



# Texture and Tactility: Exploring Perception through Touch for Blind and Visually Impaired Students in Creating Visual Arts

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**Citation:** Mohd Fauzi Sedon et al. (2024) Texture and Tactility: Exploring Perception through Touch for Blind and Visually Impaired Students in Creating Visual Arts, *Educational Administration: Theory and Practice*, 30(7), 38-46  
Doi: 10.53555/kuey.v30i7.6430

## ARTICLE INFO

## ABSTRACT

This research project focuses on making art accessible to blind and visually impaired students by exploring the beauty of nature and manmade objects through the concepts of texture and tactility. Although it is usually assumed that blind and visually impaired people would have little interest or talent in creating images, they can be created in a variety of different ways and methods. The research project emphasizes the exploration of the creative process, which is designed to provide exposure, experience, and additional skills to nurture self-confidence, optimism, enthusiasm, and talent development. This qualitative research project used the case study method. The research employed creative studio and content analysis approaches by using the elements and principles of art and design. The research project significantly reviews how blind and visually impaired students are able to reinterpret texture and imply patterns in a variety of visual artworks inspired by design in nature and design by man. Thus, these special students have the potential to show an exceptional level of skill and talent that establishes the sense of touch as a method of mental representation between imagination and the realization of the creative process. Furthermore, this research project would inspire a new perception of interactivity in the learning activities of blind and visually impaired students towards improving the quality of special education.

**Index Terms**— Blind and Visually Impaired, Pattern, Texture, Tactility, Visual Arts.

## I. INTRODUCTION

Blind and visually impaired students are the circle who urgently need help, support, and guidance the most to enable them to liberate their imagination to a higher level and understand the environment in a clearer and more meaningful way. They may be individuals who are delayed in conceptual development and cognitive abilities, and they may fail more in skills that require particularly abstract thinking, as in [1]. Meanwhile, as in [2] argues that normally visually impaired students also have some difficulties in school life. Therefore, teachers play a very important role in discovering and developing talent.

The subject of Visual Arts Education requires a deep understanding and a high level of creativity that allows the processing and application of creativity and skill in various forms, situations, and circumstances. Therefore, the research project focuses on the easiest and simplest method of making art products within the concept of 'touch and texture' through a variety of new explorations in order to increase the level of education and skills of students. The project emphasizes on the exploration of the creative process that involves painting, printmaking, batik and ceramic. Mainly, this project is designed to provide exposure, experience, and additional skills to nurture self-confidence, optimism, enthusiasm, and talent development. Reference [3] mentions that people with vision impairments can do just as much as people with sight and often surpass their achievements.

## II. TACTILITY: PERCEPTION THROUGH TOUCH

Touch serves an essential function in human development and survival. The sense of touch mediates our ability to perceive how the surrounding physically acts on us and how we react to the environment and also ourselves. Reference [4] states that affective touch is an important means of social interaction. Therefore, the sensitivity to perception through touch relies much more on experience to integrate other senses and visualization ability. Reference [5] suggests:

“We are able to perceive because objects have distinct surfaces, both visibly and tangibly (the surfaces also affect taste and audition). Our perceptual system extracts information about surfaces from our sensory arrays, and more than one sense detects the relief formed by the arrangement of flat and curved surfaces, their corners, vertices, edges, and boundaries”.

Tactility is based on physical contact with the environment through the sense of touch. The ability to touch is one of the most important factors in gathering our tactile experience related to material characteristics and surfaces that evoke certain emotional responses. This unique reaction that we get from the tactile sense is what makes it so attractive and exciting, and most importantly, it will be able to give us the feeling of sensation and pleasure. The experience of touch leads to sensations that involve both discriminative and emotional aspects as in [6].

Knowing to use the sense of touch effectively may provoke perception, imagination and understanding toward the subject touched. Reference [7] argues that touch is somehow more fundamental than the other senses insofar as it is more intimately bound up with our bodily nature. Moreover, the systematic process of exploration (which includes sensing through pressure to observe hardness, volume, and shape, following the contour and movements to detect texture and friction) will allow for greater ease of encoding that provides functional information to construct a visual cognitive representation of the object. Reference [8] states that intuitive, in some sense going beyond some expected limitations such as behavioural, perceptual, and cognitive, tells something about extending human potential. Fundamentally, the sense of touch allows us creatively to modify and manipulate the physical world through different perceptions and interactions that form unique and collective aesthetic experiences. Meanwhile, as in [9] argues that interactions between symbols, the self, and the environment provide the material for abstract intellectual processes.

Images can be created in a variety of different ways and methods, and we normally assume that blind and visually impaired people would have little interest or talent in creating images. However, as in [10] suggests that blind and sighted people use many of the same devices in sketching their surroundings, suggesting that vision and touch are closely linked. Basically, everybody uses their particular skills to meaningfully express themselves and convey ideas both to sighted and visually impaired subjects. The act of tactile drawings, for example, will eventually reveal a trace of the physical act as well as the thinking process. Reference [11] mentions that the act of drawing makes the magical identity of thought and action possible because drawing is the quickest medium and can, therefore, protect the intensity of thought. To draw is never a transcript (in the sense of writing) but rather a formulation of elaboration of the thought itself at the very moment it translates itself into an image.

Different people usually will notice different things and process information differently. The process of drawing (re-experiencing through touch) has the potential to enable the blind and visually impaired to develop their understanding of integrating perception and imagination more efficiently. Reference [12] says that this engagement has the potential to both evoke the memory of the experience of the object or part of the physical world and generate a further experience as the detail of the drawing is experienced through the movement of the body and touch of the fingertips.

Furthermore, the process of touching will highlight the fundamental difference between the subjects physically and emotionally and significantly allow the individuals to construct, manipulate, and translate the contents of their mental representations. Through tactile drawings we will be able to construct the creative representation between imagination and realization. Reference [13] states that the line as illusion or reality, a reference to a fictional object of representation or the indexical trace of its own creator.

Vision may be the primary modality of image perception. However, the sense of touch can also access spatial representations through long-term experience and memory. Reference [10] suggests that as time goes by, blind individuals will gradually become more skilled and will eventually develop extraordinarily. Moreover, as in [14] mentions, haptic exploration is the sensory modality most closely linked to dynamic perception, the basis of aesthetic experiences, and tangibly perceiving the interaction between space and shape allows for the effective conveyance of expression. The skill of developing mental representation is closely connected to exposure to the subjects and materials, guidance, and experience that suggests that blind individuals also would have the ability to produce pictorials that are similar in artistry and proficiency to sighted individuals. Reference [15] suggests the fact that congenitally blind individuals are able to identify and create relatively complex images and geometrical patterns, skills that would seem inherently visual, suggests that the underlying principles of mental imagery are inter-modal. Meanwhile, [16] argues that by embracing tactile, auditory, and sensory experiences, individuals with visual impairments create and appreciate art in unique

ways. Furthermore, tactile modalities will be able to improve the autonomous access to information and experience of visual artworks as in [17].

Aesthetically, tactile drawings (in any form) will significantly stimulate access to the imaginary and symbolic physical representation of the blind and visually impaired, which enables them to communicate and achieve a better understanding of their surroundings and themselves. This allows sighted people to better understand the world of the blind and visually impaired and allows them to interact more effectively and actively.

### III. METHODOLOGY

The project used the Creative Studio Workshop approach to train and transfer knowledge and skill to blind and visually impaired students through the concept of 'touch and texture' in creating Visual Arts by using the natural environment and man-made items as a source of subjects.

The qualitative research project used the case study method, which was conducted in the Secondary School for Special Education (Visually Impaired) Setapak, Kuala Lumpur. This research employed creative studio and content analysis approaches by using the elements of art and the principles of art and design. The participants of the study comprised 16 form 4 students, and purposeful sampling was used as a sampling method. Reference [18] argues that to use purposeful sampling because particular subject facilitates the development of the concept or theory.

**Table I:** Data of active participants

No.	Vision Level	No. of Students
1	Low vision	4
2	Near-blindness	4
3	Totally blind	8

#### Creative Studio

The creative studio approach is the studio experimentation on the development process by experimenting through material and media manipulation. Reference [19] stated that in creative art, the studio is the 'natural' working environment where the artist dreams, explores, experiments, and creates. Meanwhile, as in [20] argues that the studio offers insights into making and knowledge that are investigative and experimental into practice and skills needed in order to transform initial plans and ideas into material work.

The research project focuses on several elements of art making, such as the handling of materials, processes, techniques, and the development of ideas. It gave priority to the exploration of alternative approaches in art that are based on the principle of 'touch and texture', mainly on surface elements, shapes, and forms. The project focuses on five areas of Visual Arts, which are painting, print, sculpture, ceramic, and batik. Reference [21] mentioned that the capacity and the role of art education is to represent the ability of people with visual impairments as self-exploration in terms of their sense abilities.

#### The Elements of Art and the Principles and Design

The Elements of Art and the Principles of Design are the stylistic features, or the visual elements, is a visual language used and arranged to produce works of art. It is an element arranged for the artist to communicate through the arrangement of imagery in a particular composition. In addition, this visual language is an element that needs to be understood for the analysis and appreciation process of works of art. Reference [22] outline the basic Elements of Art and Principles of Design are as follows:

**Table II:** Elements of Art

Line	Defined by a point moving in space. Line may be two-or three-dimensional, descriptive, implied, or abstract.
Shape	Two dimensional, flat, or limited to height and width.
Form	Three-dimensional and encloses volume; includes height, width and depth
Value	The lightness or darkness of tones or colours.
Space	Positive and negative areas or a sense of depth.
Colour	<ul style="list-style-type: none"> <li>• Hue: name of colour</li> <li>• Value: hue's lightness and darkness (a colour's value changes when white or black is added)</li> <li>• Intensity: quality of brightness and purity (high intensity = colour is strong and bright; low intensity = colour is faint and dull)</li> </ul>
Texture	Refers to the way things feel, or look as if they might feel if touched.

**Table III:** Principles of Design

Rhythm	Indicates movement, created by the careful placement of repeated elements to cause a visual tempo or beat.
Balance	A way of combining elements to add a feeling of equilibrium or stability - symmetrical and asymmetrical.
Emphasis (Contrast)	A way of combining elements to stress the differences between those elements.
Proportion	Refers to the relationship of certain elements to the whole and to each other.
Harmony	A way of combining similar to accent their similarities (achieved through use of repetitions and subtle gradual changes)
Movement	Used to create the look and feeling of action and to guide the viewer's eye.

Unity	Concerned with appropriate ratio between harmony and variety to give a sense of oneness.
Variety	Concerned with diversity or contrast -achieved by using different shapes, sizes, and/or colours.
Repetition	The reusing of the same or similar elements. Repetition of certain design elements in a design will bring a clear sense of unity and consistency.
Pattern	Underlying structure that organizes surfaces in a consistent and regular manner (repeated same elements i.e. line, shape, colour, etc.).

#### IV. ANALYSIS AND FINDINGS

##### Printmaking

Collagraph printmaking can be a very interesting way of working mainly because of the many different effects that can be created and the great variation in textural quality from using different materials. The materials applied onto the plate will determine the tone and the intensity of the ink and will also give variations of textures and effects. The collagraph printing method is used with students pasting various types of leaves on the surface of the blocks that have been prepared. The colour of the poster paint is applied through brush strokes and the use of a roller.



**Fig. I.** Printmaking Workshop

Students created artworks using various shapes of leaves from a wide variety of plants that have differences in terms of size, thickness, and especially the structure of texture. The use of materials from natural sources has been a new experience for students to understand the richness and uniqueness of the plant's characteristics that are all around them. The combination of textural quality of foliage in the form of free composition sparks excitement and challenges the imagination of the resulting works of art that directly enhance the value and potential of creativity.



**Fig. II.** Collagraph Artworks (A)

The artwork uses a combination of three types of leaves, which are straight and small, long, wide, and round, with a combination of green-based colours - yellow, blue, green, with a little orange. This work is very interesting from the aspect of composition with elements of movement in various directions through the arrangement of leaves that have repetitive of various lines interweaving, shapes, and sizes. The spontaneous effects of the colour mixture between bright yellow and dark green create a unique interwoven effect on the character and nature of each type of leaf used. The difference in the colour tone used also creates the effect of contrasting images and the illusion of compositional space, in addition to producing a harmonious effect.



**Fig. III.** Collagraph Artworks (B)

This artwork uses three types of leaves, which are circular, parallel striped, and small straight. This work uses a thin brush of color through a combination of red, purple, orange, and green. This work of art succeeds in creating a clear and unique character of leaf textural through a combination of light and dark color tones that move from the bottom to the top. The position of the wide webbed leaves in the upper left becomes the focus of the composition, which is offset by the effect of fine leaves placed vertically on the right. Overall, this work of art is very interesting from a compositional aspect through the vertical arrangement of leaves in addition to the combination of repeating fine lines, which creates a contrasting effect that activates the compositional space.

### **Ceramic**

Stencilling and pressing techniques were used as a method for the production of ceramic projects. The students were exposed to the process of ceramic using clay by exploring the patterns of nature. Active participation of these students has produced ceramic works which are extremely high in aesthetic value thereof; the effects of obvious textural patterns decorated with a combination of striking colours created visual effects that are unique and interesting.

Moreover, the process of re-experiencing through touch has the potential to enable the blind and visually impaired to develop their understanding of integrating perception and imagination more efficiently.



**Fig. IV.** Ceramic Workshop



**Fig. V.** Ceramic Artworks (A)

This work uses a combination of leaf characters that are small pointed, and small repeated. The entire composition uses blue, green and yellow colours that are processed in various light and dark tones in a simple way. However, the resulting effect is very unique and can clearly show the interweaving, lines and shapes

between the positive and negative spaces. The use of different textural effects between left and right produces contrast and balance in the composition, which indirectly creates a movement of focus between the images.



**Fig. VI.** Ceramic Artworks (B)

This artwork uses a combination of two types of repeating leaves that are different in terms of shape and character. The use of red and light yellow colours with a little black successfully translates the uniqueness of the shape and texture of the leaves through the use of various light and dark tones. Overall, the resulting composition is quite abstract because of overlapping images (leaves) in different sizes. However, the characteristics of textures and shapes are still distinguishable in the clutter of image repetitions, which creates a harmonious effect.

### **Batik**

Batik tie-dye is a way of making unique decorative motives on the surface of fabric through the process of binding a specific desired part before dipping it into the dye. Common results achieved from the tie-dye are patterns of wrinkles and cracks in the form of lines created from the binding process.

Our world reveals an endless variety of forms and abounds in spectral colour, intricate shapes and structure, which not only delight our imagination but also challenge our understanding. In this project, the process of arranging and exploring patterns of a variety of shells and beads in unexpected ways developed an appreciation of the uniqueness of the natural world and man-made therefore, therefore creating an understanding of how versatile art can be while exploring the potential of the creative process.



**Fig. VII.** Batik Workshop



**Fig. VIII.** Batik Artworks (A)



**Fig. IX.** Batik Artworks (B)

Patterns in nature and man-made are just as dynamic and magnificent with all their splendid diversity and uniqueness of complex characteristics between chaotic and a rigidly ordered structure, yet recognizable. Various combinations of shapes and sizes of shells and beads that are tied in various sizes and positions produce a unique and distinctive look and weave effect. These two works have similarities and differences as a representation of reality in a world that has various unattainable characteristics. For example, A's artwork uses a lot of bright and dark colours that almost fill the entire composition space. In contrast, B's artwork uses a combination of bright and dark colours and leaves the white colour of the fabric, which creates the effect of radiating fine lines.

As a result of various combinations of hot and cold colours, bright and dark, both works of art produce effects that can be interpreted in various forms, such as floral or cosmic effects. The spontaneous approach in the production process of this work succeeds in producing a dynamic effect in the context of the effects and the appearance of interlaced forms in various colour combinations that seem to depict a magical atmosphere. This project provided an aesthetic perception to experience patterns in new and meaningful ways, which developed and reinforced the understanding of the concept of beauty and mystery in our world.

### **Painting**

Painting is the most flexible branch of visual arts in terms of form, technique and concept. Freedom in the context of the method and process of painting allowed the blind and visually impaired students to produce works of art that reflected the perceptions of their personal experience, where the understanding of the subject was mainly focused on the sense of touch. Stencil technique was the main method in the production of this painting project that used elements from several parts of a car (like nut and bolt, brake part, rubber and gasket) as a form of artistic representation. Brush strokes in a variety of unique colour compositions reflected the sensitivity of the imagination and the great level of concentration and commitment.

Aesthetically, tactile painting (drawing) eventually stimulated access to the imaginary and symbolic physical representation of the blind and visually impaired, enabling them to communicate and achieve a better understanding of their surrounding and themselves.



**Fig. X.** Painting Workshop



**Fig. XI.** Painting Artworks (A)

This work uses a minimalist concept by only using red and black colours through the use of nut and bolt objects to create abstract images. The composition of the image as a whole is concentrated in the centre of the space with a difference in black colour tones that are varied in gradation. Although this work is relatively simple in composition, the use of red with black contrast is able to activate the space through variation of lines, shapes and mark markings. The production of image effects of various shapes and directions indirectly creates the illusion of movement between the empty space of the background and the images.



**Fig. XII.** Painting Artworks (B)

This work uses a combination of brake parts, rubber and gaskets arranged in a stack through the use of bright colours. The effect of an image in the form of an orange-coloured circle resulting from absorbent rubber dominates the composition, which is the main element that controls the space. In addition, the effect of uneven brush strokes and overlapping marks creates the illusion of an image in the mental context of representation, where the abstract lines and shapes create movement within the chaotic composition. Overall, by exploring and experimenting with real shapes through stencil techniques, blind and visually impaired students can reinterpret patterns and imagine depth on two-dimensional surfaces.

### CONCLUSION

The Visual Arts project has brought not only fun and joy to the blind and visually impaired students in their art lessons but also exposed them to new knowledge and skills, as well as more engagement and empowerment in learning activities. What they gained from these art workshops have been a sense of achievement which will benefit the students' lives, renewing their self-esteem and preparing the skills to sustain them. Reference [23] says that experiencing art can bring spiritual satisfaction and self-enrichment including people in the blind community. Thus, these special students have the potential to show an exceptional level of skill and talent in one or more areas of expression. Hopefully, this project will be able to build a better future for the special-needs students particularly and the community generally towards improving the quality of education to a greater standard.

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