

# Analysing Texts and Drawings: The Teenage Perspective on Enjoyable Museum Experiences

Vanessa Cesário  
Madeira Interactive Technologies  
Institute & University of Porto  
Madeira, Portugal  
*vanessa.cesario@m-iti.org*

**The contribution of this paper is centred around the qualitative data research conducted from several co-design sessions deployed with 155 teenage participants aged 15-19. The participants were asked to ideate a mobile museum experience that they would enjoy by writing and drawing about it. For this paper, we go over the thematic analysis applied to the results gathered as well as reporting the challenges faced and our attempts to overcome them. However, this work is still preliminary and will make use of this workshop to improve it.**

*Museums. Co-design. Qualitative analysis. Thematic analysis. Drawings. Teenagers.*

## 1. INTRODUCTION

Museums and cultural heritage spaces offer solutions for young children but not much specially targeted at teenagers (Tzibazi, 2013), who are the next generation of adults and thus the future of museum audiences. They should be given a “voice” and involved early in the design process to maximize chances of involvement in the museum practices and offers. For these reason, we deployed several co-design sessions with a total of 155 teenage participants, in order to understand how would they prefer to engage with museum tours. The authors used the Natural History Museum of Funchal as a case study.

## 2. THE CASE STUDY

We follow the framework presented in our previous work (Cesário, Matos, Radeta, & Nisi, 2017) to engage teenage audiences in the design of interactive experiences for museums. We designed for a single session and engaged 155 participants in short bursts of co-design sessions to end up gathering ideas to be examined later for trends, as employed in ideas concept generation of Hakkila and colleagues (Hakkila et al., 2016). We used the data from the sessions to gather feedback and reveal insights on how teens think interactive technologies could enhance their overall experience at a museum.

### 2.1. Sample

This research was conducted in 2017 throughout several months, where the principal researcher approached students from different classes and regions in Portugal. In total, 155 participants aged 15-19 took part in the studies. In each session, the students were divided into groups, and we ended up with a total of 46 groups with an average of 3-4 students per group mixed by gender (49 females, 106 males).

### 2.2. Procedure

The sessions took place in their normal classrooms and took 90 minutes to complete, and the following topics were addressed: 1) introduction, 2) co-design session, 3) evaluation of the session by the participants. For the purposes of this contribution, we are going to focus on the qualitative analysis conducted for the co-design sessions.

#### 2.2.1. Co-design session

The students were involved in a 45-minute co-design session. For this co-design process, the students were divided into groups (total of 46 groups) and given two different working sheets per group (sheet A and sheet B, Figure 1) (Cesário et al., 2017).

Figure 1. Left: sheet A. Right: sheet B

Sheet A contained three spaces to be filled by the group participants regarding the general idea behind the whole experience: 1) *Narrative: what is the narrative underlying the experience?* 2) *Species/Artefacts: how do visitors interact with the museum's artefacts?* Also, 3) *Mechanics/Tutorial: which steps do users have to take to complete the experience?*

Sheet B, on the other hand, contained the wireframe of a smartphone where students were asked to draw some detailed screenshots for the mobile application that they had previously described. Sheet B was handed out as many times as requested, as some groups wanted more than one screenshot. Some examples of the design work made by the participants can be found in Figures 3 to 6. For sheet B, the participants were also told to write captions near the drawn buttons to help us understand its meaning.

### 3. ANALYSING THE DATA AND CHALLENGES ENCOUNTERED

All the data was brought together to identify the categories and themes about the perceptions of teenagers on enjoyable interactive exhibitions for museums. We used thematic analysis to report the data gathered. This technique is used for identifying, analysing, and reporting patterns within data. It minimally organises and describes the data set in detail (Braun & Clarke, 2006). NVivo 11 was used to organise the analysis:

*Familiarizing ourselves with the data:* A detailed analysis of sheets A and B was conducted to evaluate the ideas of the groups and drawings.

- Sheet A: We firstly started coding the results from sheets A. The phrases that each group wrote on sheet A were transcribed (we refer to them as transcripts, where each sentence element stands as one transcript) and then categorised into codes, highlighting patterns and trends emerging from participants' transcripts. Then, these codes were grouped

into subthemes, and finally, the codes were grouped into themes (Figure 2). We organised the data into 4 main themes that will be briefly showed on the Results section.



Figure 2. Map of how the thematic analysis was conducted.

- Sheet B: The challenge was the one regarding how to transcribe and code the drawings from sheets B. To overcome this challenge, we attempted transcribing all the graphic elements as transcripts, and then, were categorised into the codes derived from sheets A, and consequently, the same subthemes and themes. Here the captions near the drawn buttons that users wrote helped us to understand which interaction the button would have. For example, some participants wanted to draw a ranking button. Some of them drew a button typing ranking on it, while others drew a square and then made a caption informing us that by typing this button the user will check the ranking. For both of these examples, we coded the buttons as "ranking".

*Generating initial codes:* Transcripts were grouped into preliminary codes that had the same meaning.

*Searching for themes:* Codes were sorted according to overarching themes.

*Reviewing themes:* The relation between codes and themes was double checked by the research team to guarantee the same meaning. A thematic map with codes, subthemes and themes was generated from this step (Figure 7).

*Defining and naming themes:* Themes were refined to identify broad themes and subthemes, and given clear names and definitions to capture the essence of each one (Figure 8).

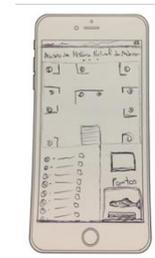
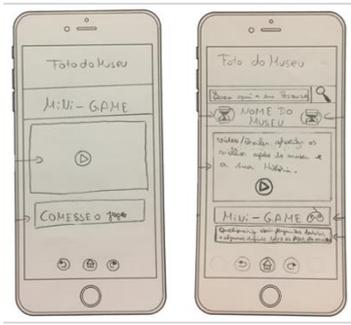
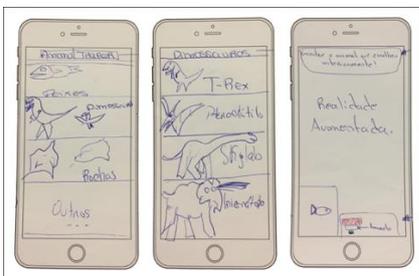


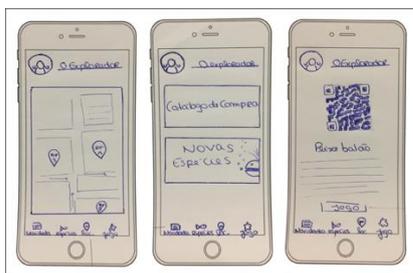
Figure 3. Drawing from Group #9. They sketched some points of interest in a map, and punctuation (**Themes:** Interaction, Gaming; **Subthemes:** Localization, Achievements; **Codes:** map, location, points).



**Figure 4.** Drawings from Group #8. From left to right: 1) the first screen of the app depicts an introduction to the game through a playable video (**Theme:** Gaming; **Subtheme:** Information, Challenge; **Codes:** tutorial, game); 2) the second screen shows a video about information of the museum, and buttons to start a mini-game (**Themes:** Gaming, Museum; **Subthemes:** Challenge, Curiosities; **Codes:** game, museum).



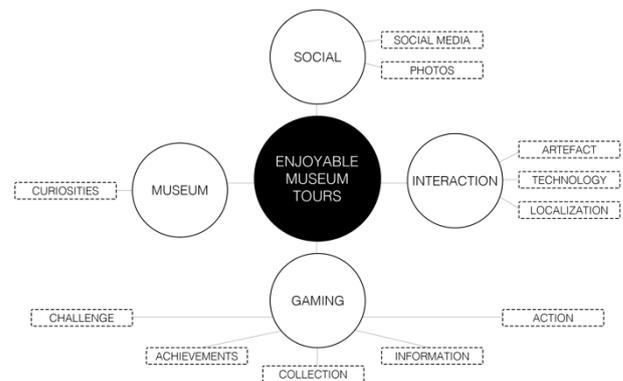
**Figure 5.** Drawings from Group #20. They sketched 1) a list of categories of the main exhibits (**Theme:** Interaction; **Subtheme:** Artefact; **Code:** categories and choosing); 2) a list of detailed species of a category chosen (**Theme:** Interaction; **Subtheme:** Artefact; **Code:** categories and choosing); and 3) augmented reality to find the specie selected (**Theme:** Interaction; **Subtheme:** Technology; **Code:** augmented reality).



**Figure 6.** Drawings from Group #21. They sketched 1) the map of the museum highlighting points of interest (**Theme:** Interaction; **Subtheme:** Localization; **codes:** map, location); 2) a list of categories to choose (**Theme:** Interaction; **Subtheme:** Artefact; **Code:** categories and choosing); and 3) the information revealed through a QR code (**Theme:** Interaction; **Subtheme:** Artefact, Technology; **Code:** information, QR codes).

THEME	Subtheme	Codes
GAMING	Challenge	Clues
		Riddles
		Quiz
	Achievements	Timer
		Game
Ranking		
Progression		
INTERACTION	Artefact	Achievements
		Points
		Unlock
	Technology	Treasure-hunt
		Levels
Collect		
Complete		
SOCIAL	Social Media	Help
		Tutorial
MUSEUM	Curiosities	Shop
		Feed
INTERACTION	Artefact	Information: textual, sound, video, image
		Categories and choosing
		Interactions
		User takes the role of an artefact
		3D object
	Technology	Augmented Reality
		Beacons
		QR codes
		Catch codes
		Virtual reality
SOCIAL	Social Media	Image recognition
		Gestures
	Localization	Holograms
		Search
		Map
SOCIAL	Social Media	Location
		Orientation
		Social networks
SOCIAL	Photos	Profile
		Friends
SOCIAL	Photos	See what others have done
		Normal photos
SOCIAL	Photos	Photos and selfies with AR
		Museum

**Figure 7.** Map of the thematic analysis conducted: transcripts that generated codes, then subthemes, and finally themes.



**Figure 8.** Map derived from the qualitative analysis.

#### 4. RESULTS

From coding sheets A and B, we got 805 individual transcripts which reflect patterns and trends of teenagers regarding enjoyable museum experiences (Figure 7). Then those transcripts were grouped into 42 codes, then categorised into 11 subthemes, and finally categorised into 4 main themes, namely 1) *Gaming* (361 transcripts), 2)

*Interaction* (381 transcripts), 3) *Social* (39 transcripts), and 4) *Museum* (24 transcripts).

#### 4.1. Gaming

Games have always been part of our culture. As a rule, game elements which are used for purposes beyond entertainment enter the realm of gamification. Gamification refers to the use of design elements and characteristics of games in non-game contexts having other purposes than their regular expected use as part of an entertainment game (Deterding, Dixon, Khaled, & Nacke, 2011). All groups made use of some game element in their concepts. Participants would enjoy the implementation of challenges within a museum experience to prompt them to search and discover artefacts and be provided with more information about these. This idea is based on solving riddles/enigmas to go further in the experience. The resolution of the riddle will prompt the user to go to another specific artefact and receive information about it as well as another riddle/clue, and so on. These challenges could come through quizzes and mini-games as well. The implementation of a timer and a ranking would also challenge these visitors when performing the mobile experience in order to have a better performance at the end of it. Additionally, it is important to give feedback to users about their progression within the experience. The fact of receiving points, unlocking information and increasing the level of the game are examples of achievements that could challenge the player to discover museums. Moreover, the concept of collecting pieces to form a bigger picture, or completing a puzzle, was also referred by the participants. Finally, as any game, participants suggested having the power to request some help within the app, as well as a tutorial at the beginning. Also, they would like to buy items during the game experience and to have the power of feeding some characters or species in an experience.

#### 4.2. Interaction

The theme of *Interaction* recalls the desire of the participants to have some interaction with artefacts inside a museum. Firstly, this kind of interaction could happen by receiving information about the artefacts through several ways, such as text, sound, video or image. Users expressed the desire of having a set of options in the app to choose from, and consequently choose which kind of experience they would like to take. Likewise, they would like to interact with images, specially with 3D models of the artefacts. Additionally, also taking the role of an artefact, where they could visit the museum through the eyes of a selected species, would prompt them to take a museum experience. This kind of interaction could also happen through

the technology used, and feedback on the location of the specific exhibits to encounter.

#### 4.3. Social

The *Social* theme is related to the desire of sharing the experiences on social media channels within a mobile application as well as taking pictures. This theme embraced the words relating to the usage of social media within the application and words regarding taking pictures and selfies to have something to remember about the museum.

#### 4.4. Museum

The *Museum* theme concerns the aspects related to the museum as a physical space that the participants remembered and made a point when writing/drawing, such as showing general videos and information about it.

### 5. CONCLUSION

This contribution revolved around the thematic analysis applied to texts and drawings from 155 teenagers regarding their views on enjoyable museums tours. It was explained how the primary challenge, coding the drawings, was overcome, as well as the themes and codes gathered from this analysis. We believe this method of coding drawings was a suitable method that could work when applied to other drawing scenarios. Moreover, the fact of starting coding through the texts from Sheet A it helped the analysis of coding the drawings as it was only necessary to place the images/buttons drawn into the codes already generated.

Nonetheless, this work is still preliminary and more insights and conclusions should derive from it. Current and future work is taking these findings and creating more structured insights, conclusions, and prospective validation to inform the design, research and evaluation of interactive technologies in a museum context targeting teenagers.

### 6. ACKNOWLEDGEMENTS

The research leading to this work has received funding from ARDITI (Agência Regional para o Desenvolvimento da Investigação, Tecnologia e Inovação), under the PhD scholarship number M14-20-09-5369-FSE-000001.

### 7. REFERENCES

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp0630a>

- Cesário, V., Matos, S., Radeta, M., & Nisi, V. (2017). Designing Interactive Technologies for Interpretive Exhibitions: Enabling Teen Participation Through User-Driven Innovation. In *Human-Computer Interaction - INTERACT 2017* (pp. 232–241). Springer, Cham. [https://doi.org/10.1007/978-3-319-67744-6\\_16](https://doi.org/10.1007/978-3-319-67744-6_16)
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From Game Design Elements to Gamefulness: Defining “Gamification.” In *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp. 9–15). New York, NY, USA: ACM. <https://doi.org/10.1145/2181037.2181040>
- Hakkila, J., Alhonsuo, M., Virtanen, L., Rantakari, J., Colley, A., & Koivumaki, T. (2016). MyData Approach for Personal Health – A Service Design Case for Young Athletes. In *Proceedings of the 2016 49th Hawaii International Conference on System Sciences (HICSS)* (pp. 3493–3502). Washington, DC, USA: IEEE Computer Society. <https://doi.org/10.1109/HICSS.2016.436>
- Tzibazi, V. (2013). Participatory Action Research with young people in museums. *Museum Management and Curatorship*, 28(2), 153–171. <https://doi.org/10.1080/09647775.2013.776800>