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Chapter

Facilitating Accessibility: A Study on Innovative Didactic Materials to Generate Emotional Interactions with Pictorial Art

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Abstract

This research has been undertaken to establish criteria for the construction of didactic materials to be experienced through touch (using a three-dimensional model) and hearing (through the provision of an audio description of the chosen painting) to provide learning and emotions. Eleven experts examined the didactic tools in which the scene of the painting had been depicted, through the use of white plastic figures modeled using a 3D printer. The models had been positioned to accurately correspond with the reference painting, with an explanatory narration supplied as an audio recording. Each of the experts involved were asked the same open questions in interviews that were audio-recorded and later transcribed. This feedback was analyzed and eleven concerns for consideration were determined: 1. How the figures felt to touch 2. Modeling and placement of the figure, 3. Position of the character, 4. Size, 5. The accurate 3D depiction of the 2D image, 6. Perspectives or visual points of view of the scene, 7. Enough representation of the painting in the model, 8. Distribution of visual components within the scene, 9. Perceptual appraisals, 10. Size of the model, 11. Touch of the whole model. The results indicated that the size of the model and the figurines was appropriate for their function. The figurines felt pleasant to handle and adequately described the postures and placement. Suggestions for further improvements were including more figurines in the model and adding color (omitted in the test model) to belong an inclusive design.

Keywords: emotion, didactic of the art, painting, teaching material, new technologies, accesibility

1. Introduction

It is assumed that there is an inherent ability in each person who has the benefit of sight, to be able to appreciate the esthetics present in visual works of art and that it is this capability that provokes an emotional response to a picture. This being the case, visual art can be described as a tool for communication, involving a message, a transmitter and a repeater, the communication existing as a channel of perception that flows between the three, responding to esthetic influences normally related to beauty. An artist often aims to leave an impression upon the viewer, who may

respond through intelligence and emotions, the outcome being an esthetic effect that leads to the perception of the subject in a particular way. Thus, the subject of a painting may be described by the viewer to be beautiful, pleasant, surprising or interesting, for example.

Though this method of transmission, visual observation, is the same for all sighted persons, viewers frequently respond differently - to a greater or lesser degree - to an image, due to the influence of an individual's subjective responses upon the objective elements. Thus, artistic sensitivity lies at the intersection of expression involving sensorial elements (color, form, sound), and the ability to make value judgments on the beauty and meaning present in the work, reasoning about the artist's intentions and the characteristics of the artistic period, etc. On the other hand, less sensitive or informed observers experience a more superficial appreciation: the work of art communicating nothing in particular to them, nor affecting them emotionally. It is these subtle complexities and the widely recognized impact of art upon human life that determine the need for education in esthetic appreciation, through which the tools and framework for perceiving and interpreting works of art can be learned.

1.1 Pictorial art and esthetic emotion

Based on common interests concerning how art affects human life culturally, psychologically and emotionally, numerous attempts have been made to systematically measure its influence. It could be stated that the main objective of a work of art would be to provoke an artistic experience in the viewer [1], based on the fact that an esthetic experience is provoked by perceptual impressions [2]. Of course, not every work of art will provoke an esthetic experience, nor may even have been designed for such a purpose. However, the personal benefits to be gained through engaging with art, familiarity with the effects of visually-rich stimuli ought to be nurtured through educational processes designed to lead to the discrimination of stimuli and the subsequent implementation of analysis processes.

It is both helpful and convenient to differentiate concepts such as art, esthetics and beauty, since they are basically related but they are separated in their particulars. Marty [3] starts from said reflection, finding difficulty in defining these concepts, for which the establishment of ways of differentiating the esthetic from the non-esthetic is advocated. On the other hand, these researchers consider that the esthetic experience, of perceptual origin, as mentioned above, is fundamentally related to art and beauty although this relationship is not always the case. For example, historically, beauty has often been linked with the desirable and the excellent. In direct opposition to such a correlation, there are artistic currents such as "ugliness" that seek to move away from the reliance on beauty to create appeal for artistic creations. Despite this, there exists a series of universals in esthetic judgment, that is, the consideration of something as being beautiful, based on the intimate relationship between form and content [4, 5].

Bernard and Chacuiboff [6], reviewed works on esthetic sensitivity, drawing attention to the fact that the first tests carried out in the 1940's were based on the judgments of experts in artistic matters, compared with those of other non-specialist individuals. Based on the study on esthetic appreciation by Burt [7], significant correlations were found in the judgments of the subjects observing works of art, which led him to suspect certain universals in these cognitive functions. Eysenck [8] conducted a more rigorous study and again found that there was a "general factor" of esthetic appreciation. He later found (in 1972) [9] a peculiar personality in artists, compared to non-artists, regarding vocabulary, due to their formation. In contrast, there were no differences regarding perception, or what he

called "esthetic sensibility "between expert and non-expert observers of art. Further, Seifert [10] concluded that a basic knowledge of art is also evident in people with little or no formal education in art or esthetics.

1.2 Elements of esthetic appreciation in pictorial art

The present study is based on the demand for adaptive tools to help the visually-impaired to access the plastic arts, specifically painting. Graeme, McLinden, Farrell, Ware, McCall and Pavey [11], in reviewing the concept of learning accessibility in schools, describe the varying implications of teaching at various levels: whether practical sessions during classes, special educational needs methods of teaching or curricular adaptations, in addition to professional training and interprofessional coordination. They recommend that accessible materials should be used for any special educational needs student, since this will also benefit the rest of the classmates. There is evidence to show that both approaches are important, but teaching children access skills has important longer-term benefits for visually impaired children and young people. In spite of this evidence, it appears that this approach to teaching may often be neglected.

Salzhauer et al. [12] offer a series of guidelines for museum educators and art teachers to employ, in order to further develop visual descriptions for the benefit of the partially-sighted. These guidelines include giving standardized information on the author, the title of the work, the subject, shapes and colors, as well as technique and style. They advise using vocabulary suitable for the blind, (avoiding figurative words) and encourage attention to be drawn to vivid details and the work's location in the museum. This is in addition to adopting the use of other senses in order to develop analogous explanations of intangible concepts through alternative representations, together with the provision of additional information, such as the historical and social context of the work. The creative use of sound is specifically recommended, likewise, touching works of art or substitute materials, and using tactile diagrams. These same authors proposed guidelines for the creation of tactile diagrams and for the writing of oral narratives that accompany them. In this way, partially-sighted observers are provided with the perceptual information necessary to have full intellectual access to the history and culture of our world, as depicted in art.

This study follows the guidelines proposed by Salzhauer et al. [12] for the preparation of such pedagogical intervention material. Included are just a few of the examples that have been devised to better demonstrate the art works exhibited in museums, for the benefit of people with visual disabilities. Each of the didactic constructions take as their starting point the need to adapt the paintings by means of the inclusion of tactile diagrams presented with narrated descriptions, with the aim that visually-imapired people can have improved access to the original work.

Another area of approach to works of art is to introduce an explanatory narrative that moves beyond mere description of the visual work. The genre of "ekphrasis" is the written description of visual works so that they are better understood by the viewer or those unable to see them. It is a highly contested practice conceptually, since the person listening to or reading the ekphrastic work would actually be subject to the impressions of a third party, the author. These "narratives" have been extrapolated into other artistic fields, such as explaining paintings. It is very common that the paintings are explained through a description. Authors like Monegal [13] defend that literature is verbal and temporal, while painting is plastic and spatial, therefore, they belong to inherently different fields and are therefore difficult to reconcile. For this reason, Monegal [13] encourages the search for other techniques of representation of plastic art, not restricted to the narrative of a

painting. This has led the interest in searching for tactile materials that exploit new technologies.

1.3 New technologies at the service of didactics in art education

The advances brought by new technologies have been gradually introduced in the teaching of art. A good example within literature is the "Daisy book" by Ribere and Moese [14]. This innovative proposal for a multimedia book integrates text, sound, images and videos in a practical and synchronized way, with an audio narrative heard while browsing through the text. In addition, the reader can activate videos that are embedded in the programming of the book. Created using DTBook xml, (DTB = digital talking book), the format allows the author to simultaneously present audio and visual formats within one tool. While the DTBook xml format has the potential to be a valid alternative to other digital publishing formats, its viability is questionable. This is due to the excessive economic investment required per publication, at this time, and potential problems regarding the rights relating to digital reproductions.

There are general criteria to be applied when devising the production of didactic tools. These were established by Artiga [15]:

- The educational objectives must be the starting point, when considering how a particular material or construction can support the learning process.

- The contents that are going to be treated in the implementation of the material must be considered.

- Didactic tools must be suitable for the end-user. Firstly, the design must take into account the interests, abilities, prior knowledge, experience and skills of those who will be using the materials. Secondly, the materials must be be designed to promote further skills development.

- The characteristics of the application context.

- The didactic strategies to be used must be congruent with the tool.

The contents of a didactic tool, the ways in which it will be employed and any other educational resources that will be used, should be congruently arranged to ensure optimum accessibility. Based on the demand for adaptations to access the plastic arts, specifically painting, researchers such as Graeme, McLinden, Farrell, Ware, McCall and Pavey [11] have reviewed the concept of accessibility in schools and describe implications for the teaching at various levels: practical sessions in classes, specialist teaching, curricular adaptations, professional training and interprofessional coordination. It is their recommendation that accessible materials should be used for any student who has some special educational needs, since this is also likely to benefit the rest of the class.

2. Methodology

This study is based on the need to analyze the convenience of novel didactic material, consisting of models made using 3D printers, which are likely to provoke esthetic emotion as well as learning. These models provide the figurative and spatial representation in three dimensions of the scene and the characters in a 2D painting.

On the one hand, they wanted to assess the quality of materials being designed and manufactured with new technologies, to be used as a didactic instrument in the teaching of art. A series of key parameters had to be explored for proper learning to take place by students using said material.

On the other hand, we had the idea that these printed 3D models could serve as inclusive tools usable by students with disabilities. In particular, those with visual disabilities, who would normally have difficulties in the perception of the space depicted in some works of pictorial art would, through the use of such a tool, be better able to comprehend and respond to the work. We were specifically interested in the 3D representation of paintings in which the use of perspective has been employed by an artist to describe an open space, several planes and distance.

It was therefore important to consult experts so that they could give their opinion on the models, and collate their assessments, offered in conversation. A methodology of qualitative analysis of the interviews was chosen, in order to proceed in a systematic way. The experts commented on whether the material was suitable for learning the contents of the painting and could also arouse emotions. In this way, we would obtain an assessment of the quality of the models as teaching material capable of provoking esthetic emotions.

A qualitative approach was chosen for the analysis of the opinions of the experts who were to review the 3D mock-ups of the paintings. This follows the principles of McMillan and Schumacher [16], fulfilling characteristics such as: collecting perceptions and/or personal points of view, focus on understanding the models as didactic material, data collection strategies adapted to the possibilities of participation, accounting for the subjectivity of the experts, and the level of interaction between researchers and experts during the interview process, given the natural context.

For data collection, the steps recommended by Taylor et al. [17] have been followed. Firstly, various aspects of the work of art have been identified as being necessary to be understood and learned. Thus, in this respect, concepts have been established and theoretical propositions have been reviewed. Based on this, the codification of the data was established through the development of categories. All concepts were listed and classified by subject, assigning a main category that brought together statements and observations that could be included in these general categories. They were reviewed and reformulated until a definitive list of concepts that needed to be understood was obtained.

The data analysis was carried out following the requirements indicated by Rodríguez Gómez et al., [18]: data reduction, data arrangement and transformation, and the drawing and verification of conclusions. Data reduction consisted of categorizations and coding. The categories were separated by phrases that expressed exclusionary content. Following the interviews, a computer program counted the words used, in addition to indicating their position within the text of the transcription.

The analysis focused on the choice of the words used: registering nouns, adjectives, verbs, etc. An analysis of sentences and paragraphs was also considered. It was established that a phrase, fraction of a phrase, or words would be taken if communicated sufficient information and if those were different from the others, discovering the key characteristics that would allow creating a category. The results were analyzed with the technological help of the AQUAD7 program, establishing codes for content analysis.

For the arrangement and transformation of the data, an alphanumeric coding system was used, with each of the concepts listed in the definitive list of categories assigned a number. This made it possible to encode each expression made by the experts when exploring a model.

For example:

Category: Discrimination of the scene of the model.

Subcategory: Parts of the figure that are difficult to recognize.

Expression: "This, here …. mmm … not perceived well … let's see? (He touches it more carefully.) "It may be something he has taken with his hand, … I don't know."

Data categorization: 27.5.

To obtain conclusions, the choice and frequency of vocabulary used, as defined within the categories and subcategories of each table was counted. Thus, the most satisfactory aspects of the model were obtained, as well as those that needed to be modified or rethought.

2.1 Participants

The models were presented, and explanatory content were narrated to 11 experts. Five of those were teacher's specialist in primary school students with visual disabilities. A further four experts were visually impaired educators, and two experts were specialized in art education at secondary schools. The interviewers with the experts were conducted by the same person.

2.2 Process

Three didactic models were each placed on tables, with a printed copy of the painting it depicted. All the experts were provided with a questionnaire that required the same questions to be answered at each table as they examined the models. The experts were able to handle the model without vision (covering their eyes) and afterwards, they could look at the printed copy of the painting if they had visual capability (**Figure 1**). At each station, the researcher narrated information that had been provided by the museums where the artworks are on display, giving information about the main features of each of the paintings. Researchers asked questions of the experts, relating to the models, and audio recordings were made of the answers provided. These recordings were later transcribed in order to analyze the responses of the experts as they examined the didactic models.

The analysis of the experts' responses relied upon the use of phrases or expressions that were sufficiently unambiguous to make it possible to build a framework of categories in order to measure the level of response to each model. The categorization was carried out with the different comments of the experts. Some concepts were defined and some new ones were added. Ultimately, a structure of categories

Figure 1.
Expert exploring the first part of the didactic material to learn paint woks.

and sub-categories was designed, with numbering applied to create a scoring system that made it possible to analyze the experts' responses to the models.

To accurately measure responses to the models, each expression that the experts made, when responding to the models, was counted as a unit of data, identifiable within the framework of categories of expressive responses. The frequency of recurrence of data units was counted to provide a data set that recorded human response, as recommended by Bardin [19]. In this way, verbal expression could reliably be converted into measurable data. So higher frequencies of a particular data unit (expression) denoted a greater importance of that unit. (See **Table A1**).

The categories were reviewed according to the qualities described by Bardin, [19] and Olabuénaga [20], verifying that: they had mutual exclusion (an element could'cannot belong to more than one), were exhaustive (all data could be categorized), were homogeneous (they were consistent within the clear, concrete and precise framework that had been devised specifically for this purpose, divided by the principle of classification of the elements of the model), relevance (the categories were specific to the object of study of didactic material used in art teaching), objectivity and reliability (having been subject to peer-review by several teachers), clarity (understandable content), replicability (another researcher would code the stories in the same way), productivity (frequencies can be found and conclusions drawn).

3. Results

Responses to the models related to a number of considerations, with the most frequently commented upon considerations ranking highest. The data was examined to determine information about each of the three models separately.

Dalí's model (Giraffe in flames, **Figure 2**).

Categorical prominence of most the frequent responses:

1. Details of each figure (clothes, ornaments, elements) (29).

2. Details to differentiate the characters (13).

3. Adequate modeling to represent the painting (11).

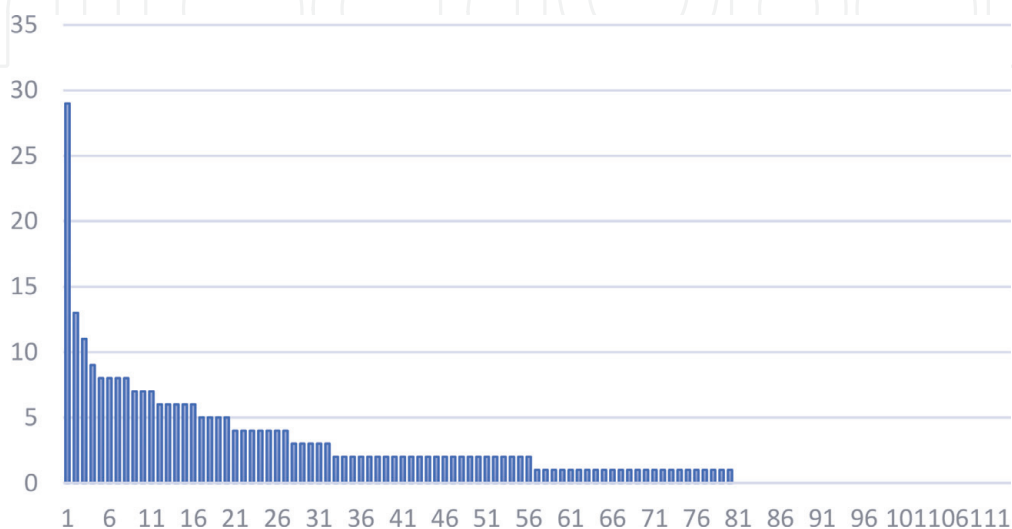4. It is necessary to clarify the meaning of the table (9).

Figure 2.
Frequency of responses by range in the response categories of Dalí's model.

5. The figure is pleasant to touch (8).

6. The texture of the material used to model the figurine is appropriate (8).

7. It is possible to discriminate one part of a figure from another (8).

The Velázquez model received different levels of feedback (**Figure 3**). Categorical prominence of most the frequent responses:

1. Details of each figure (clothes, ornaments, elements) (26).

2. The model is representative of the scene of the painting (18).

3. Explanation help enough to understand the picture (17).

4. Positive feedback received, in general terms, about the model (14).

Listed in order of prominence, the following response categories reflect an intermediate reaction to the model:

5. The figurines and scene were pleasant to handle and touch (13).

6. The figurines were of an appropriate size for this purpose (7).

7. The figures and scene were sufficiently detailed in order to reflect the period in which the painting was set (6).

8. Textural variance of the medium used to model the figurines was noted (6).

The following categories were most prominent in the responses to the Goya model (**Figure 4**):

1. Details of each figure (clothes, ornaments, elements) (21).

2. The model is a suitable representation of the painting (14).

3. Further explanation is required in order to help understand the painting (11).
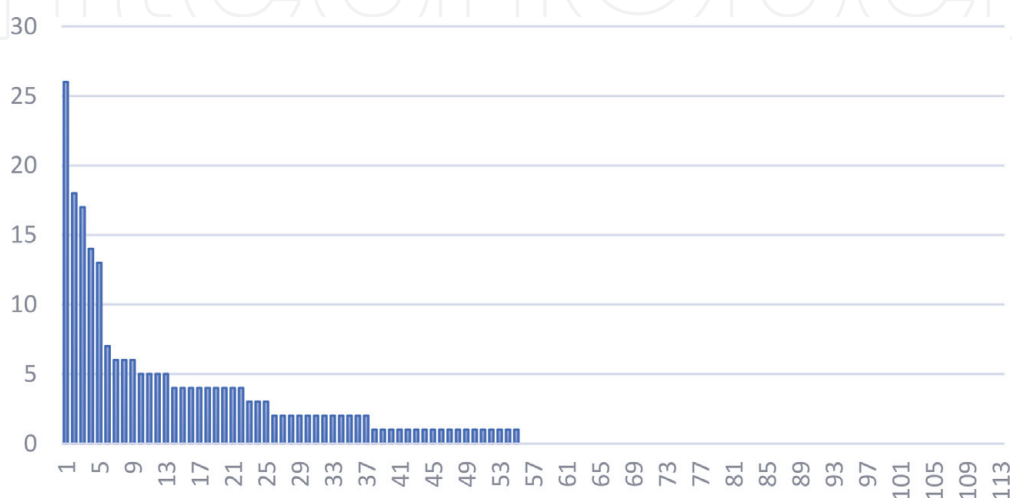

Figure 3.
Frequency of preferred responses in the categories of the Velázquez model.
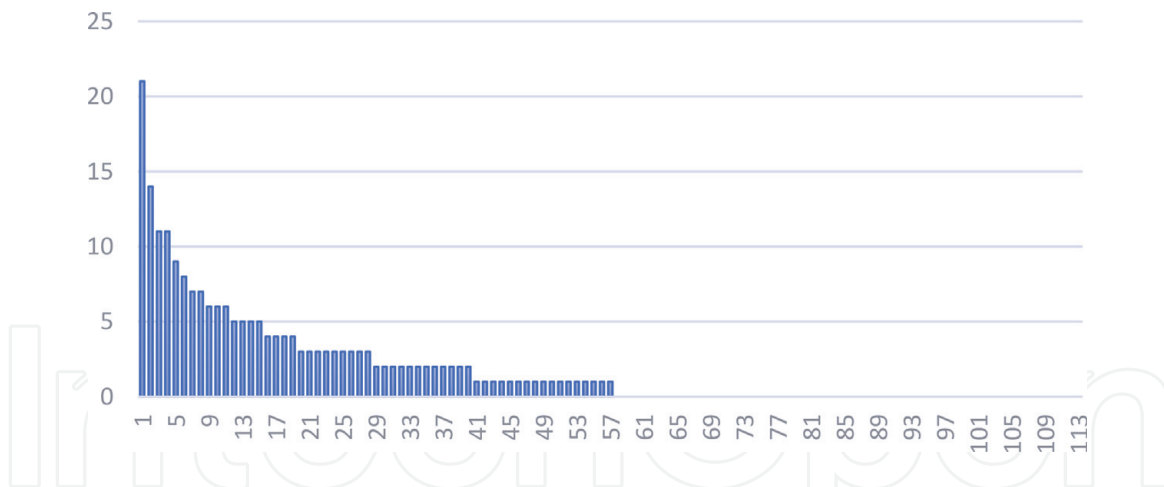
Figure 4.
Frequency of responses by range in the response categories of Goya's model.

4. Positive feedback received, in general terms, about the model (11).

5. The figurines and scene were pleasant to handle (9).

The intermediate scores were.

6. The figurines and scene were pleasant to touch.

7. Details to know the epoch (clothes, wrinkles, ties and other accessories) (8).

8. Details that provide information about gender (clothing, accessories such as hats, ties, etc.) (7).

9. The model is a helpful educational tool for people with visual disabilities (7).

10. Explanation helps to understand the picture (6).

11. Overall positive appraisals (6).

4. Conclusions

This study presents the development of observations made following an initiative to assist visually impaired persons in understanding a visual work of art. In an effort to facilitate an alternative to the visual experience, a didactic tool was created in which the chosen two-dimensional artwork was recreated as a three-dimensional model. "Viewers" were encouraged to manipulate the figures and objects within the construction and an audio description provided in order to comprehend something of the original work. Beyond facilitating an understanding of the appearance of the work, the primary objective of this initiative was to enable visually impaired persons to have the opportunity to respond to the work on esthetic and emotional levels.

The study collected in interviews with teaching experts with a speciality in the field of accessibility to the visual arts for the visually impaired has been useful, following the guidelines of Ballesteros and Mata [21] for qualitative studies in education. This work has been carried out in the field of visual impairment, in collaboration with both technical specialists in visual impairment, together with visually impaired assessors, in other to study the field in detail. However, the use of

didactic models such as these is intended to be transferable to support how other disabled individuals can derive educational and esthetic responses to art, given the inclusive use intended for the models.

Educators will all appreciate that even people who have full use of all their senses can also benefit from these models by deepening their understanding of a piece of visual art through encouraging increased engagement with senses other than the eyes.

The experts have considered the models to be an adequate representation of the pictorial works. They have emphasized that the scene depicted in each of the mock-ups is sufficiently representative of the paintings they were designed to depict, that key details can be discerned, in order to recognize the figures depicted in the paintings, and even the historical context or artistic period. They have expressed positive feedback in their assessments, for example that the didactic models are beautiful, original and practical. In addition, they have highlighted that models are pleasant to touch and are of an optimal size for the purpose of being use as an educational tool to teach an appreciation and understanding of visual art.

Likewise, the experts have highlighted that it is a useful material for the knowledge of paintings for people with visual disabilities since they can touch the main conceptual elements.

Regarding the improvements that they have indicated, they emphasize that a help of an explanation is necessary to understand the table. Appropriate narrations adapted to the educational level, in the sense of the materials proposed by Monegal [13]. They also require the use of color in the figures and the scene to be as close to the painting as possible.

At this point, it must be considered that an artistic reproduction of the pictorial work is not intended, which is far from the didactic objectives, but only an accessible 3D representation. This material aims to be inclusive, following qualitative characteristics such as those indicated by Graeme et al. [11], that is, usable for curricular adaptations of specific students, but for all others and of practical way in the classroom.

They could be used in the museum field, since they comply with the Cioppi [22] guidelines on accessibility to visual impairment, being extrapolated to other characteristics, such as intellectual disability, the elderly, attention disorder, etc. And in the educational field, they could be used, since they meet the characteristics of optimal teaching materials [15].

The narratives should be improved to make them understandable to any student. Following recommendations such as those of Salzhauer et al., [12] and D'Aveni [23] regarding visual descriptions of works of art. It would be necessary to include a tactile guide to explore the models with the hands, accompanied by a narration that refers to the main elements of the works. Thus, it would work for anyone, regardless of their characteristics and would follow the "design for all" of the Stockholm declaration. Some research about it can be found in Carpio et al. [24].

With this study a descriptive analysis of the opinions of experts on the use of models for the pictorial perception has been carried out, facilitating the learning of contents and accessibility. With this first study, the models will be prepared, and a second qualitative study will begin on the emotions that the learning of the pictorial works involved provokes.

The present study might represens a step toward improving the quality of life for the target group, allowing the visually-impaired to access visual realm of art and to respond to it on esthetic and emotional levels. Educators will all appreciate It as it helps to create a more inclusive learning environment, where the academic, physical, emotional, and social needs of learners, including those with disabilities, are addressed. It is highlighted the importance of experiencing the emotions that the

learning of the pictorial works provokes in visually impaired individuals in fostering emotional wellbeing in visual handicapped persons.

Acknowledgements

A. Appendix

	TOUCH FIGURE (Question 1: Touch this figure and tell me how it feels to you)	DALI	VEL	GOYA
1	**Nice touch**	**8**	**7**	**7**
2	Unpleasant touch	1	0	0
3	Lasted	0	1	0
4	Soft touch	3	2	4
5	Rough	3	0	2
6	Different textures	6	1	1
6.1.	Same texture throughout the figure	2	0	0
6.2.	Texture makes discrimination difficult	0	0	3
6.3.	Rough	0	2	0
6.4.	Very good	8	1	1
	DISCRIMINATION FIGURE (Question 2: Can you recognize or discriminate something?)	0	0	0
7	You can discriminate parts of the figure	8	0	4
7.1.	Difficult to perceive different parts in the figure	4	0	4
8	The whole figure is recognized	4	5	1
9	Associate similar figures	2	2	0
9.1.	Recognize / discriminate various shapes	2	5	2
10	Recognize something unpleasant	2	2	0
	PARTS-DETAILS (Question 3: What parts and details of the figure do you perceive?)	0	0	0
11	arms	2	2	3
12	Legs	3	0	2
13	Head	2	4	3
14	Position	4	4	3
14.1.	Back, loin	1	1	0
15	Details (clothing, ornaments, items)	29	26	21
	POSTURE (Question 4: What is your posture?	0	0	0
16	Crouched down	0	0	2
16.1.	Stretched legs	0	2	0
17	Bent knees	0	0	3

TOUCH FIGURE (Question 1: Touch this figure and tell me how it feels to you)		DALI	VEL	GOYA
1	**Nice touch**	**8**	**7**	**7**
REPRESENTATION (Question 5: what does it represent? (Person, animal, thing)		0	0	0
18	Woman	1	0	1
19	Man	0	1	2
19.1	Moving	2	0	5
19.2.	Difference Man and woman	0	0	3
19.3	Animal (suitable according to the picture)	0	3	0
19.4	Plant (suitable according to the chart)	0	0	2
19.5	Thing (suitable object, according to the picture)	6	2	1
FIGURE SIZE (Question 6: What do you think about the size of the figures?)		0	0	0
20	Big	2	0	0
21	Medium	0	0	1
22	Little	1	0	2
23	Thin	1	0	0
24	Thick	0	1	0
25	Robust	2	0	0
25.1.	High	2	0	0
25.2.	Suitable	2	6	1
25.3.	Different sizes	4	5	0
MODEL DISCRIMINATION (Question 8: Touch the model and say impressions)		0	0	0
26	Figures and parts can be discriminated	5	1	1
27	The whole figure is recognized	2	4	1
27.1.	Same material	1	0	1
27.2	Different material	2	0	0
27.3.	Different figures	0	0	1
27.4.	It is necessary to receive guidelines to follow an order	1	0	11
27.5.	Parts of the figure difficult to recognize	2	0	0
MODEL PERSPECTIVE (Question 9: Do you see different planes?)		0	0	0
28	Elements far (small)	5	3	0
29	Items close (large)	5	4	2
30	Different planes differ in space	6	5	1
30.1.	Use figures to represent / differentiate perspective	1	4	0
30.2.	Perspective is not appreciated	2	0	0
30.3.	Relies on texture to represent perspective (gentle river, rugged mountains)	1	1	0
BOX REPRESENTATION (Question 10: Give us your opinion on whether it adequately represents the content of the box)		0	0	0
31	Suitable characters	0	4	5
32	Enough characters	1	2	6

TOUCH FIGURE (Question 1: Touch this figure and tell me how it feels to you)		DALI	VEL	GOYA
1	**Nice touch**	8	7	7
33	Details to know the time (clothes, wrinkles, ties)	6	6	9
3. 4	Details for character differences (dresses, accessories such as hat, ties, etc.)	eleven	2	6
35	Hairstyle	0	0	3
36	Represent the scene	2	18	3
36.1.	Approaches the context where this work was created	2	4	0
MODEL DISTRIBUTION (Question 11: Give us your opinion about the distribution of the figures in the scene)		0	0	0
37	Elongate	1	0	0
38	Narrow	1	0	0
39	Depth	1	0	0
40	More characters	0	4	0
41	Less characters	2	0	0
41.1	Suitable characters	7	4	2
41.2	Adequate (the distribution)	1	3	3
41.3	Different (distribution)	2	0	0
APPRECIATIONS IMPROVEMENT (Question 12: Give us suggestions for the use and improvement of the model)		0	0	0
42	Well ok ...	13	14	14
43	Bad, inappropriate	7	1	5
44	Regular / Confusing	1	1	0
45	Bizarre	1	0	4
45.1.	Surreal	2	0	0
45.2.	Interpretation of the subjective picture	1	0	0
46	Dramatic	5	0	0
46.1.	Difficult to understand / recognize	7	2	11
46.2.	Good box to explain perspective / proper	4	0	1
46.3.	Meaning of the box	9	0	0
46.4.	Recognize the process of making the model	3	0	0
46.5.	Knowledge of the blind	6	2	6
46.6.	Appreciations that the table does not have	4	1	1
46.7.	Type of material used	8	0	2
46.8	Details (of the model)	0	1	2
MODEL SIZE (Question 13, what do you think of the size?)		0	0	0
47	Big	0	0	1
48	Medium	2	1	1
49	Little	1	0	0
49.1.	Different sizes	2	1	0
49.2.	Appropriate size	1	0	0

TOUCH FIGURE (Question 1: Touch this figure and tell me how it feels to you)		DALI	VEL	GOYA
1	**Nice touch**	**8**	**7**	**7**
49.3.	Similar sizes	1	0	0
TOUCH MODEL (Question 14: what do you think of touch?)		0	0	0
56.	Soft	2	1	1
fifty.	Rough	0	1	0
51.	Rough	1	0	0
52.	Lasted	0	1	0
53.	Soft.	3	2	2
54.	Nice	4	1	5
55.	Unpleasant	1	0	0
55.1	Different textures are perceived	1	6	0
56.	Other uses of the box	2	0	0
57.	Explanation help to understand the picture	0	13	8
58.	Appreciations (in general or in relation to the model)	1	17	7

Table A1.
Open interview questions and categories extracted. Frequency of responses in the Dalí, Velázquez and Goya model, and the total.

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