, size 5/8 dim, ½ dim ("), 3/4", 1", 1.5", 2", 2.5", 3", Paralon pipe glue, brands Isarplas, Dextone, Revcolplas, RU Glue, Sharplas, etc, Pylox/Diton paint, especially white, gray, blue, black, brown, metallic white, golden yellow, etc, You can also use Aviant Nippe paint, Plywood, as the base for the work stand, Tools required; Pencil, ball-point, eraser, tools for sketching, small hacksaw, to cut the pipes, scrubbing paper, to smooth the surface of the pipe, mini burrs, to perforate the paralon pipe material, small drill bit, to drill holes and engrave the material. Exploration and experimentation (Hendriyana 2022a). Various types of used pipes, with various sizes and brands can be used as materials to create 3-dimensional fine art works. From various trials for the creation of 3-dimensional fine art works, it is actually sufficient to use type C or D used pipes. Type C pipes have the thinnest pipe thickness, making it easier to shape, perforate and carve. If you want a stronger one, it is enough to use a slightly thicker type D pipe. This type of pipe is usually used for artwork that demands stronger and sturdier construction. To make it cheaper and easier, used pipes can be an alternative choice to form 3-dimensional works of pure art from various shapes and sizes of pipes. However, used pipes need to be cleaned and smoothed first before making a 3-dimensional work of art. Cleaning the pipe is enough to use ordinary water and smoothing the pipe with sandpaper/scouring paper measuring 360. The use of this material with used pipes will be better when finished with Phylox paint or plastic paint.

Pipe shaping (curves, circles, etc.) can be done by heating at a certain temperature (baking) on the stove. So that the result is not flat when heated, the pipe hole needs to be filled with sand first, after the temperature cools the sand is removed from the pipe. Including if the paralon pipe is to be made into sheets, then the pipe needs to be heated first. Pipes that are made into

sheets are usually large (wide diameter), for example 4", 5", 6" pipes, etc. Pipe sheets can be done by cutting the pipe, then heated using an iron after the pipe is given a zinc base or the like. It can also be straightened by ironing on a flat and smooth ceramic surface. These sheets of pipes can be used as materials to create 3-dimensional works of fine art with various shapes and colors. The process of creating a work of pure art from this used pipe material is that the used pipe is cut into pieces with a saw as needed. Some of the pipe pieces are split into 2 parts, to create a variety of shapes so as not to be monotonous. To organize the pieces of pipe, it is necessary to glue them with Isarplas to make them strong and sturdy. Before gluing, the pipes need to be engineered and tested for shape quality so that the 3-dimensional arrangement can create an interesting and aesthetic 3-dimensional work of pure art. Finishing techniques: can retain the original gray pipe color, or can be finished with Pylox paint or Pylox clear varnish, so as not to change the original color of the pipe. Form and function: This 3-dimensional work of pure art is in a non-figurative form, which functions as a mere decoration. The work can be displayed or placed on a table and can be enjoyed from various directions.

### **3.2. Forms of 3-dimensional Fine Art Works from Used Paralon Pipes**

In this work, the process of making the work is to cut the paralon pipes then install the paralon side by side then both are glued. In the next stage, the two pipes that were glued together are arranged in a circular composition upwards (Salam and Muhaemin 2020).



**Fig 1.** Progress (A. Hufaf) Size: length x width x height = 16cm x 15cm x 22cm

The arrangement with this simple twisted composition makes the form of this work unique. Simple yet harmonious. The repetition of shapes at each level reinforces the same message, as if through this work the artist wants to emphasize the need for consistency of attitude, both at the bottom and even at the top of "power". The pattern of repetition shows the pattern of human attitude to keep moving consistently in life. This is the essence of progressive steps to be voiced.



**Fig 2.** Dynamics of Movement (Ulma Z. Fadilah) Size: length x width x height = 15cm x 18cm x 37cm

The process of making the work involves cutting the pipes and splitting or opening the pipes. Some of them are curved in such a way. Then, after being attached to each other, they were painted with the air brush technique. This composition is very interesting because it variably integrates harmoniously the circular and darting forms. Thus, the point of interest lies precisely in the diversity of forms as a whole. The divergent composition is a strong attraction. The harmony of this work is formed by the crossing of objects and shapes, giving the impression of space (Ayu 2013). This work seems to convey the message that in facing life, not only intellectual intelligence is needed, but also spiritual intelligence, which is symbolized in the flexible attitude of the shape of the paralon. While still capturing spiritual signals from the sky, this is shown in the symbolization of the shape of the parabolic wedge that points upwards.



**Fig 3.** Dialectic of Three Pillars (Galuh Erwindra) Size: length x width x height = 20cm x 15cm x 45cm

In this work, the arithmetic pattern is dominant. The focus of interest is on the three planes arranged upwards. Meanwhile, the rhythmic pattern is found in the circle placed below and propagating vertically. Thus, the composition is more transcendental and upward (Hendriyana 2022b). The meaning of this work is to convey that the three levels upwards can be interpreted as the understanding of Islam, Iman and Ihsan. The whole is directed to the Creator. The circle that accompanies the three fields is realized in the form of a circle. This is perhaps the need for a consistent attitude of repetition and rotation.



**Fig 4.** One Choice (Nidaul Hasanah) Size: length x width x height = 21cm x 27cm x 30cm

Technically, the work is done by cutting the pipes. Some are cut long and short, while others are strung together. The combination of gray and white pipes is expected to create a contrast of colors. Visually, the point of view is more directed towards those in the series of paralon boxes. The composition is more diverse. It combines symmetrical and diametrical at the same time. Although the direction of the pipes is divergent, they are centered at the bottom. The composition of the shapes is diverse. There is a rhythmic feel to the small pieces of pipe. It is also dynamic in the upward direction (Jayadi 2016). In meaning, that in life and living, we are faced with many choices. Each brings consequences to the choice. The diversity of life directions with all visions, missions and programs also brings direction and goals that are not stereotyped.



**Fig 5.** Ladder of Success (Bagus Dico) Size: length x width x height = 20cm x 25cm x 30cm

In life, all stages are processes. From childhood to adulthood and even old age. The whole is a procession or rest in undergoing each chapter. Like a literary work, it needs a prologue dialogue and epilogue. Each stage goes through a complicated dynamic, winding, climbing and even cornering. A unity that stands vertically, horizontally, twisted and circular. This work shows the dynamics referred to above. With one pile that rises up is intended as a substantial life goal. That is servitude to God the Creator. Meanwhile, there are three supporting poles. It can manifest to the support of parents, teachers and friends. The whole is a cohesive whole leading to servitude to Him. The upright, twisting composition illustrates a situation that life is a dynamic, endless dialectic. So the harmonica is what it is. There is no way it can stand on its own. It cannot be rigid in the face of life, but it must think and act flexibly (Mubarat and Ilhaq 2021). In the end, the ladder of success as referred to above, is success in treading every tread and step. In life, all stages are processes. From childhood to adulthood and even old age. The whole is a procession or rest in undergoing each chapter. Like a literary work, it needs a prologue dialogue and epilogue.



**Fig 6.** Life Journey (Y.E.Herani) Size: length x width x height = 15cm x 16cm x 40cm

Perspectively, this work has a degree of aesthetic breadth and depth. The formal analysis of the beauty value lies in the harmonious composition. This work presents a composition of pipes that are oblique, angled, to the left-right side and upright. The rhythm is more dynamic and rhythmic, especially in the small pieces of pipes. The dense and cohesive accents further show the spatiality of the work. The center of interest is the large pipe in the middle. It is as if it pulls the small pieces of pipe together in a single bond. Thus, the balance between the large pipe extending upwards and the small pieces of pipe becomes harmonious and unified in form. This seems to remind us of the pattern of human physics and metaphysics in living life. That in life, all stages are processes. From childhood to adulthood and even old age. The whole is a procession or rest in undergoing each chapter. Like a literary work, it needs a dialog prologue and epilogue. Each stage goes through a complicated dynamic, winding, climbing and even cornering (Jayadi 2016). This work shows the dynamics referred to above. With one pile that rises up is meant to be a substantial life goal. Namely, servitude to God the Creator. The whole is a coherent whole leading to servitude to Him. The upright composition, tilted to the left-right, illustrates a situation that life is a dynamic, endless dialectic. So the harmonica is what it is. There is no way it can stand on its own. It cannot be rigid in facing life, but it must think and act flexibly. In the end, the ladder of success as referred to above, is success in treading every tread and step.



#### 4. Conclusion

The process of creating a 3-dimensional work of pure art from used pipes is by preparing materials and tools, exploring arrangements and construction techniques to make it strong and sturdy. The arrangement of various sizes of used pipes in various directions is needed so that the composition of the shape is unified, rhythmic and proportional before the material is glued with glue. The final finishing technique with plastic paint/Pylox is needed if the used pipes want to appear cleaner and tidier. Three-dimensional fine art works made from used pipes, resulting in non-figurative forms. There are 6 forms of exploration of materials from used pipes that have been created with the concept of reuse; utilizing used pipes that have a completely different function from the original purpose for which they were created. In this way, it is hoped that it can slightly reduce the volume of plastic waste of the type of paralon pipes into a more comfortable green/eco-green environment

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