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# Word Association: Engagement of Teenagers in a Co-design Process

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**Abstract.** This submission describes the analysis of an evaluation of 155 teenagers (15-19 years old) who took part in a co-design session centred around how mobile technology might enhance their own experiences in a natural history museum. At the end, participants were required to make a word association to evaluate the session. An analysis of how teen participants responded to the design session was conducted using thematic analysis to show the different categories of adjectives used by participants in their evaluations. The goal for the evaluation was mainly to pilot the design session process and if teens enjoyed participating in it. We believe this is of interest to designers and cultural heritage professionals.

**Keywords:** Co-design, Evaluation, Thematic analysis, Teenagers, Museums.

## 1 Introduction

We follow the framework presented in our previous work [1] 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 [2–4] to gather ideas to be examined later for trends. We used the data from the sessions to gather feedback and reveal insights on how teens think mobile interactive technologies could enhance their overall experience at a museum. 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 gender mixed students (49 females, 106 males). The sessions took place in their usual classrooms and took 90 minutes to complete, and the following topics were addressed: 1) introduction, 2) 45-min co-design session, 3) evaluation of the session by the participants (word association). At the end of the 45 minutes of co-design activity, the participants were invited to describe the co-design session in one word on a piece of paper, which would remain anonymous, in order to rapidly identify their feedback on the co-design session carried. Even though the participants were old enough to apply a questionnaire to gather their feedback on the session, we opted to use a word association to evaluate it, as Carl Jung

[5] theorised that people connect thoughts, feelings, experiences and information by way of association. In the Association Test, a test used in psychology to study the organisation of mental life, the subject is instructed to state the first word that comes to mind in response to a word, concept, or other stimuli. In this study, the participants were told to report the first word that comes to mind in response to the co-design session carried. For this contribution, we are going to focus on the qualitative analysis of the word association made by the participants.

Code	Count	Subtheme	Theme	Total
coolness	51	Interesting	POSITIVE	136
notable	34			
fun	7			
interaction	12	Collaboration		
collaborative	9			
learnable	2			
creative	13	Innovation		
innovative	6			
easy	2	Simple		
tricky	6	Complex		
uninteresting	2	Unexciting	NEGATIVE	11
not appealing	1			
uncomfortable	1	Obtrusive		
repetitive	1			
different	6	Diverse		
indifferent	1	Somewhat		
more or less	1			

**Table 1.** Map of the thematic analysis conducted over the teens assessment of the session: the one-word evaluation by participants generated codes (column “count” shows us how many adjectives each code encompasses), then these codes generated subthemes, and finally themes. Column “total” indicates how many adjectives each theme comprises.

## 2 Thematic analysis

All words were brought together to identify the categories and themes about the engagement of teenagers in participating in a co-design session. 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 [6]. NVivo 11 was used to organise the analysis. A detailed analysis of the words was conducted to evaluate the teenagers’ enjoyment in taking part on the sessions. We firstly started coding the words. All words were transcribed into NVivo 11 (we refer to them as adjectives) and then categorised into 17 preliminary codes that had the same meaning, highlighting patterns and trends emerging from participants’ adjectives. Then, these codes were sorted into 9 subthemes, and finally, the codes were grouped into 3 overarching 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 (Table 1). We organised the data into

the 3 main themes shown in the Results section, where each of the three overarching themes, subthemes and codes are described.

### 3 Results

#### 3.1 Positive evaluation

Inside the *Positive Evaluation* theme (136 evaluations), we inserted all the subthemes which are related to positive experiences about the co-design sessions that teens took part in. We coded 4 subthemes for this theme: 1) interesting, 2) collaboration, 3) innovation, and 4) simple. For the subtheme “interesting” we coded 1) the adjectives that related to the “coolness” of the session, and aesthetic qualities of attitude, behavior, comportment, appearance and style which is generally admired, such as: *amazing* and *appealing*; 2) the adjectives that describe the co-design session as “notable”, worthy of attention or notice, such as: *impressive* and *remarkable*; and 3) the adjectives related to having “fun”, enjoyment, amusement, or light-hearted pleasure within the session, such as *hilarious*. For the subtheme “collaboration” we coded 1) the adjectives regarding “interaction”, reciprocal action within the session and the other participants, such as: *dynamic* and *interactive*; 2) the adjectives regarding “collaborative” behaviours, where two or more parties work together, such as: *brainstorming* and *sociable*; 3) and the adjectives related to “learn”, gain or acquire knowledge of something through experience, or being taught together with the other participants, such as *thoughtful* and *educational*. For the subtheme “innovation”, we coded 1) the adjectives that defined the session as something “creative”, relating to or involving the imagination or original ideas, especially in the production of an artistic work, such as *original* and *unique*; and 2) the adjectives concerning the session as “innovative”, featuring new methods – advanced and original, such as *evolution* and *future*. For the subtheme “simple”, we coded the adjectives which featured the experience as “easy” to take, presenting no difficulty, such as *approachable* and *easy*.

#### 3.2 Negative evaluation

Inside the *Negative Evaluation* theme (11 evaluations), we inserted all the subthemes which are related to negative experiences regarding the co-design sessions in which participants took part. We coded 3 subthemes for this theme: 1) complex, 2) unexciting, and 3) obtrusive. For the subtheme “complex” we coded the adjectives that described the session as “tricky”, requiring care and skill because difficult or awkward, such as *complicated* and *complex*. For the subtheme “unexciting” we coded 1) the adjectives that referred to the session as “uninteresting”, not arousing curiosity or interest; and 2) the ones concerning the session as “not appealing” such as *awful*. For the subtheme “obtrusive” we coded 1) the adjectives that described the session as “uncomfortable”, causing or feeling slight discomfort, such as *annoying*; and 2) the ones that described the session as “repetitive”, the action of repeating something that has already been said or written, such as *repetition*.

### 3.3 Neutral evaluation

Inside the *Negative Evaluation* theme (8 evaluations), we inserted all the subthemes which refer to the co-design session as impartial, not helping or supporting either side – positive nor negative. We coded 2 subthemes for this theme: 1) diverse, and 2) somewhat. For the subtheme “diverse” we coded the adjectives that described the session as “different”, not the same as another similar activity – unlike in nature, form, or quality that the participants are usually used, such as *different* and *fishes*. For the subtheme “somewhat” we coded 1) the adjectives that described the session as “indifferent”, having no particular interest or sympathy, such as *unconcerned*; and 2) the ones that described the session as “more or less”, neither very good nor very bad, such as *so-so*.

## 4 Concluding Remarks

It is essential to have the perception of the participants on the co-design conducted to understand if teenagers are willing to jointly contribute with their thoughts for a common idea – in this case, for designing mobile technology to enhance their own experiences in a natural history museum. The good thing about applying a word association to gather feedback on the sessions from the participants it is because not only it is faster, but also it is a procedure for investigating which word meanings related to the session are stored in memory. Judging from the overall positive evaluation of the experience, participants enjoyed designing their ideal experiences in museums in a co-design session. However, as a limitation of this analysis, we cannot infer that all participants enjoyed the sessions because of its method or if they enjoyed it because it was conducted instead of a regular lecture. **Acknowledgments:** ARDITI, project number M14-20-09-5369-FSE-000001.

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