

Inclusion for Cultural Education in Museums, Audio and Touch Interaction

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Abstract. Inclusive access to culture for all people in institutions, such as museums, is an important issue specified in French laws and is also recognized internationally. This article investigates inclusion of blind and partially blind visitors in museums. The pilot study conducted involves blind, partially blind, and sighted people and observes their perception of audio descriptions and different tactile representations within a museum. 12 participants were asked to experience three different conditions for 3 scenes of the Bayeux Tapestry using inclusive and co-created audio descriptions, simplified swell paper representations, and high relief representations. Overall, a high level of interest was found across all conditions, with multimodality through audio and tactile stimulus found to have enriched participants' experience. However, more guided tactile exploration would be better. From participants' feedback, some observations have emerged which could be explored for the development of new technologies to better respond to museum visitors' expectations.

Keywords. Blind, partially blind, inclusion, cultural education, multisensory, museums

1. Introduction

At the international level, access to culture is a right for all persons, with or without a disability. This is recognized by the United Nations Convention on the Rights of Persons with Disabilities in 2006 and signed by France in 2007 (article 30) [1]. This implies very concrete measures. Thus, the first paragraph of that article stipulates that the signatory parties to the Convention "shall take all appropriate measures to ensure that persons with disabilities enjoy access to cultural materials in accessible formats". Museums are prime locations for cultural life and learning. In France, the 2001 decree established the National Commission on Culture and Disability, whose "mission is to facilitate access to culture for persons with disabilities, whatever the nature of the disability, with a view to enabling them to participate fully in cultural life" (art. 1).

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In addition, the 2006 law "on freedom of creation, architecture and heritage", stipulates, in its article 3, that the State must "support a policy of accessibility of artworks for the public with disabilities and promote professional, associative and independent initiatives aimed at making culture and arts accessible for people with disabilities (...)". The "Inclusive Museum Guide" project, focusing on two-dimensional works of art (primarily paintings, embroidery and wall-hangings) and access to such works for blind and partially blind (BPB) people, is part of this legislative framework. Thus, for our team, and in accordance with international and national law, making works of art accessible is a necessity of the states and institutions concerned, a necessity that we help to achieve by working in collaboration with several museums [2].

In our previous publications [3,4], we have pointed out that despite the efforts, often crowned with success, made in this direction by many French museums [5,6] the major survey of the Direction of Museums of France in 1992 had shown their very low rate of accessibility [7,8]. The right to cultural participation through the accessibility of works of art is still far from being realized for people with disabilities, especially for blind and partially blind people, because of the persistent prioritization of sight over the other senses, but also, more broadly, of the "taboo and intolerance towards disability that persists in France" [9]. According to several blind and partially blind people interviewed on this subject, [10] "we are left with only crumbs": most of the works remain inaccessible to them, and the few devices put in place consist mainly of guided tours or specific workshops. Although they are often acclaimed by the people concerned [11], they do not offer to BPB autonomous access to the museum and, above all, help to keep BPB apart from other members of society.

In the 1990s, such visits and workshops were the only accessibility devices envisaged by the Directorate of Museums of France (1992) [12]. These measures are still the ones that are first mentioned in the "Charter for the reception of disabled persons in cultural facilities", published in 2007 by the National Commission "Culture-Disability": "In the context of specific visits, multisensory manipulations, fun and educational devices, tours in the museum and/or workshop are all new approaches that make visitors actors" - Even though this charter stated a little earlier, that "it is not a question of creating a ghetto around disabled people" (p.42). This Charter nevertheless has the merit of also mentioning devices that not only allow access to works of art in complete autonomy, but are still inclusive. First of all, the audio guide: just like people who see, "Blind or visually impaired people appreciate it, if it is descriptive enough. It must be easy to use and always associated with signage and lighting (an audio guide is useless if the identification of the work described is unreadable) (p.49). Then, tactile reproductions: "Tactile models and images must meet the criteria of tactile and visual readability. Their use allows a better representation – partial or global – of the volumes of a building, a work, an object, certain details" (p. 50). However, the Charter does not mention the importance of associating audio with touch for it to make sense [2].

We propose that a multisensory inclusive museum approach can make museums accessible to all, create in any visitor, BPB or sighted people (SP), new aesthetic impressions while experiencing multimodal representations of 2D artworks, deepen and enrich experience of 2D artworks and enhance memorability of the observed elements of art. These impressions can be shared with others, irrespective of visual experience.

A haptic tablet, F2T, was developed to induce the perception of a shape through force feedback applied through a joystick and audio feedback accompanying the exploration [14]. To articulate perceptions of audio with touch and to prepare for future tests with F2T, we did some preliminary pilot evaluations of different test conditions in

a museum to get feedback from an inclusive audience. The purpose of this exploratory evaluation is to find out how blind or partially blind people and the sighted public perceive the same audio descriptions and tactile representations in a museum atmosphere; what can we learn about the responses to different types of multisensory interpretation, within a museum environment.

2. Evaluation

This qualitative study focuses on the combination of audio (audio description) and tactile (relief representations) stimuli applied to the Bayeux Tapestry [15]. The museum has 3 high-relief scenes made by the partially blind artist Rémi Closset with the support of the Valentin Haüy Association. The same scenes were made in a simplified way, in swell paper at the Centre Normandie Lorraine (see Fig.1) following the rules of tactile representations [16].

The research questions considered in this evaluation are: 1) How the combined use of audio description and tactile supports affects the experience of the Bayeux Tapestry. 2) How can technology be developed to facilitate access to visual art for all (inclusiveness).

The evaluation involved 12 participants recruited on a voluntary basis, 7 of them were blind or partially blind (BPB) and 5 were sighted people. In the BPB group there were 5 men and 2 women; in the sighted group (SP) there were 2 men and 3 women. There were 5 people who use Braille and half of the participants had already visited the Bayeux Tapestry Museum in the past. The average age of the participants is of 51.42 ± 16.64 years old. The details of the BPB and SP groups are shown in Table 1.

Table 1. Age distribution (years old) between groups of participants.

Visual perception	Min.	Max.	Average	SD	Number
Blind and partially blind people	24.00	71.00	51.29	17.42	7
Sighted people	29.00	69.00	51.60	13.59	5

The evaluations took place under 3 conditions:

- Condition A: Playback of audio description (V1) in front of the tapestry, no tactile support.
- Condition B: Playback of audio description (V2), with swell paper diagrams support
- Condition C: Playback of audio description (V1) with high relief support.

In this project, the audio descriptions of the Tapestry (V1 and V2) are Inclusive Co-created Audio Descriptions (ICAD) - co-created by groups of blind, partially-blind and sighted people [2]. The ICAD is composed of two descriptions: a brief description and a detailed description. The specificity of the brief description is that the scene is described from the point of view of a partially blind person.

The detailed description is co-created with the questions asked by BPB persons and answered by sighted persons (SP). This collective work is echoing that of the

embroiderers. The detailed descriptions follow the direction of the narrative, from left to right. An example of ICAD is given in [17].

Two versions of the ICAD were created. In version 1 (V1) the ICAD only includes description of the artworks. Version 2 (V2), was based on V1 but incorporates guided touch of the swell paper supports used in condition B. These swell paper supports, focus on key elements of the scene in the tapestry. The representation of these elements is simplified to represent objects discernible with fingers with "comfort" spaces that separate the elements [17]. For condition B, version 2 of the ICAD described the scene more broadly, but also incorporated guidance for the tactile experience, and description of that tactile experience.

In condition C, the high relief details the entire scene. Version 1 of the ICAD was used in Condition A and Condition C, with no tactile description.

After each condition, participants completed a questionnaire, which included fixed-response questions using a 5-point Likert scale (including enjoyment, interest), and free text responses which provided participants with the opportunity to elaborate on their experiences. Given the size of the sample, no inference tests were run on the numerical data, and so any reported differences are only suggestive.

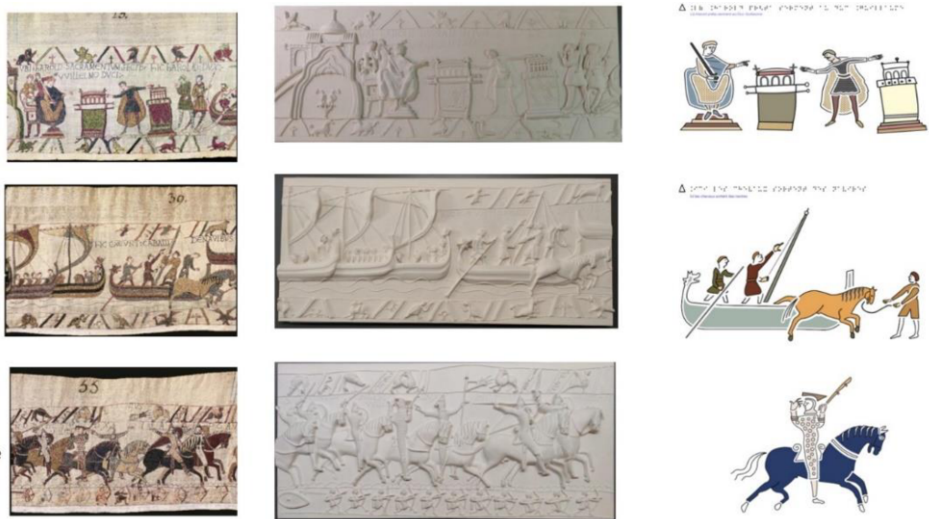


Figure 1. Three scenes from the Bayeux Tapestry (scenes 23, 39, 55) on the left column, relief representations (middle column) and swell paper representations (right column) of the same scenes.

3. Results

Results indicated that the audio description alone (condition 1) was found interesting, allowing focus on the scene presented in front of the participants. On the Likert scale with a rating out of 5 (1=not at all, 2=a bit, 3=neutral, 4=fairly, 5=a lot) presented in the table 2, participants showed high satisfaction with all conditions. Very small differences were observed, with all conditions (median= 5/5) with a lower minimum value for conditions A and C (range = [2,5]), whereas condition B has a smaller range ([4,5]).

Table 2. Likert scale statements results for conditions A, B and C.

Conditions	A	B	C
	Median [min,max]	Median [min,max]	Median [min,max]
How enjoyable was the experience?	5 [2,5]	5 [4,5]	5 [2,5]
How interesting was the experience?	5 [4,5]	5 [4,5]	5 [2,5]
How understandable was the tactile experience?	5 [2,5]	5 [2,5]	4 [2,5]
Has the experience enriched your feelings about the Bayeux Tapestry?	-	5 [2,5]	5 [3,5]
Are you satisfied with the amount of information provided by the scene?	-	5 [3,5]	4 [2,5]

Exploring participants' level of interest, again, scores are all near the upper limit, suggesting a very high level of interest across all conditions (median=5/5). Here, conditions A and B have the same range (range= [4,5]) and is slightly higher than condition C (range= [2,5]). All of the experiences were rated as very understandable. With condition A and B with a median of 5/5 and a range of [2, 5], with a very small reduction in understanding for condition C (median=4/5, range= [2,5]).

To the question of which condition, they preferred, three participants (2 BPB and 1 sighted person) mentioned that audio description alone (condition A) would suffice but a tactile model would be a plus because it would make certain elements represented tactilely more prominent. The rest of the participants preferred the combination of audio description and a tactile support.

Multimodality (Audio and Touch) is considered an enriching experience (Condition B (median= 5/5, range= [3,5]) and Condition C (median= 5/5, range= [2,5]). When asked how audio description and tactile exploration affect the experience, participants' responses revealed that they are sensitive to possible mismatches between what is represented and what is being listened to. For condition C, the audio description mentions the colours and the sighted participants are disturbed because the high reliefs have no colour (Fig. 1 middle column). For the blind and partially blind participants, if audio description does not describe what is being touched at the time of description, they would search for the described item without audio guidance. This can also be deduced through the lower results of participants' satisfaction for the amount of information presented (condition C: median= 4/5, range =[2,5], and condition B: median=5/5, range= [3,5]), where in the tactile representation of condition B the information is vastly simplified and reduced, and the audio description with tactile guide proposes better guidance for users, compared to the high relief of condition C with no guidance from the audio description. Participants, in general, would like to be more guided to touch it. They prefer to listen and touch at the same time.

When asked how visitors prefer to experience the Bayeux Tapestry, from a distance or in front of the Tapestry, some blind and partially blind participants remarked that it was not useful to come to the Museum to only listen to an audio description that could be posted online. The tactile support can therefore bring added value to the museum experience of visitors. From a practical point of view, participants reported a preference for Condition B, where the tactile experience was integrated with the audio experience. From an aesthetic point of view, high relief (Condition C) is preferred because it enhances the elements depicted and it is pleasant to the touch, but the imposing size can be intimidating.

As shown in table 3, for the question "What do you think about the level of detail?" on the Likert scale (1=not enough detail, 2=little detail, 3=enough detail, 4=a little too much detail, 5=too much detail), participants found sufficient representation of detail for all conditions with condition A having the smallest range (median = 3/5 : "enough detail", range = [3, 4]).

Table 3. Results for conditions B and C on the amount of detail presented for the participants.

Conditions	A	B	C
	Median [min,max]	Median [min,max]	Median [min,max]
What do you think about the level of detail?	3 [3,4]	3 [2,5]	3 [2,5]

Audio descriptions (condition A) are considered to be about the right length, although some participants suggested it was too long. The high relief (condition C) has some details not always indicated with the audio description that were pointed out by several participants.

Overall, some of the observations that emerge from the evaluation are the following:

- Synchronisation of audio-touch guidance with touch exploration is primordial;
- Providing more detailed descriptions of important elements in the scene (e.g. colours) should be on demand;
- Protruding elements should be easily discernible by different textures or relief effects;
- A simplified version of the tactile information should be available; however, the scene should also be presented in full;
- The choice of audio and tactile support or audio only should be available to all.

4. Conclusion

Through this article, contextual information was presented to better frame inclusion of BPB people through their museum experience, especially according to French laws, but also internationally. To that extent, a pilot evaluation was conducted to investigate multisensory experience of BPB people and SP through touch and audio, in the museum of the Bayeux Tapestry. 12 participants experienced three different conditions with audio (ICAD) and tactile representations (swell paper and high relief representation) of 3 scenes from the Bayeux Tapestry. The results showed that participants found interesting every condition. However, from the feedback of the participants some points still need to be worked on, especially how multisensory presentations can be created. From the observations, technologies should look into the personalization of a museum experience according to the visitor and, as such, support adjustable representations.

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