

Executing Clay Art and 3D Abstract Animations Developed from Scribblings to Promote Children's Creative Growth

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Abstract

This study seeks to strengthen children's creative thinking by taking inspirations from a pupil's scribblings and root of a plant with 3D animation principles and execute them in clay art as well as 3D abstract animation to promote creative thinking among children. The study adopted a studio –based research method of qualitative research design and employed the aesthetico-action research method by observing, reflecting, planning and creating the clayart with the aid of 3D abstract animation principles from a child's scribblings and the root of a plant. The study also used observation as a research instrument to produce the clay art. The final pieces of the artworks were assembled at the Art Gallery of the Centre for National Culture in Kumasi for viewing, interpretation and understanding its concept by the selected school children and art teachers. The purposive sampling technique was adopted to select twenty (20) viewers comprising five (5) visual art teachers and fifteen (15) basic school pupils who study creative art as a subject in the Kumasi Metropolitan Assembly (KMA). The views of the respondents were initially recorded, transcribed and analysed qualitatively to draw conclusions. It was revealed among others, that the clay artworks generated and developed with assistance from 3D abstract animations principles enhanced the children's cognitive abilities. Therefore, the study recommends that ceramic and graphic artists explore the possibility of developing kids' scribblings and come out with interesting designs and execute them in clay art and 3D abstract animations for aesthetic, educational, societal and children's cognitive values.

Keywords: Clay, 3D abstract animation, drawings, scribbles, and assemblage,

1.0 Introduction

The development and growth of creative thinking among children in our society depends on allowing them to express themselves in a personal manner; and there is a feeling of satisfaction for a child when praised for a good scribbling or artwork done. Children communicate in many ways and that verbal communication offers a minute insight into the child's mind. Analysing children's drawings and art activities give a deeper understanding of the child's mental and psychological states (Coates and Coates, 2010). In another development, Lowenfeld (1939) had pioneered in the identification of the stages of the development of art skills in children. He identified the following general stages as;

- I. the scribbling stage (age 2-4),
- II. pre-schematic stage (age 4-7),
- III. schematic stage (age 7-9),
- IV. gang stage (age 9-11) and
- V. stage of reasoning (age 11-13).

However, Ramaiya (2018) mentions that children draw pictures in three phases namely:

- I. Scribbling phase – random scribbling of lines that have no real meaning
- II. Pre-schema phase – when children try to draw what they see, including simple figures, trees, houses, etc.
- III. Schema phase – when there is a well-identifiable theme to the drawings and the drawings are more realistic.

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Pahl (1999) suggested that for a young child, ‘writing might even be drawing, and that as the child “draws” a story or “writes” a page of looped lines something could be deduced from it’. However, Hall (2009) had contradictory view about the value of child’s drawing because on one hand it is seen as a means of communicating ideas, feelings and experiences while on the other regarding it as mark-making and a preparation for writing. In another context, Wright (2011), conversely, feels that the act of drawing is much more than a pre-writing skill, and so she believes that it helps children to gather thoughts and represent ideas as a form of visual storytelling which later supports the child’s transition to a more formal understanding of both literacy and numeracy.

1.1 Statement of the Problem

Scribbling is regarded as an exciting, serious and stimulating activity among children. Normally, children scribble or draw with enthusiasm and make gestures when describing or enacting something to representing that action in early scribbles and drawings (Coates and Coates, 2010). The study preliminary investigations pointed out that teachers and parents paid little attention to efforts children make on paper through scribblings and drawings thereby making these efforts unproductive in terms of children’s artistic thinking and growth. It is against this set back that the study seeks to develop ideas from these scribblings or drawings and execute them in 3-dimensional forms to enhance children’s cognitivevalues.

1.2 Objective of the Study

To develop ideas from children’s scribbles to create 3-dimensional forms in clay (bisque fired) and 3D abstract animation to promote creative thinking among children.

1.3 Research Question

How can scribblings be developed into clay and 3D abstract animation works to promote children’s creative growth?

1.4 Importance of the Study

The study would be useful in teaching and developing artistic growth in children.

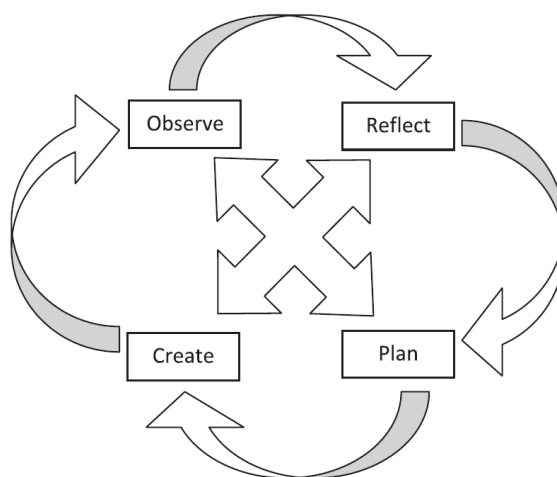
1.5 Scope of the Study

The works would be created from child’s scribbles or drawings of pre-schematic stage (4-7 years) and executed in clay (bisque fired) and 3D abstract animation.

2.0 Materials and Methods

The study adopted a studio-based research method of the qualitative research design and employed the aesthetico-action research method by observing, reflecting, planning and creating the clay and 3D abstract animation artworks composition from a child’s scribbles and root of a plant. The study also used observation as a research instrument to produce the artforms composition. The studio-based research deals with practically oriented method which involves the artist’s freedom of exploring and experimenting with materials to produce interesting art pieces (Manu et al. 2020).

Fig.1: Aesthetico-Action Research Cycle



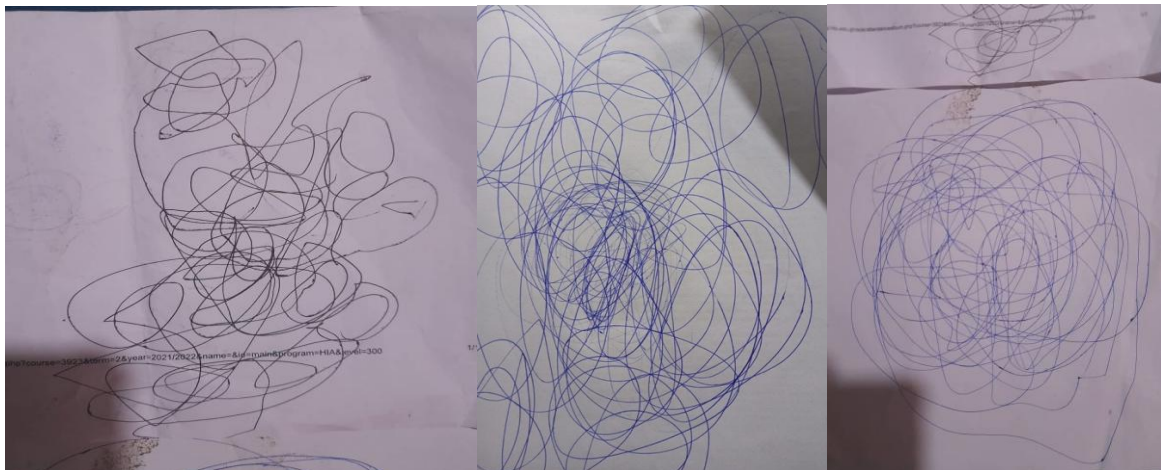
Source: Cora Marshal (2010)

The cycle utilizes four (4) distinct actions namely; by observing, reflecting, planning and creating. By observing, the researchers observed with prospects of developing ideas from the scribblings or drawings done by a child (pre-schematic stage) and creating designs from root of a plant. By reflecting, the researchers generated different ideas from the scribblings or drawings as seen in figure 2. By planning, creative ideas were generated from the scribblings in figure 2 and were developed into 2-dimensional on paper as seen in figures 5 and 6. By creating, the final drawings were selected and executed by using clay as raw material to produce the clay artwork composition in 3-dimensional forms as captured in figures 12 and 13. Every piece of art in a way communicates a message or serves as a means of communication. Based on this, the researchers focused further on employing clay artwork compositions to depict ideas.

2.1 Idea Development Stage

The idea development emanated from the scribblings made up of lines and intertwined root of a plant. According to Porta et al (2008), a line is a path connecting two locations in space. Lines in a composition, whether they are vertical, diagonal, or horizontal, assist or draw the viewer's attention to a particular area. Instead of only using straight lines, curved or patterned lines can be used to provide textures (Adams, 2013). According to Adams, an artist can use idea development to transform an existing piece of work into a compelling one. This position by Adams (2013) motivated the study by using unconscious scribbling of a Kindergarten II pupil (pre-schematic stage – 5 years) as one of the sources of idea development and transform the scribbling into appealing clay and 3D abstract animation artworks. From figures 2, 3 and 4, the lines intertwined each other and created a representation of union and unity that should exist unconsciously among people living in the same environment such as schools, hospitals and offices (Smelser, 2015). Consequently, observations made from figure 4 revealed that all the intertwined roots emerged from a source that is the main stalk of the tree. The researchers were also inspired by the idea of collectivism; thus all the lines coming together at a point and all the irregular shapes in intertwined root of a tree have one source, thereby drawing the attention to the fact that, the word 'unity' is mentioned when considering the elements of design. Unity is one of the principles of art or design and its creation is achieved when elements are arranged in a certain order as seen in figure 3. This led to a hasty attempt to tie these intriguing ideas to a clay and 3D abstract animation artworks composition. Thus, the unconscious scribbling or drawing and intertwined root of a tree served as the bases of idea developments of the clay and 3D animation artworks.

Fig. 2: Unconscious scribbling and drawing



(Sources: KG II pupil and field work, 2023.)

Fig.3: Intertwined root of a tree

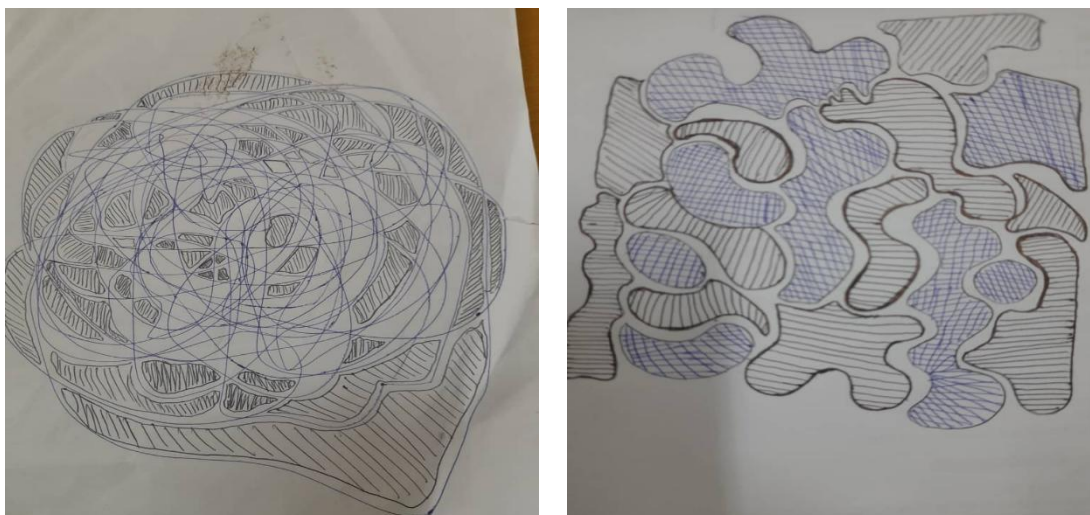


(Source: Field work. 2023)

2.2 Shapes from Unconscious Scribbling and Intertwined Roots

Gatto et al (2011) mention that the shape is the two-dimensional object made by lines and it can be broadly categorized into two types namely: geometric and organic. Geometric shapes are circles or squares while organic shapes are irregular shapes. Squiggles may be shapes, patterns, drawings, or scribbles anything we produce in an idle moment while the focus of our attention is elsewhere. Thorne et al (2004) explained that sketching a motion for a character requires a degree of abstraction not present when sketching geometry. The motion sketch needs to convey significant amount of information. In trying to get information from the sketching as posited by Thorne et al (2004), the researchers added value to the scribbles by separating shapes from the scribbles by drawing different shapes and created spaces from the scribbling as demonstrated in figure 5. According to Matthews (2003), abstract work uses a visual language of form, colour and line to create a composition, which may or may not exist. It is also not an accurate representation of a form or object and does not depict recognizable scenes or objects. All artworks contain largely elements that can be called abstract including elements of colours, lines and textures (Matthews, 2003). Therefore, in separating shapes and blocking spaces from the scribbling, the study considered these elements as exhibited in figures 4 and 5.

Fig.4: Separating shapes and spaces from scribbling



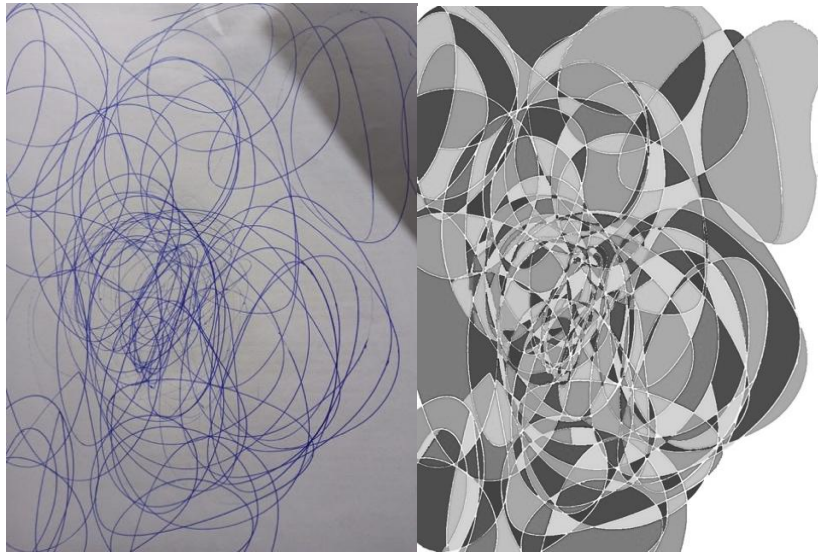


Fig.5: Shapes blocked from scribbling
(Source: Studio work, 2023)

2.3 Interpretation from the Concept of Design

Davis (1996) stated that a design could be seen in two folds – a process and a product. As a process, it is planning and organizing to meet a goal that is being carried out to meet a particular purpose. As a product, it is an end result emanated from the process or plan. Therefore, the scribbling would become a process and the final designs executed in three dimensional forms would become the product. It must be noted that elements and principles of design form integral part of every design work. As a result, different shapes were obtained from the unconscious scribbling and intertwined roots of the tree to create the design with the aid of shape, colour, space, line, value, and texture as highlighted in figure 6. In figure 7 the spaces were blocked with contrasting colours in Adobe Photoshop. The researchers' interpretation was that those spaces were not found in isolation but rather as a result of the unconscious scribbling and intertwined roots of the tree hence must be positioned in such a way to depict the original forms (White, 2011).



Fig. 6: value added created designs
(Source: studio work, 2023)



Fig. 7: Blocked spaces

To produce an image that may elicit a variety of emotions, provoke a certain atmosphere, or attract the attention in a specific direction, consideration must be given to how elements and principles of design are combined (Bloch, 1995). While the fundamental building blocks of every picture are the design elements, especially line. Designers also rely on the design principles, which are a set of guidelines for using the design components in a way that results in compositions that are aesthetically attractive with conceptual meaning. Hence, the application of curved or patterned features created in figures 7 and 8 to exhibit textures as part of the design process to make artwork. Hope (2008) defines artwork and for that matter drawing, as a form of a meaningful mark making that tends to satisfy people for different purposes. Hereafter, the motivation for this study to take inspirations from a child's scribbles, make conceptual art forms and execute them in clay.

2.4 Production of Forms and Spaces in Clay

In executing the final designs in spaces and forms, clay as ceramic raw material was used. Clay is a sticky material from the earth that is made into different shapes and forms, becomes hard when dried or heated (Nelson & Burkett, 2002).

Gatto et al (2011) claim that form is the three-dimensional object which has not only width and height but also depth. Therefore, the final designs selected were executed in three-dimensional forms with the aid of the following tools and equipment;

- I. Rolling pin and board – they were used to roll the clay into slabs.
- II. Cutting knife – it was used to cut the clay slabs into the required sizes.
- III. Cutting wire – it was used to cut the clay into pieces to remove unwanted materials from the clay.
- IV. Modelling tools – they were used to model the clay into the required forms.
- V. Brush – it was used to clean any unwanted particles of clay after modelling.
- VI. Ruler – it was used to measure the required sizes of the modelled clay.

Tool and equipment employed in the execution of the wares have been showcased in figure 8.



Fig.8: Tools and equipment for production

2.4.1 Clay Preparation and Formation

Balls of clay were aged for three (3) weeks. The purpose of the ageing was to make the clay more plastic so that the required shapes and forms could be obtained without cracking. It was then wedged by cutting the clay into pieces using a cutting wire to remove unwanted materials such as stones, broken sticks and lumps from it. This is because clay has some impurities and when not removed could disturb the plasticity of the clay (Nelson, 1984). The wedged clay was then kneaded to remove air bubbles and also to render the clay into an even consistency. The kneading process and kneaded clays have been highlighted in figures 9 and 10 respectively.



Fig.9: Kneading of wedged clay



Fig.10: Kneaded clays

The kneaded clay was then rolled into slab forms with the aid of sack board and rolling pin and cut into required sizes as seen in figures 11 and 12 respectively.



Fig.11: Rolling of clay slab Fig.12: Cutting of slabs

At the green ware stage, the cut pieces were coiled and formed until enough designs were obtained according to the final sketches as captured in figure 13.



Fig. 13: Production of forms and spaces using clay.
(Source: Studio work, 2023)

2.4.2 Drying and Firing of Created Forms

Prior to firing, the created forms (three-dimensional) were kept in an open space for five weeks to air dry as seen in Figure 15. Thus, the forms were kept at almost ambient humidity and temperature. The purpose was to ensure that wares would be dried enough to reduce or minimize warping and cracking during firing.



Fig.14: Drying of created forms in an open space

Carter (2002) explained that there are four kinds of water in wet clay namely; shrinkage water, pore water, surface absorbed water, and interlayer and crystal lattice water also known as water of hydration. Carter (2002) further mentioned that the first water that is lost as the clay dries is shrinkage water. After drying, the created forms were fired by placing them into a receptacle to prevent them from breaking and cracking since most of them were fragile at the bone-dry stage. The receptacle again served as a crucible in preventing direct temperature which might cause the shapes to crack. After the shapes were arranged into a crucible or a receptacle, they were arranged into a firewood kiln seen in figure 15.



Fig.15: Firewood kiln

Preheating was done twenty (20) minutes to thirty (30) minutes. The purpose of the pre-heating was to allow gradual loss of physical water and also to prevent the pieces from cracking. The temperature of the kiln was progressively increased till 'full blast' of fire was introduced which lasted for twelve hours. Through experiences, looking at the colour inside the kiln temperature which was orange, the study determined the matured temperature was between 950°C to 1000°C. The kiln was allowed to cool down for a day before the wares were taken out from the kiln. It was realized that at the maturing temperature between 950°C to 1000°C, the forms developed from the scribblings had been successfully fired as shown in figure 16.



Fig. 16: Bisque fired forms and spaces.
(Source: Studio work, 2023)

2.5 Preparing scribbling for 3D Animation

Mayer and Moreno(2002) describe animation as a pictorial presentation of motion pictures that displays relations between drawn figures. In applying 3D animation principles as alluded to by (Wojtan et al, 2006), the scanned scribbling image was imported into Adobe Photoshop and the magic wand tool used to select the space as indicated in figure 17. The selected spaces were filled with contrasting colours using the paint bucket tool (figure 18). These processes were repeated to all the spaces in the scanned scribbling image and after all the spaces were filled, the individual ten colours used needed to be separated onto different layers and saved in JPEG files.

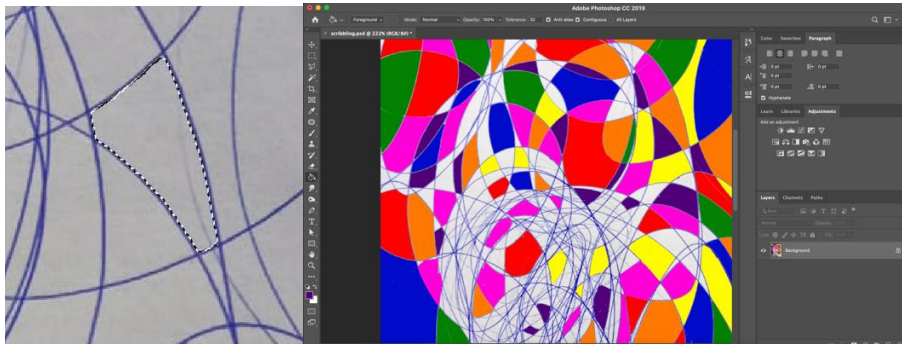


Fig.17: Selection

Fig.18: Selected spaces filled with colour
(Source: Studio work, 2023)

The colour range tool was selected from the select menu, the orange colour was selected in the scribbled work with the eyedropper icon. As captured in figure 19, all the orange colours were selected at the same as confirmed by the colour range preview window. A new layer was created and renamed, the base layer containing the scribbling work was muted to have a clear view of the orange colour selection. The brush tool was used to paint over the selected areas (figure 20) and save it in JPEG file. The colour separation processes were done to all the nine remaining colours found in the scribbling work.

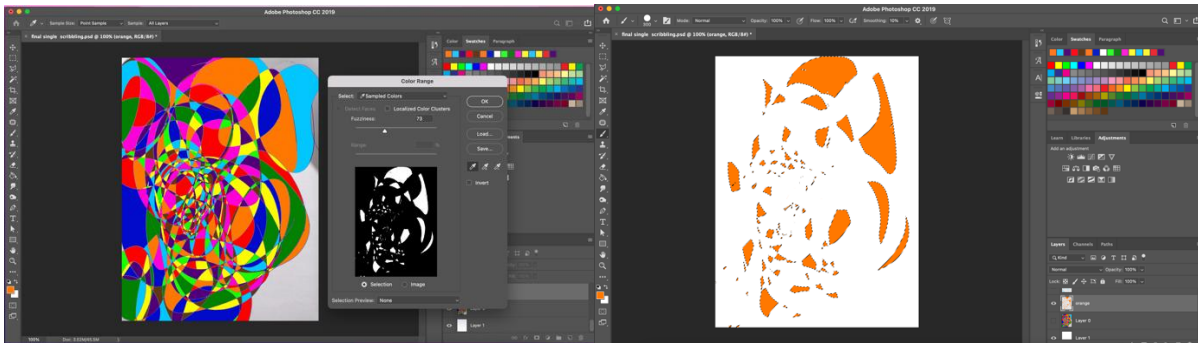


Fig. 19: Colour selection
(Source: Studio work, 2023)

Fig. 20: Filling selection with orange colour

The colour separated files were placed in Adobe Illustrator and centered on a new document one at a time. The silhouettes option of the image trace was used to convert the colour separated JPEG files into vector form (figure 21) since 3D applications are vector base. The traced images were expanded to allow the black silhouette colour changed to its original colours as indicated in figure 22.

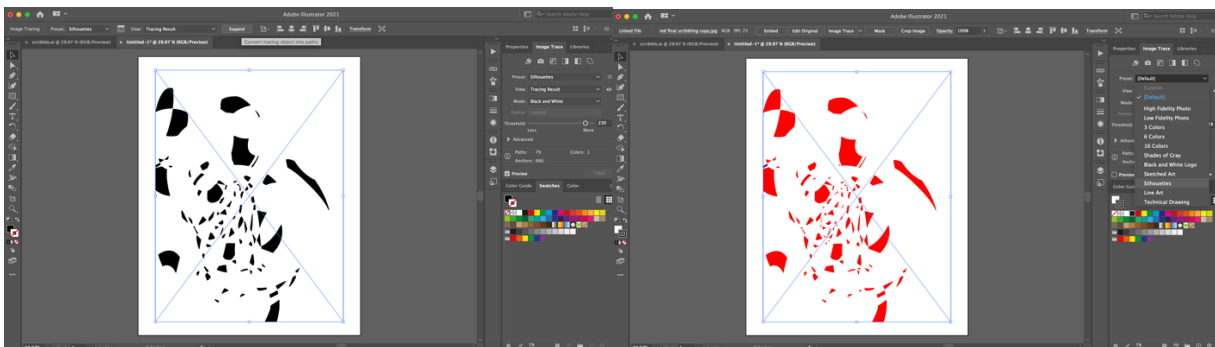


Fig. 21: Silhouette tracing
(Source: Studio work, 2023)

Fig. 22: Silhouette colour changed

The other converted vector files were copied and superimposed on each other to form the complete scribbling design shown in figure 23, later the scribbling design was changed to outlines only (figure 24). The scribbling outlined work was saved in Adobe Illustrator version 8, because that is compatible with Cinema 4D.

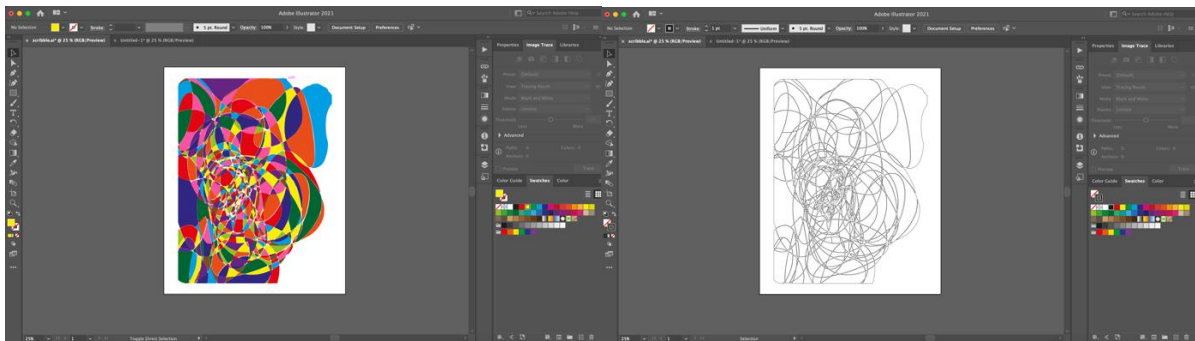


Fig. 23: superimposed separated colours Fig. 24: Outline of scribbling design
(Source: Studio work, 2023)

2.5.1 Production of 3D Abstract Animation

The scribbling outlined work was imported into Cinema 4D and the outlines extruded. Under the extrude NURBS in the attribute manager, the hierarchical option under the object tab was selected to extrude the individual spaces into solid. The settings of X, Y, Z values were changed to determine the thickness and direction (movement) of the extrusion as highlighted with the red box in figure 25.

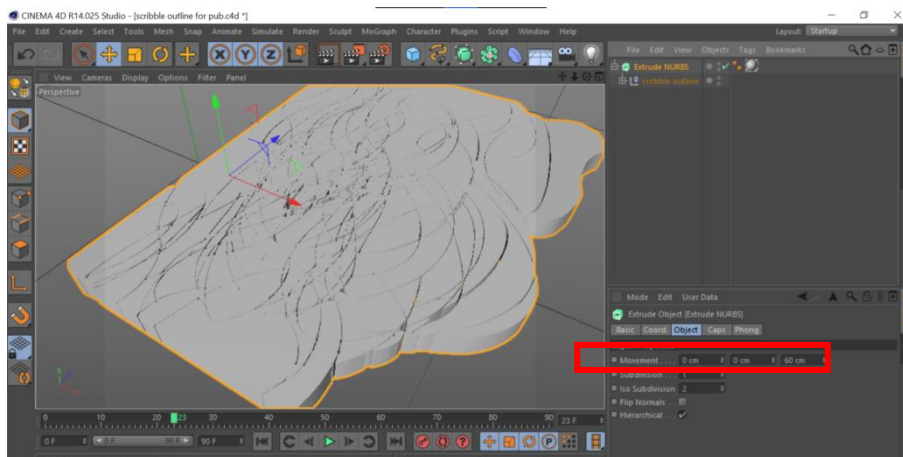


Fig. 25: X, Y, Z values
(Source: Studio work, 2023)

From the MoGraph menu the fracture option was selected and the extruded scribbling was made as a child within the object manager of the Cinema 4D interface. In the object tab of the fracture, the explode segments option was selected to allow the individual extruded spaces respond to the animation differently. Like puppet, they are animated with strings, the 3D abstract scribbling animation also needs some drivers to control the animation. The researchers used the plain effectors from the MoGraph menu to drive the animation; the shape of the falloff of the plain effector within the attribute manager was changed to sphere as shown in figure 26. The parameter of the plain effector was setup to affect only the Z position, deactivating the scale rotation and colour mode options (figure 27).

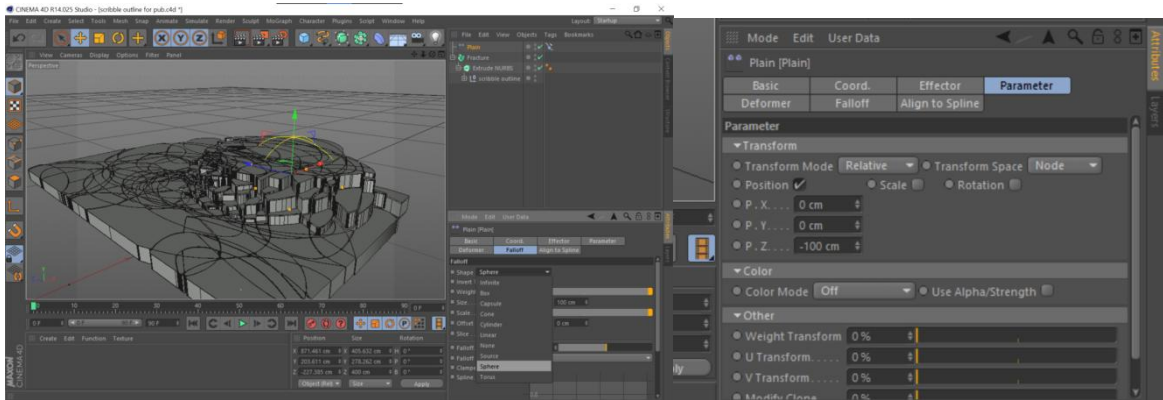


Fig. 26: Falloff option (Source: Studio work, 2023)

Fig. 27: Plain effector parameter settings

At this point moving the sphere (effector) affects only the up and down movement of the extruded scribbling design. The researchers drew a curve to take the form of a scribbling, and the sphere (effector) was constraint to take the movement of the curve using the align to spline tag (path animation) as indicated in figure 28. The researchers added the spring option from the delay effector and increased the strength to 86% to give it continues animation effect (figure 29).

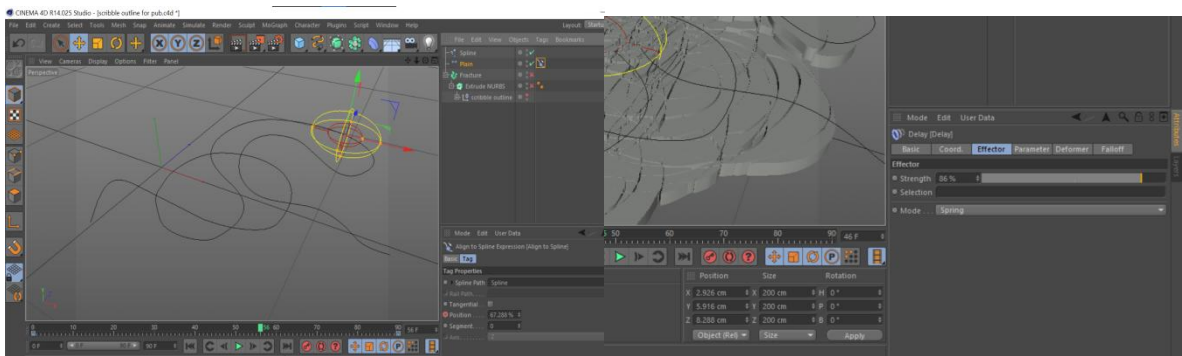
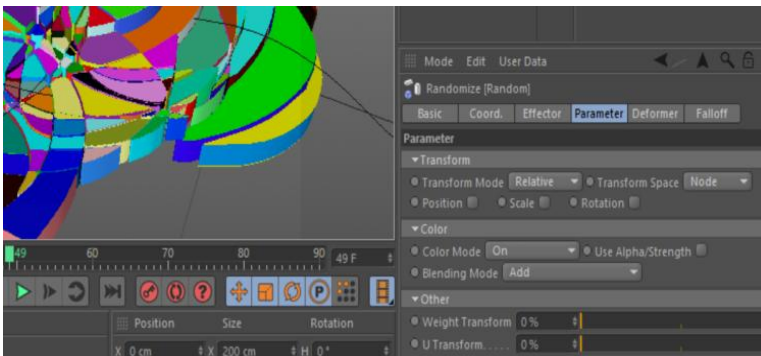


Fig. 28: Align to spline tag animation (Source: Studio work, 2023)

Fig. 29: Delay effector settings

The random effector was used to randomly assign different colours to the extruded spaces of the 3D abstract scribbling. To achieve the random colours; the position, scale, rotation in the attribute manager of the random effector were deactivated and the colour mode turned on with the blending mode set to add as shown in figure 30. Area and infinite lights were used to light up the screen, the render setup was set to include ambient occlusion; within the output settings the frame range was set to all frames and AVI movie format was selected from the save settings. The final work was rendered and previewed as shown in figure 31, the link to the final preview is <https://www.youtube.com/channel/UCIXpo5JlgjhMnRChYJIFFAg>.



30: Random colour setting (Source: Field work, 2023)

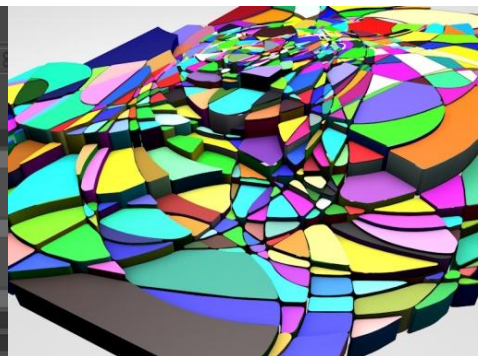


Fig. 31: Rendered 3D abstract scribbling

Fig.

3.1 Results and Discussions

This aspect of the study gives the qualitative discussions emanated from the final assemblage of the artworks. The created clay artwork and the rendered 3D abstract scribbling were mounted at the Art Gallery of the Centre for National Culture in Kumasi for viewing, interpretation and understanding of the concept by the general public. A three-dimensional visual artwork that is typically produced specifically for a location (art gallery) and intended to alter viewers' perceptions of space is known as an art assemblage. The term 'assemblage' (installation) which first appeared in the 1970s, is typically used to describe artwork made for interior spaces such as galleries and museums; and in the late 1980's some experienced artists specialized in assemblage (Tate, 2010). Figures 34 and 35 were typical mounted installations ready for public viewing and interpretations.



Fig. 32: Final assemblage of created forms on the floor of the art gallery

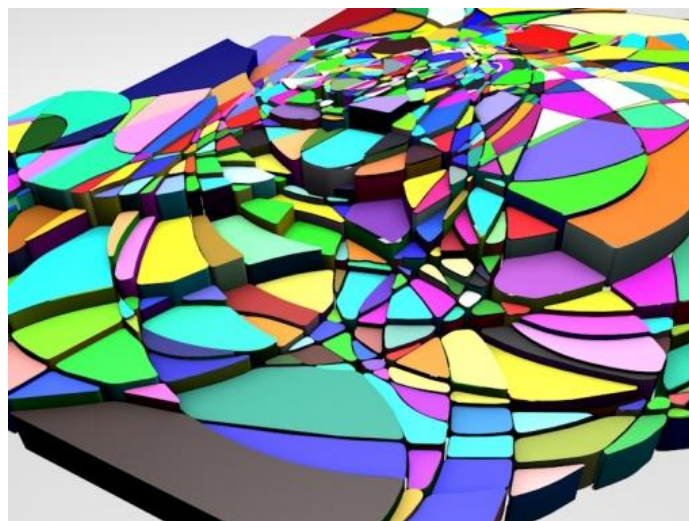


Fig 33. Final rendered 3D abstract scribbling displayed at the gallery

3.2 Viewers' Interpretation and Understanding of Concept

The views expressed by viewers on the final assemblage of the works (clay artwork and the rendered 3D abstract scribbling) at the Art Gallery of the Centre for National Culture in Kumasi were gathered through on-site interview session by the researchers. Purposive sampling method as a nonprobability sampling technique was used to select a total of twenty (20) viewers comprising five (5) visual art teachers and fifteen (15) basic school pupils who study creative art as a subject from the Kumasi Metropolitan Assembly (KMA). People or location are

intentionally sought because they meet some criteria for inclusion in the study (Palys, 1997). The study was very critical about ethical approach, especially the involvement of some school pupils as viewers. Therefore, the purpose of the research was duly explained to them in the language they understood, assured of confidentiality relating to taking of photographs, audio and video recordings to enable them fully participate in the study. It must be acknowledged that it is the responsibility of a researcher to do all in his or her power to ensure that participants in a research study are protected from physical or psychological harm, discomfort, or danger that may arise due to research procedures (Fraenkel & Wallen, 2009). As a result, the researchers had to interview pupils who were willing to talk and the rest to appreciate the clay art piece. These viewers had their views initially recorded, transcribed and analyzed qualitatively through the representation of key ideas expressed through thick quoting to represent their voices (Lecompte and Schensul, 1996).

Views expressed by three (3) Art Teachers and nine (9) pupils through transcription indicated that 'the clay work was aesthetically appealing and the joining of rings could represent the Olympic symbol (the Olympic rings) expressing the activity of the Olympic Movement and represents the union of the five continents and the meeting of athletes from throughout the world at the Olympic Games. Concerning the rendered 3D animation scribbles, the views expressed by the viewers indicated that animation was appealing. They could sense some form of uniformity and belongingness in the work (3- Art Teachers, 9- pupils; personal interviews, July 20, 2022)

Looking at the work from afar, the continuous joining of rings could depict the source of strength and unity. It could be for a family, a nation or continent as it could support the saying that unity is strength. Talking about the 3D animation, the viewer was of the opinion that the work represented excitement and joyful mood of group of people in a society (Art Teacher -1- personal interview, July 20, 2022)

The brown colour of the work makes the artefact artistically interesting. Thus, the brownish nature of the work gives much understanding to the fact that clay is associated with the earth and the earth is assumed to be circular by nature. For the 3D animation, the viewers were of the view that even though the work was aesthetically pleasing, it appeared like a chaotic scene coming from a source. This confirms Smelser's (2015:311) assertion that lines that intertwine each other create a representation of union and unity that should exist unconsciously among people living in the same environment. (Pupils -5- personal interviews, July 21, 2022)

The earth being circular could also be linked to the Olympic Games flag with circular basic shapes of different colours put together to suggest a meaning of friendship, peace and unity. The assemblage of the artefacts depict the relevance of the earth being a global village and therefore there was the need for peaceful and unified co-existence among members in communities or societies just as the Olympic Games flag has similar meanings. Similar shapes could be compared in figures 34, 35 and 36 below.

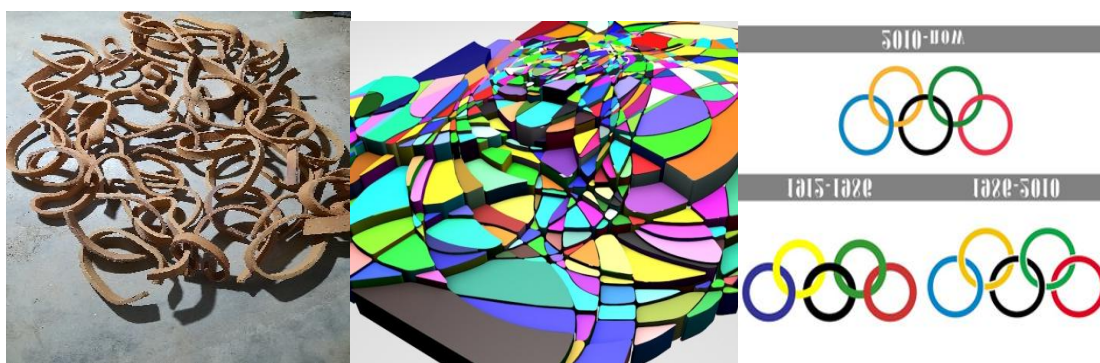


Fig.34: Fired shapes and spaces Fig.35: 3D abstract scribbling Fig.36: Intertwined Olympic Flag.
(Source of flag: <https://www.google.com/search?q=olympic+game+symbol+meaning&client>).

Again, through the study the comparative ideas generated from the clay work in figure 34, 3D animation in figure 35 and the Olympic flag in figure 36 pointed out that all the three (3) figures have a sense of unity and carry a significant meaning of promoting good bonds or unity among societies or nations.

The study picked excerpts from one of the pupils aged 6 years with reflective listening - verbal listening behaviour that helps a person feel understood and accepted (Dillard and Reilly, 1988) as followed;

Interviewer: would you like to draw?

Pupil: scribbling

Interviewer; what feelings does your scribbling tell you?

Pupil: I feel happy if my friends tell me it is nice.

Interviewer: what about your art teacher?

Pupil: my teacher would just mark it.

Interviewer: just that?

Pupil: but at times he says it is nice.

Interviewer: and how do you feel?

Pupil real happiness!!!!!!!

Interviewer: a real happiness. What kind of thing would make you feel happy?

Pupil: if my teacher and friends would say my scribbling is very nice.

Interviewer: can you see a similar thing between scribbling, this 3D animation and the clay work?

Pupil: I can see curves, lines and shapes.

Interviewer: how do you feel about the clay work and the 3D animation?

Pupil: they are very interesting and I feel so much happy.

Interviewer: would you like to know how to do them?

Pupil: if only my teacher would teach me how to do them. (Pupil-1- personal interview, July 20, 2022)

Another art teacher advocated that the clay work and the 3D animation could be used as teaching and learning tools for promoting children's creative skills and growth (art teacher -1- personal interview, July 20, 2022). This advocacy supports Coates and Coates (2010) assertion that children's drawings and art activities give a deeper understanding of the child's mental and psychological states.

4.0 Conclusion and Recommendations

The study had been able to draw inspirations from kids' scribbles and developed creative designs from it through the roots of natural tree to make clay work and 3D abstract animation to become assemblage art with skilful designs and aesthetic values. Therefore, the study recommends that ceramic and graphic artists explore the possibility of developing kids' scribbles and come out with interesting designs and execute them in clay art and 3D abstract animation for aesthetic, educational, societal and children's cognitive values. Again, it is also recommended that serious attention should be given to children's scribbles and art activities in schools since kids' scribbles could be generated into conceptual art forms through clay artworks and 3D abstract animations.

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