International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2019): 7.583

Handmade Tactile Book about Abstract Art for Blind Children

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Abstract: ***The tactile book is a resource that helps the blind student to access art's concepts and allowed them to build knowledge about aspects and nuances of culture. Our objective was to create and test a handmade tactile book for blind students who were attending the first cycle of elementary school. This book was presented to the art teacher and her five congenic blind kids during three workshops. Three questionnaires were applied to evaluate to explore the images and use geometric figures in the most diverse contexts in the Visual Arts class. The tactile book produced was named The Art in Forms. This book allowed students to read in the Braille System and haptically and might contribute to the inclusion of a visually impaired student in the artistic field of paintings made by great artists such as Kandinsky.***

Keywords: diversity; inclusion; questionnaire; workshop

1. Introduction

Tactile books are generally used to promote the development of literacy skills in literature and in any visually impaired child. This type of book is a must for supporting literacy instruction, for use in developing concepts and honing sensory efficiency skills. Our biggest challenge was be to present abstract art to blind children through tactile books. Therefore, we choose the Russian painter, musician, and writer Wassily Wassilyevich Kandinsky (1866-1944) to carry out our proposal (Tederixe&Lima, 2018; Tederixe, 2019).

We used the artistic elements that Kandinsky disposed and developed throughout his adult life between 1896 (when he was 30 years old) until the year of his death. Kandinsky configuring and transmuting the language of painting and music through artistic action in an abstract way. He painted outdoor landscapes in detriment to the realistic painting of living models under a clear influence of Impressionism (Wanner, 2010).

Kandinsky was an outstanding artist who is considered the father of the artistic movement called Abstractionism. The art critics consider that he inaugurated the Lyrical Abstraction movement with the painting entitled "First Abstract Watercolor" in 1910 (Kandinsky, 1996). Theorganic forms and vibrant colors are evident in Lyrical Abstractionism that explored the pure elements of visual art such as lines, colors, and geometric shapes like circles, squares, triangles, points, among others (Kandinsky, 1996; Wanner, 2010).As Patricia Railing Writes point out "Kandinsky was not seeking for abstraction but for purity of feeling and its absolute harmony with the resonance of colors, lines, and their rhythmical arrangements" (Railing, 2007, p. 19).

In this context, it is imperative that Kandinsky's paintings must be known or recognized by students in art education classes. However, as questioned by Morais (2009, p. 29), "would it be possible to teach visual arts to a non-visual child? How to transform colors, shapes and lines into representations accessible to a person who permanently expresses weakness of the visual function?"

1.1. Art and Special Education

"Art is considered, a 'tool' that can be used by any professional whose work objective is aimed at helping to rescue what is most human, in the human being" (Benetti, 2016, p. 544). Thus, it is considered that nothing can be omitted for anyone with any disability, since the world around it is composed of a variety of colors, shapes, and textures.

In this context, the teacher must learn how to present the art to any kind of student. For those with visual impairment, objects of two or three-dimensional shapes can be used, involving miniature objects and various materials of different textures (Benetti, 2016; Tederixe& Lima, 2018; Tederixe, 2019; Tederixe& Lima, 2020)and possibly of several odors and flavors, as is the case with plastic and flavored tongue depressors that are used by pediatric dentists and commercial children's books that present different scents and textures for kids.

Ribeiro & Soares (2006 apud Benetti, 2016, p. 546)point out that the environment and its forms must be studied and explored from objects that represent it: "The environment and its forms must be studied and explored based on objects that represent them and the study and manufacture of unique piece of art through painting, manipulation and the making of sculptures and handicrafts so that the student can establish connections including among the different areas of knowledge".

Thus, each person can express himself artistically, creating and recreating, telling, and retelling the core of nature, experimenting, representing, and projecting feelings and sensations and, thus, this puddle "transcending its own existential barriers in search of balance, of happiness, of joy" (Benetti, 2016, p. 544). As statedby Souza &Galuch (2016),

> "In Special Education, the work with the discipline of Art should not be different from that carried out in regular education, that is, the student with or without disabilities needs to have access to artistic practice in a systematic way, with theoretical and technical resources and concepts and practice of what is being studied. This can contribute both to your understanding as a protagonist of your compositions, as well as to the learning and development of artistic, expressive, and creative potential" (Souza&Galuch, 2016, p. 3).

Thus, in the case of visually impaired students the tactile books must be experienced, resized, and revised so that they will have greater interaction, knowledge, and recognition of the reality that surrounds them (Souza et al., 2019; 2020; Tederixe; Lima, 2018; Tederixe, 2019; Tederixe& Lima, 2020).

1.2. Tactile perception

Tactile perception is the proximal view that blind people use to discriminate against objects, animals, and people. The development of this perception is essential to allow them to make the relationship between the linguistic sign (word) and the meaning (object). Thus, blind children are unable to put themselves in the first person. It can be observed that generally they respond in the second person. Therefore, in principle, visually impaired children need to be recruited to recognize their body parts in relation to data received from the outside world. Then, when the child begins to be aware of your own body, hence there is a greater acceptance of yourself (Hall,1981; Navarro et al., 2004).

During the period of formal educational learning children (between 6 and 12 years old) are in the process of cognitive development and therefore need constructive stimuli. According toPiaget (1973; 1982), when the children are in the stage of the concrete operative stage, they acquire skills to think logically and, thus, begin to solve the problems from internalized actions originating from the sensory-motor stages and preoperative. It is in his operative phase that the child builds assimilation and accommodation schemes to establish cognitive development.

Thus, the production and distribution of educational tactile material for children with visual impairment (blind or low vision) who are in elementary school has been demanded (Nuemberg, 2010). Tactile books should tactfully translate the visual illustrations in the content of regular books (Souza et al., 2019; 2020). Thus, it is important to compose tactile books with elements that represent drawings, maps, figures, photos, among other resources that are imperceptible to blind children at an early age.

The accessibility of literary material that is relevant to the development of the visually impaired child comes through texts reproduced in Braille (Duarte et al., 2020) or through the recording of talking books (Lima, 2015; Fonseca&Lima, 2020) as well as throughaudio description or contours of the embossed images (tactile book) (Nuernberg, 2010) or reproduction of three-dimensional images (Souza et al., 2019; 2020; Tederixe& Lima, 2018; Tederixe, 2019; Tederixe& Lima, 2020;Tederixe& Lima, 2020).

There is no doubt that the adoption of the tactile book in special schools represents a resource that helps the insertion of the blind or low vision students in the scenario of visual information and concepts. Therefore, the development of such didactic method leads them to learn and build their own knowledge (Nuernberg, 2010, Souza et al., 2019; 2020; Tederixe& Lima, 2020).

As more children with visual impairments start schooling, a growing scenario of demands for specific educational strategies has been created. Therefore, the aim of the present study was to produce and test among congenital blind children the effectiveness of a handmade tactile book that sought to address the Abstract Art that was beautifully built up by Kandinsky.

2. Material and Methods

In July 2018, the research conducted by us was submitted to Brazil Platform - an electronic system set up by the Brazilian Federal Government in 2010 to systematize the receipt of research projects involving human beings Ethics Committees throughout the country.

The study began to be developed after the approval. The research proposal was analyzed by two ethics committees. The first committees substantiated approval was issued on March 26, 2019 by the Research Ethics Committee of the Faculty of Medicine of Federal Fluminense Federal, Niterói, RJ, BR (CAAE: 95988218,0,5246; Number: 3,223,173).

The second committees approved the research on June 3, 2019 by the Co-Participating Benjamin Constant Institute through the Research Ethics Committee of the Faculty of Medicine of Valença (CAAE: 95988218,0,0,5243; Number: 3,365,650). The acronym CAAE means Certificate of Presentation of Ethical Appreciation ("Certificado de Apresentação de ApreciaçãoÉtica", in Portuguese) (Tederixe, 2019).

Additionally, the guardians of the students who participated in this research signed the Free and Informed Consent Form ("Termo de Consentimento Livre e Esclarecido" - TCLE, in Portuguese; Tederixe, 2019). All field research took place between the months of January to August 2019, to: (i) plan and the tactile book; (ii) choosing participants; (iii) preparing the questionnaires; (iv) organize and develop the three workshops.

All stages of our research were carried out on the premises of the Benjamin Constant Institute. This institution representing an important milestone in the school attendance to visually impaired in Brazil, which began in August 1835 with the first official demonstration of interest in the education of people with visual impairments, even at the

time of D. Pedro II, the second Brazilian emperor. However, the service to visually impaired people took place in Brazil about 30 years later with the creation of the then Imperial Institute for Blind Children, currently the Benjamin Constant Institute (Puga, 2016; IBC, 2020).

2.1. Planning and production of the book

For the making of the book's scenario, some technical adaptation rules addressed by Cerqueira& Ferreira (2000, p. 6) were followed:

> "Size: the materials must be made or selected in a size appropriate to the conditions of the students. Excessively small materials do not emphasize details of their component parts or are easily lost. Exaggeration in size can impair the apprehension of the totality (global view); Tactile significance: the material needs to have a noticeable relief and, as much as possible, consist of different textures to better highlight the component parts. Contrasts of the type: smooth / rough, thin / thick, allow adequate distinctions; Acceptance: the material must not cause rejection of handling; Fidelity: the material must have its representation as accurate as possible of the original model; Ease of Handling: the materials must be simple and easy to handle, providing the student with practical use; Resistance: didactic resources must be made with materials that are not easily spoiled, considering the frequent handling by students; Safety: materials should not pose a danger to students ".

The book contains tactile images with fixed elements in relief and other three-dimensional elements that can be removed and placed by the student himself. The handmade tactile book was made with low-cost and recyclable materials to be an educational resource built with accessible inputs (Table 1).

Table 1: Materials used to make the book.

Objects	Materials used
The Clock in the Book's Cover	• Brazilian barbecue stick, expanded polystyrene balls, ice cream sticks (clock pointer), gouache paint (green, red, and orange), thumbtacks.
School and House	• Red corrugated paper, yellow sheet of Ethyl, Vinyl and Acetate (E.V.A, Etil, Vinil e Acetato, in Portuguese), shoe box cardboard, colored bond paper, 40k colored paper, sandpaper.
Bicycle	• Wheel: o-ring, rim, steel ring. Blue / yellow rigid wire, cardboard, black sheet of E.V.A, plastic tube, rivet.
The character of our story: "Peter" Kandinsky	• Plastic doll, fabric scraps, plush scraps and cardboard glasses that represented Kandinsky.
The Kite	• Toothpick, tissue paper, thread for sewing clothes, cellophane.
Electric Post	• Large matchstick, gray gouache paint, nylon thread.
Emojis	• Yellow sheet of E.V.A., push pin, colored cord.
Kandinsky's Works	• Sheets of E.V.A., Brazilian barbecue sticks, cardboard, voile fabric, colored cords, nylon thread, cardboard.

The history and the scenery of the book's tactile images were created by the principal researcher of the present study (the master in Diversity and Inclusion). The tactile images of Kandinsky abstract paintings "Weiches Hart" (1927, from German: Soft Hard), "Color Study: Squares with Concentric Rings" (1913) as well as the tactile adaptation of the cover inspired by the work "EinigerKreize" (1926, from German: Some Circles) that are available in: www.wassilykandinsky.net and www.wassily-kandinsky.org.

2.2. Research participants selected

First, we had a positive response from the art teacher regarding active participation in applications and analysis of the built tactile book. Second, the five students participating in our research should be regularly enrolled in the first phase of elementary school at Benjamin Constant Institute, being between eight and twelve years old and have no other impairment besides congenital blindness. Congenital blind is those who completely lose their vision before reaching the five years old. On the other hand, those who lose their sight after that age are considered adventitious blind. (Nunes & Lomônaco, 2008).

To remain anonymous of the participants, they were identified with the first five letters (**A**-**E**), being: **A** - Gender: male; ten years old; he never saw and had already heard about colors; **B** - Gender: female; ten years old; had low vision until the age of five with severe progressive vision loss, and she reported that she had a memory of colors; **C** - Gender: male; ten years old; asked the teacher if the combination of colors could result in other colors. The teacher replied that the combinations can generate secondary colors; **D** - Gender: female; ten years old; **E** - Gender: male; nine years old; he explained that he started to like color because of a television program.

2.3. The questionnaires

Data collection and analysis were carried out in two ways: (1) semi-structured pre-tests containing answers in a dichotomous format (yes or no) to know the profile of the students; (2) post-test applied to know the impressions that the students had about our book.For the art teacher involved in the study, a semi-structured questionnaire was elaborated with ten questions having three options: Disagree; Partially Agree, and Agree, based on the scale created by Likert (1903-1981) which was published in 1932 and are widely used in social and educational research until today (Barnette, 2000; Dalmoro& Vieira, 2013; Pereira &Puggina, 2017).

2.4. The workshops

Two workshops were held to test the book. The third workshop encouraged students to participate in manual activity based on Kandinsky's art, having visual arts teacher

as acting as mediator (Table 2).

Table 2: Description of the workshops held at Benjamin Constant Institute.

Workshops	Description of the workshops
I	- The art teacher presented the books to the students and explained to them that the book approach geometric and abstract shapes. All students knew the Braille System.
II	- The students were asked about their research on Kandinsky, using *emojis*.
III	- After the students experienced the abstract movement and Kandinsky's paintings, the teacher revisited the subject of the tactile book "Art in the forms", so the students could point out what they assimilated.

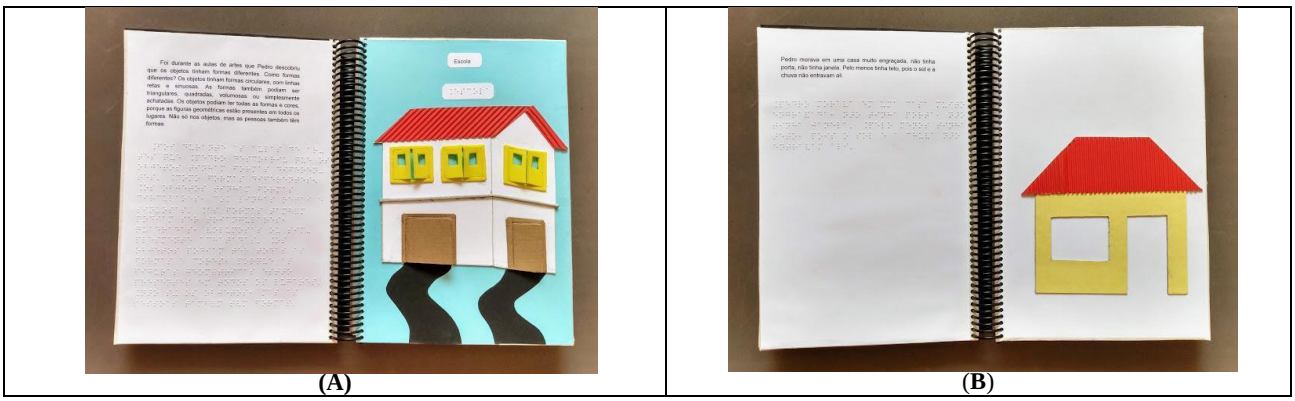
The use of emojis during workshop II enabled students to observe the shape of their faces and create some characteristics for the faces with modeling clay. Currently, emojis are made up of drawings and symbols related to emotional expressions (Paiva, 2016).

3. Results and Discussion

We will present the significant results from a research that aimed to adapt visual images in tactile objects for a haptic reading made by congenital blind students. The tactile book is an intrinsically more complex and fascinating element because it can be a carrier of a message or a vast value system (Alfano, 2013). The construction and didactic exploration of it favors the cognitive evolution of children with visual impairment (França-Freitas & Gil, 2012; Souza et al., 2019; 2020; Tederixe & Lima, 2018; Tederixe, 2019; Tederixe& Lima, 2020).Through comparative analysis of our results, we found that in view of the condition of congenital blindness it is extremely important that such artistic stimuli are initiated in the early stages because "it is important that he uses all possible resources to form his own conceptualization of objects, either through their experience, or through the mediation of knowledge by other people" (Morais, 2009, p. 33) such as art teacher.

3.1. The scenario of the book

The produced book is divided into two parts: The first part suggests everyday images of the students' experience so that they are familiarized and can relate objects to geometric figures (Figures 1A and 1B; Figure 2). In the second part, two works by Kandinky were adapted: Some Circles (1926) (Figure 3A), Soft Hart (1927) (Figure 3B), Color Study(Figure 4A). Squares with Concentric Rings (1913) (Figure 4B).



(A) **(B)**

Figure 1: (**A**) Photo of the book illustrating the school (Text in Portuguese and Braille: It was during art classes that 'Peter' Kandinsky discovered that the objects had different shapes. Like different shapes? The objects had circular shapes, with straight and sinuous lines. The shapes can also be triangular, square, bulky, or simply flat. Objects could have all shapes and colors because geometric figures are present everywhere. Any objects but people have theirs shapes.); (**B**)Photo of the book illustrating the house (Text in Portuguese and Braille: 'Peter' lived in a very funny house, he did not have a door, he did not have a window. At least he had a roof because the sun and the rain did not get in there.).

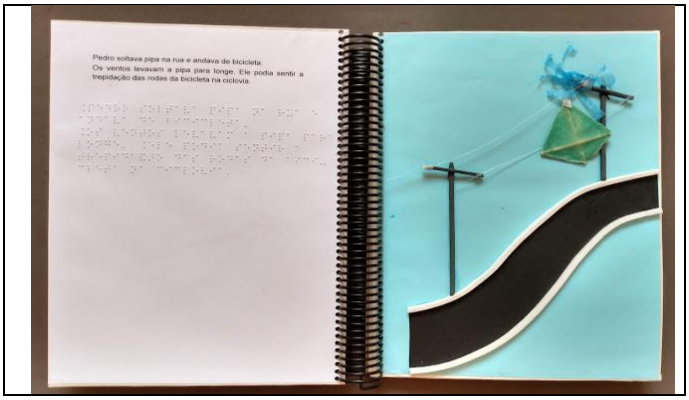


Figure 2: Photo of the book illustrating the bike path (Text: Peter flew a kite on the street and rode a bicycle. The winds carried the kite away. He could feel the bumping of the bike's wheels on the bike path.).

Figure 3: (**A**) Soft Hart. (Source: www.wassilykandinsky.net/year-1927.php). (**B**) Tactile adaptation of the Soft Hart paint.

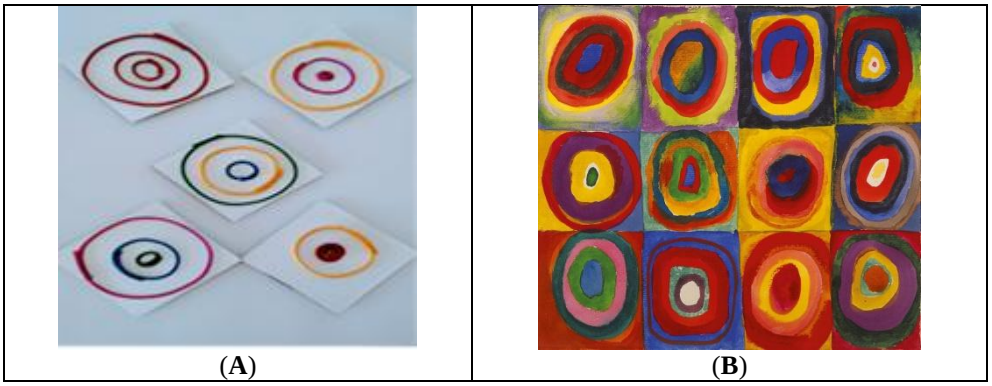


Figure 4: (**A**) Color Study. (Source: www.wassilykandinsky.net/year-1913.php). (**B**) Squares with Concentric Rings.

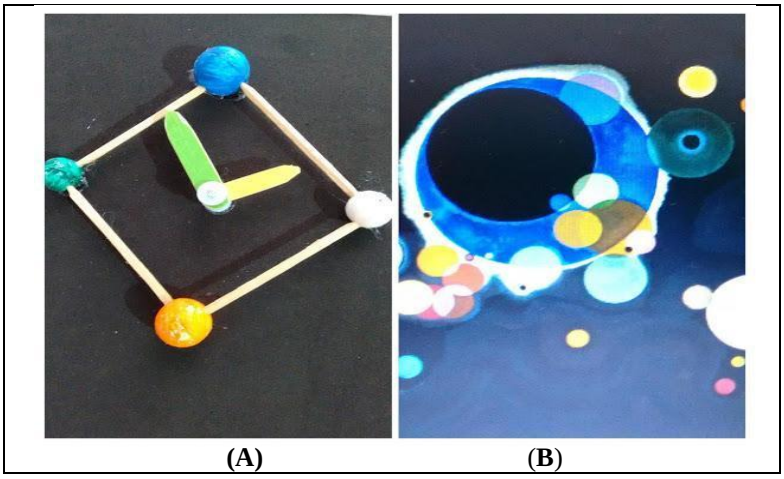
3.2. The written part of the book

A tactile book can have text or be composed by only images that tell the story of the book. When the tactile book is composed the written part should preferably be on the left side for reading in the Braille System and the tactile images are arranged on the right side to facilitate the haptic reading of the figures. An identical copy of crated book was made so that the circulation of the book among the students was facilitated.

However, the important thing is that the text in ink and in Braille are always on the same side of the pages that were initially placed, and that the Braille script is reviewed by a blind person who has mastery of Braille. However, if the tactile book contains short texts (phrases or words) they can remain on the tactile image's own page. Finally, the story of the book must be in accordance with the intended age group, just as the images must correspond with the story (Vecchiarelli, 2010; Souza et al., 2019; 2020; Tederixe&Lima, 2018; Tederixe, 2019).

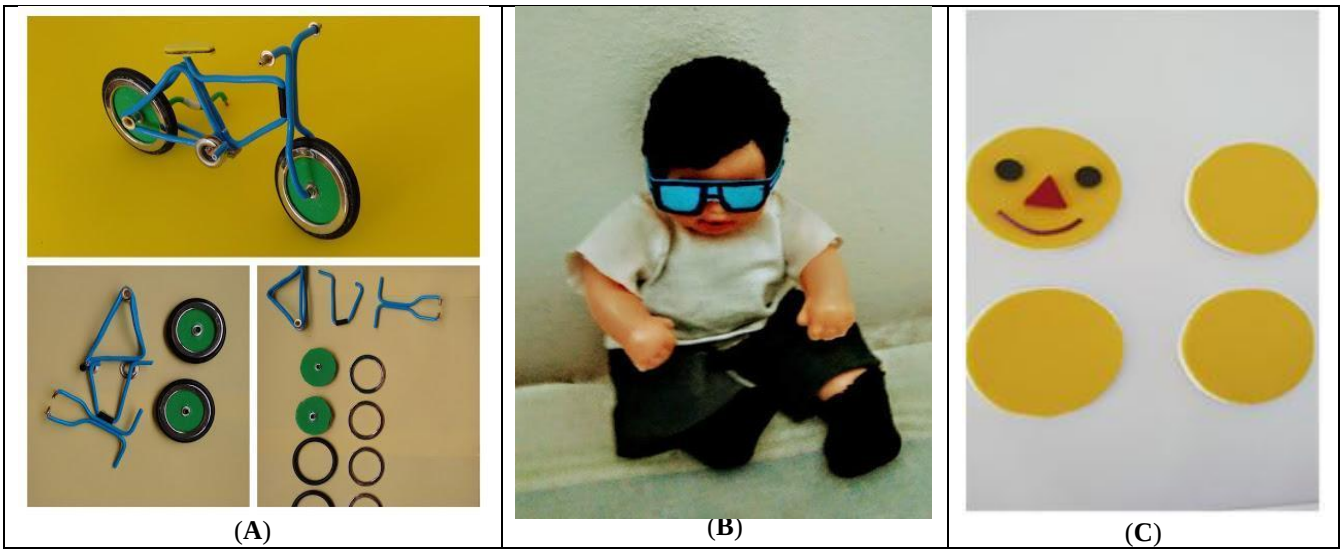
Vecchiarelli (2010) point out that the technical characteristics in the production of tactile books differ from ordinary books, as for the text written in enlarged ink (for people with low vision) and in the relief illustrations with textures varied and a binding that allows closing the book for blind people. The tactile book created and handmade was named as The Art in Forms.

The following figures shows the tactile book cover in clock format and the painting Several Circles (Figures5A and 5B), the photo of the bicycle and its mounting parts (Figure6A), our character ‘Peter’ Kandinsky (Figure 6B), and photos of circles to build up the emojis faces (Figure 6C), and four pictures showing the participants' hands in haptic reading of the tactile images from the first stage of the book *The Art in Forms* (Figure 7).



(**A**) (**B**)

Figure 5: (**A**) Clock-shaped book cover, (**B**) Painting Work Some Circles. (Source: www.wassilykandinsky.net/year-1926.php)



(**A**) (**B**) (**C**)

Figure 6: (**A**) Photo of the bike and its mounting parts. (**B**) 'Peter' Kandinsky. (**C**) Photo of circles with face for the kids to build up emojis.

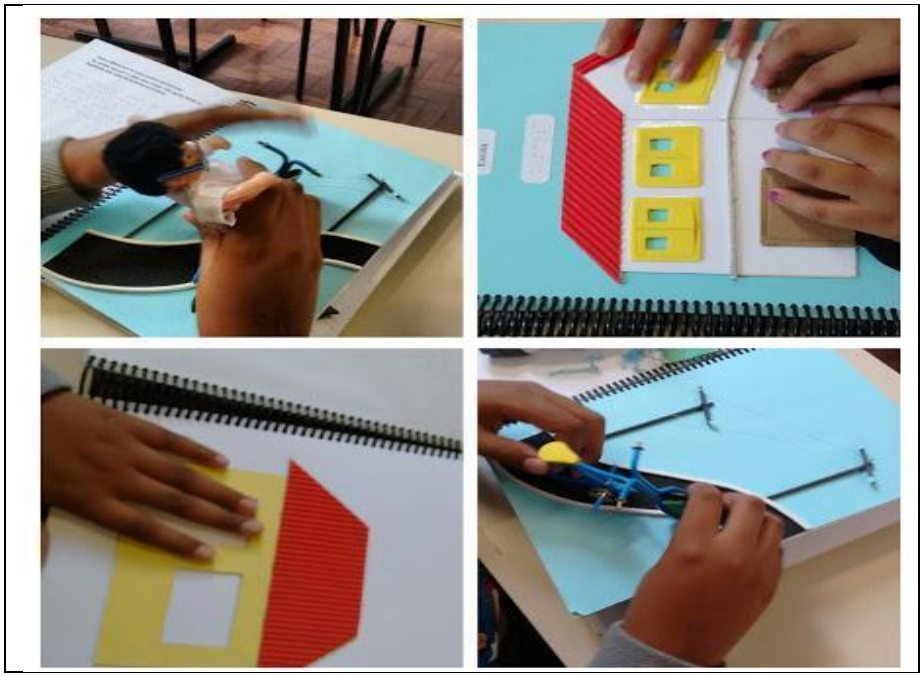


Figure 7: Four pictures showing the participants' hands in haptic reading of the tactile images from the first stage of the book *The Art in Forms*

The recreational activities with emojis where it was very profitable (Carlos et al., 2019). The didactic material must be selected and adapted according to the content to assist the learning process, either to inform, reinforce, memorize, contextualize, understand, or decontextualize (Zabala, 1998).

3.3. Pre-Test Questionnaire

The pre-test was applied to assess the participants' previous knowledge of what is a tactile book and art and who Kandinsky was? We noticed that not all participants knew colors or a tactile book. Additionally, none of the participants studied painting or knew Kandinsky (Table 3).

Table 3: Pre-test results applied to students.

Questions	Answers (%)	
	Yes	Non
1. Do you like books?	100	0
2. Do you have a book at home?	100	0
3. Do you know a book with textures that you can touch and remove the figures from the book?	80	20
4. Do you know the geometric figures such as: triangle, rhombus, rectangle, circle, square?	100	0
5. Do you know the colors?	80	20
6. Have you ever had a book that talked about Arts?	80	20
7. Have you ever been to a museum?	100	0
8. Have you heard of the painter Kandinsky?	0	100

3.4. Workshop I

While reading the book some asked the meaning of certain words they did not know. When a student finished reading Braille and tactile images on a page in the book it was passed on to the next student.The teacher of art returned to the concepts of geometric figures and related the shapes of the objects to the students' own bodies. Students should have to discover the differences between the shape of the house and the school, the elements that were missing in the house (doors and windows) and how they would be represented in geometric figures, as well. They would have to observe the ways in which they appear in external environments such as urban elements: streets, electric poles, among others.Finally, the teacher asked students to do research on the painter Kandinsky´s life since they knew nothing about him. At first, his name generated strangeness to the students and an extreme curiosity. Then, they wanted to know about the country he was born from among other questions.

3.5. Workshop II

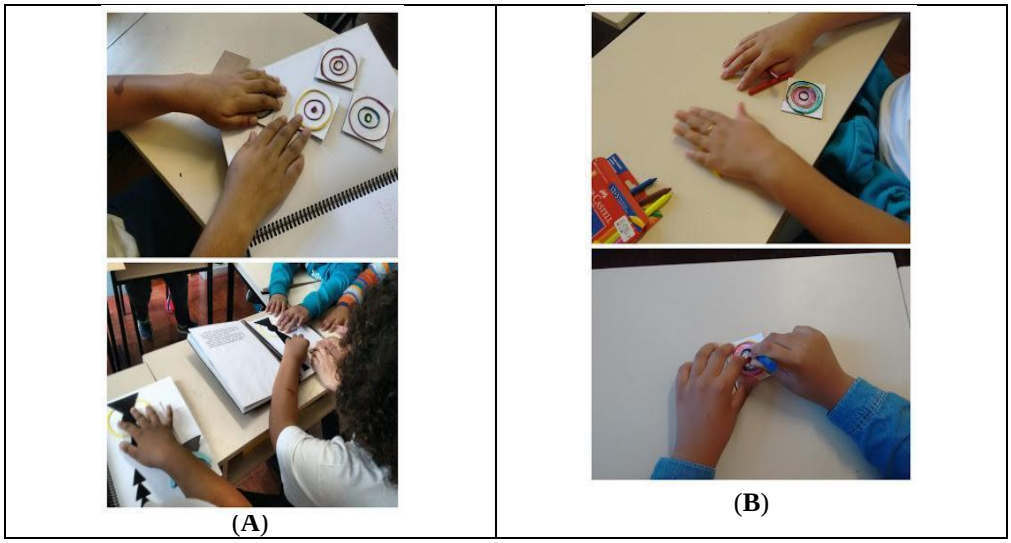
Only two students did research on Kandinsky's life. The student B brought a text printed in ink from the internet and told the other participants about the painter's personal life and a little about the Abstractionist Movement. The student C brought a text written by him, in Braille, and read his more detailed research on the private and professional life of the painter and on the other artists participating in the Abstractionist Movement. It is especially important that the teacher exercises the individual student's autonomy in research to better understand the subject he is learning (Freire, 1996). In this workshop, Kandinsky's paintings were approached, and the students could do some activities using our tactile the book (Figures 8A and 8B).

3.6. Workshop III

The art teacher revisited the subject of the tactile book Art in the forms and the students pointed out the contents they assimilated. We found that the topic in question was still alive in everyone's memory. The art teacher explained about the forms found in nature and with asymmetrical and irregular shapes related to impression of movement that are present in everyday life.

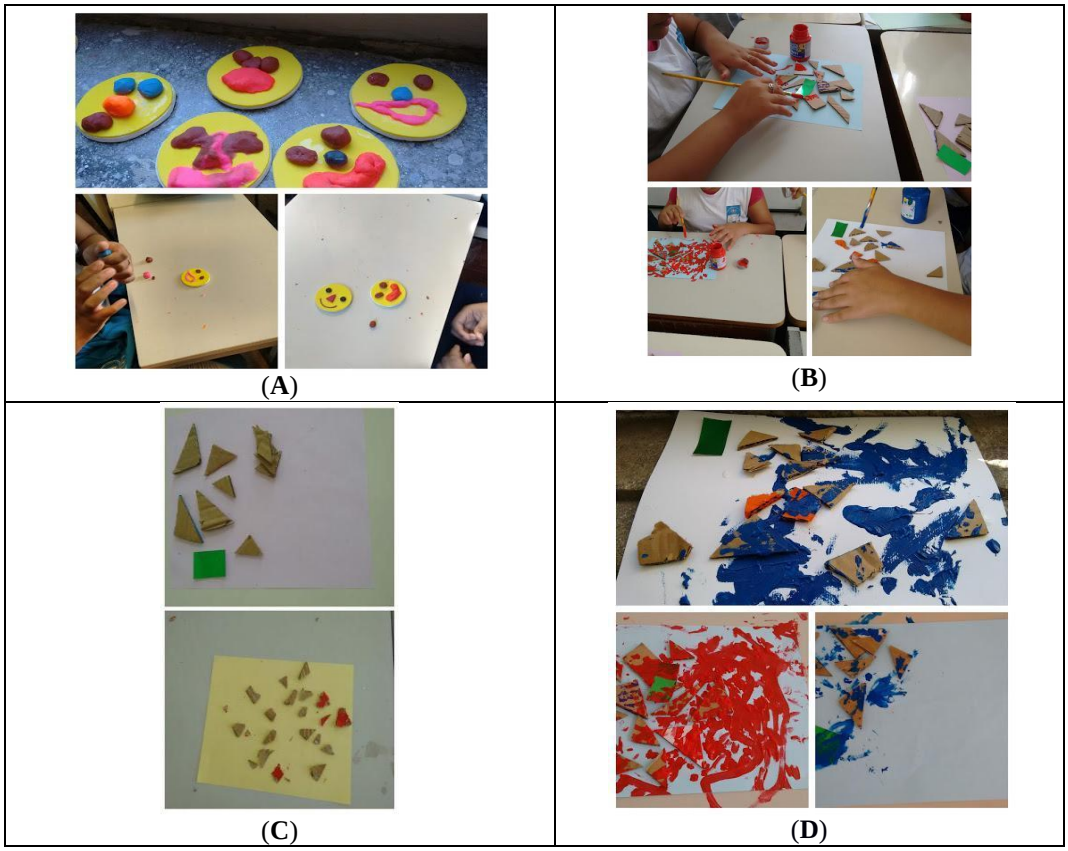
First, she distributed some forms to the students and asked them to select one and report what they had noticed. Student A saw the rough and smooth textures in organic forms. The student E said he had a line. Then, each student identifies the form they have chosen.Second, the teacher distributes colored papers, and each student could choose their favorite color. Some geometric figures cut out of cardboard. They also received inks so they could paint. These geometric shapes could be remodeled by the students in the formats they wanted (Figure 9 A-D).

The students A, B and E chose to make an abstract painting composition using geometric shapes with contrasting colors (Figure 9D) “however, for a creative product to be generated, knowledge and technique are not enough. It is necessary that the individual also develop skills associated with creativity, such as flexibility, originality, sensitivity to problems and imagination …” (Alencar&Fleith, 2003, p. 48). Thus, we observed that in an environment favorable to creativity and free expression, three of five students were able to build their own artistic compositions. Then, we could verify that the activity “… will contribute to having a good and enjoyable life. Creative thinking can also become a lifestyle, a personality trait, a way of regarding the world, a way of interacting with others, a way of working in groups, and a way of living and growing. Living creatively means developing your talents, tapping your unused potentials, and becoming what you are capable of becoming through interaction with other people” (Vidal, 2010, p. 406).The student C cut the geometric shapes, reducing them to some new shapes (Figure 9A). while the student D used the three-dimensional feature in the composition of geometric shapes (Figure 9B).



(**A**) (**B**)

Figure 8: (**A**) Two pictures showing the students handling Kandinsky's adapted paintings. (**B**) Two pictures showing the moment of activity of the book in Coloring circles and square.



(**A**) (**B**) (**C**) (**D**)

Figure 9: (**A**) Two pictures showing the students handling Kandinsky's adapted paintings. (**B**) Sequence of three pictures showing students painting their own compositions. (**C**) Two abstract composition photos taken by student C. (**D**) Three abstract composition photos taken by student D

3.7. Teacher's considerations about the book

We verified that our tactile book "The Art in the Forms" reached 95% acceptance as a didactic resource into the visual arts area (Table 4). According to the art teacher involved in the present study:

"The book presented the content in a playful and simple way, enabling a meaningful tactile experience, relating everyday situations to aesthetic perception. The book also brings an important characteristic of artistic initiation in the first years of school life of the student mainly of the visually impaired person. The systematic study of visual codes (shapes, lines, colors, and others) offers formative and informative support for critical and reflective actions that must be considered in the context of society. Note that the tactile book is a good mediation tool that is not exempt from other teaching methods."

Table 4: Post-test results to access students' evaluation of the book

Questions	Answers (%)	
	Yes	Non
1. Did you like the tactile book?	100	0
2. Did you find it difficult to recognize the figures in our book?	0	100
3. Did you already know some of these figures that were in the book?	80	20
4. Did you notice the texture differences in the book?	100	0
5. Did you understand the story of the book?	80	20
6. Is it important to have books with art made by painters so that you can touch and get to know them?	100	0
7. Did you find it interesting to know Kandinsky's paintings?	80	20
8. Would you like to create paintings just like Kandinsky?	100	0

3.8. Additional observations

In Workshop I, students had to do a haptic reading of the images proposed in the first part of the book (Table 5). Some tactile images were immediately identified because they were part of the students' prior knowledge while others had more difficulty or were totally incomprehensible.

Table 5: Haptic reading of the images

Images	Not identified	Identified with difficulty	Identified
Watch	C	A	B D E
School			A B C D E
House			A B C D E
Bicycle			A B C D E
Peter			A B C D E
Kite			A B C D E
Electric post	A B C D E		

On the cover of the tactile book there is a watch that was not identified by two of five students: the student A identified that the clock pointer as a helicopter propeller and the student C was unable to answer what could be. The students needed the teacher's interference to identify the electric poles because they did not yet have a tactile experience with these types of elements. Therefore, the mediation of teacher was essential for them to understanding the objects in question, as point out Fernandes & Healy (2004).

The teacher explained to the students that the poles were small-scale representations of their original shape, as the drawing has no need to represent the real size. Cardinali& Ferreira (2010) mentions that the blind child need recognizing drawings in relief. This will allow him to have access to a universal code used for communication between people. For Valente (2009), the recognition of drawings in relief will depend a lot on the life experiences of each blind person. In this sense, when the blind child is taken to carry out the haptic reading of the relief drawings, he is automatically being literate in the reading of tactile images.The two-dimensional images (the school and the house) are part of the common universe of the participants so it is easy to identify, especially when the same type of texture was used on the roofs of the images, as expect Romani &Henno (2017).

The bicycle, the kite and the character ‘Peter’ Kandinsky brought a surprise effect to the students, which made it possible for the students to interact with the tactile book. At that time, the book was not only meant to teach but also to play. In other words, for participating students to read a story and handle a book are fun ways to learn. The playful instruments in children's books encourage their interest in providing emotions, stimulating the senses, and concentrating the child's energy in manipulating the object, thus helping in its emotional and cultural development (Romani, 2011).

Like any other book, a tactile book is conditioned to technical standards of book production, that is, to the physical characteristics of the book (Souza et al., 2019; 2020). Thus, that kind of book must present different textures, easy handling and acceptable to the touch (Nuemberg, 2010). Therefore, it was done in the book The Art of Forms with several three-dimensional tactile elements: bicycle, kite, ‘Peter’ Kandinsky, among others.

During the Workshop II, the students read had an haptically contact which Kandinsky's abstract paintings. The post-test showed that most readable for students to understand. In the painting Color Study: Squares with Concentric Rings, all students identified the circle and square shapes of the composition and compared them to a spiral (Table 6). The teacher explained that the work is colorful and that within a color palette and they can be classified into warm and cold colors. The most vibrant shades are warm and the neutral colors cooler.

In the study of colors, each one differs in four shades: warm light or dark; cold-light and dark and there are still contrasts: black and white. Based on this explanation, the students decided to choose colors by warm or cold tones. Some chose blue because it is a cold color and others chose shades of red to represent the hot. One or the other wanted to mix the hot and cold tones.

Table 6: Haptic Reading of Kandinsky's Works.

Images	Not Identified	Identified with Difficulty	Identified
			A B C D E
	A B C D E		

For Kandinsky (1996, p. 67), “there are colors that look rough and hurt the eyes. Others, on the contrary, give the impression of smooth, velvety [...]. This is the sensation that produces the difference in the color tone, between warm tones and cold tones.”

During Workshop II and after answering the questionnaire depicted in Table 6, we observed that some students were aware of colors and 'visionary artists' interventions and associated colors with some element of nature.

According to Bastos, Fedrizzi &Guimarães (2004), the congenital blind child understands color as abstraction, having the need to establish a concrete contact as much as possible. That is why they learned to relate colors with texture and objects existing in nature. Congenitally blind people can perceive the tonal difference in colors (light/dark) and the association of temperature (yellow-hot/blue-cold).

In the painting Soft Hart, the students interpreted the composition of two inverted triangles, an image adapted in the shape of a sailboat as if they were a butterfly wing. Dondis (1997) clarifies that the Abstract form transmits the symbolic meaning that passes from the conscious to the unconscious. This occurs through lived experiences in the sensory field that are linked to the nervous system through tactile perception.

During the mediation, the art teacher explained to the students that is the Abstract Art. She said that we must build forms out of our imagination as many objects that exist in our daily lives have emerged because someone imagined them. This happens through creative thinking that uses and recreates compositions of geometric shapes and lines – an activity necessary to understand the images of greater complexity (Tederixe&Lima, 2018; Tederixe, 2019). The intervention of an instructor/teacher in a learning situation and their attempts to favor the planning of learning activities is especially important (Fernandes& Healy, 2004).

We verified that the students were able to identify the geometric shapes made by E.V.A. Although the circle made with nylon was also somewhat incomprehensible to the touch (Table 6). The visually impaired children do not appropriate information in the same way as a 'seer' child, as he needs to compensate for the lack of vision with other senses (olfactory, tactile, auditory) to decode a text or when they are unable to make a visual reading of the image (Preto, 2009).

In Workshop III, students were able to expose what they learned about the Abstract Movement and represented it through the creative process by giving form to the compositions. The creative act is an existential nature action that starts from our experiences and our ability to configure shapes and distinguish symbols (Ostrower, 2001).

In the Workshop III, the students were able to exercise creativity based on knowledge built from the concepts of geometric shapes, colors, and abstract compositions. The Abstract Art allows freedom of artistic expression in the sense of being able to appreciate and interpret the paintings in a particularly unique way without being obliged to follow the reality of the facts as seen in Classical Art.

Arts activities in the early years of teaching should promote pleasurable moments which provoke in the child the desire for discovery, manual flexibility, dexterity, creativity, production, and reflection, in which different materials can be explored. Through the act of creation, art promotes the child's integral development in the intellectual, emotional, aesthetic, physical, social, perceptive realm, favoring the expression of feelings, emotions, desires, promoting their personal and social autonomy; and even more, art, in its innumerable expressions and through different materials. Art can provide children many moments of joy and pleasure. It might provoke in them the desire for creative and reflective discovery with the improvement in dexterity and manual flexibility (Ujiie, 2013).

We found that during the bonding activity, the children released their emotions and fantasies, demonstrating that each of them experienced an exchange with themselves and with the world (Jacó-Vilela & Sato, 2012). Depend on the art teacher to understand, stimulate, and create an environment that enables the creativity of each child. Moreover, is important that the art teacher has clarity in the objectives in promoting free activities that are fundamentally liberating (Ujiie, 2013). Puga (2016, p. 825) states that "if in the past the experience of blindness was synonymous with exclusion, inferiority, marginality and misery, in modernity this conception gains new nuances due to the liberating perspectives" that pass through the special education that must overcome several challenges (Whitburn, 2014), always involving teacher training, the development of inclusive pedagogical projects and the flexibility of the curriculum, among others.

4. Conclusion

The most important thing in handmade a tactile book is that it is functional, and for that it is essential to the continuous participation and testing with the students to which it is addressed. During the tactile book testing, students involved in this study were able to read in the Braille System and haptically to explore the images and use geometric figures in the most diverse contexts in the Visual Arts class. The evaluation of the book product (*The Art in Forms*) met our expectations. Thus, it is believed that it will be able to assist with the didactic activities of Visual Arts teachers whose mission is to include visually impaired students in the field of art through tactile adaptations of works by great artists.

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