Shaping minds-on and hearts-on digital learning experiences: 
First lessons learned from the meSch project

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Museums, Cultural Heritage and Digital technologies

Nintendo DS, Louvre (http://bit.ly/1BOIpAU)

Musée des Arts et Métiers, Paris

Deutsches Technikmuseum, Berlin

Museo Nacional de Artes Decorativas, Madrid
50% did not touch the table at all; 17% had longer than a single-click interaction. “[Only] few educational conversations were observed at the table except for reading aloud”

“I don’t understand it either but it’s cool” – Visitor interactions with a multi-touch table in a museum”

Eva Hornecker
“There is a current view...that the museum is about information and that the object is just part of that information culture.”

“...What would it be like for visitors...to experience an embodied engagement with that object and thus form their own ideas and/or a tangible, physical connection with those who made it and used it in the past?”

Sandra Dudley, Museum materialities: Objects, sense and feeling, 2009, pp 3-4
Back to Tangible and Embodied Interaction

Victoria and Albert Museum, London

Archaeohotspots project, Allard Pierson Museum, Amsterdam

(photos by Eva Hornecker, Luigina Ciolfi)
Back to Tangible and Embodied Interaction

Gallery One, Cleveland Museum of Art, Cleveland, Ohio

Jane Alexander, Gallery One at the Cleveland Museum of Art, Curator, Volume 57 (3), pp 347-362
Co-creation and DIY: Curators, artists and designers are working together to develop do-it-yourself technology for the creation of adaptive smart exhibits.

Tangible Interaction: The core problem underlying all digital artefacts is the loss of materiality. meSch wants to put the physical back in the centre of cultural heritage experience.

Digital artefacts and digital resources: A wealth of digital repositories is available. meSch wants to make innovative use of them by integrating them in a tool to create adaptive smart exhibits.
Co-design and co-evaluation Approach
Our meSch museums
The first meSch prototypes
Museon: The Interactive Showcases

This cap has been acquired through a king’s intermediate.

Deze muts is verworven via een koninklijke bemiddelaar.

Normally I am stored in one of these boxes.

Gewoonlijk zit ik in een van deze dozen.

Tweet me: #EcsiteCap
Are@: #EcsiteCap @meschcases. wish I could try you on! http://t.co/MrjwkY7K9Y
The Loupe

- Easy and enjoyable to use
- Focus on the loupe, not the objects
- A lot of playing but what about learning?
The Loupe study: Research questions

- Where is the focus?
- How easy is it to use?
- Can it be shared?
- How much content should be included?
- Text vs other media
- Cognitive & affective impact
The Loupe study

Protocol

- Pre-visit questionnaire
- Observations
- Post-visit questionnaire (25 questions)
- Semi-structured interviews
- 22 participants
- Channels:
  - Allard Pierson Museum, Friends of the Museum
  - University of Amsterdam students’ network
Op deze drinkschaal zie je Apollo, de god van muziek. Wat voor instrument bespeelt hij?
Demographics and visitor profiles

Man: 7
Woman: 15
Other: 0

Age groups:
- 18-24: 6
- 25-34: 1
- 35-44: 0
- 45-54: 6
- 55-64: 6
- Over 65: 3

Frequency:
- 4 times a year or more: 15
- 2-3 times a year: 6
- Once a year: 0
- Less than once a year: 0

Accompanying:
- Alone: 7
- With friends or family: 15
- In organized visit groups: 0

Guided tours
Audio guides
Mobile multimedia guides
Onsite museum interactive kiosks and displays
Text guides, books, brochures
Museum websites
I usually do not use interpretation resources
Other digital, mobile, on-line resources

0% 20% 40% 60%
How often do you use the internet to search, learn or communicate?

How confident do you feel on using digital applications and devices?
The objects included in the tour were

The content provided by the Loupe was
Using the Loupe helped me understand the featured artefacts
Using the Loupe distracted me from the original works of art

<table>
<thead>
<tr>
<th>#</th>
<th>Question</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Total Responses</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Using the Loupe distracted me from the original works of art</td>
<td>4</td>
<td>0</td>
<td>7</td>
<td>10</td>
<td>1</td>
<td>22</td>
<td>3.18</td>
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</table>
If the loupe was available in the museum, I would consider using it
Cognitive and affective impact
I recalled at least one thing I had learned in the past

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<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Total Responses</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>I recalled at least one thing I had learned in the past</td>
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<td>0</td>
<td>2</td>
<td>5</td>
<td>15</td>
<td>22</td>
<td>4.59</td>
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</table>
I learned at least one thing about mythology I did not know

<table>
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<tr>
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<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
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<th>Total Responses</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I learned at least one thing about mythology I never knew before</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>14</td>
<td>22</td>
<td>4.55</td>
</tr>
</tbody>
</table>
Post-visit questionnaire

Can you help us understand if any of the moods/emotions below occurred while:

A. Using the Loupe (Question 9)

and

B. Following the tour and going through the content (question 10)

Q9. While using the Loupe I felt:

Uninterested | ______ | ______ | ______ | ______ | ______ | ______ | Interested
Certain | ______ | ______ | ______ | ______ | ______ | ______ | Confused
Indifferent | ______ | ______ | ______ | ______ | ______ | ______ | Curious
Pleased | ______ | ______ | ______ | ______ | ______ | ______ | Disappointed
Unhappy | ______ | ______ | ______ | ______ | ______ | ______ | Happy
Excited | ______ | ______ | ______ | ______ | ______ | ______ | Bored
Motivated | ______ | ______ | ______ | ______ | ______ | ______ | Discouraged
Unconcerned | ______ | ______ | ______ | ______ | ______ | ______ | Captivated
Satisfied | ______ | ______ | ______ | ______ | ______ | ______ | Frustrated
Inspired | ______ | ______ | ______ | ______ | ______ | ______ | Discouraged
Overwhelmed by my experience | ______ | ______ | ______ | ______ | ______ | ______ | In control of my experience
What else did we learn? (interviews & observations)

- Easy vs intuitive (and learning curve)
- The loupe or an app?
- More “experienced”= less distracted?
- Types of content prompting visitors to look back at the exhibit
- The role of text
- Can be shared by visiting companions
What’s next?

• Comparative study with “traditional” text delivery
• Three museums, three large-scale exhibitions, three parallel evaluation studies
• Comparative evaluation studies among museums using closely related prototypes (Museon, Museo della Guerra, Allard Pierson Museum)
• Plan for the gathering, analysis, interpretation of “big” data
• Further explore interrelations among tangible & embodied interaction, emotions, cognition and learning
Questions?

Stay tuned!
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The project (2013-2017) receives funding from the European Community’s Seventh Framework Programme ‘ICT for access to cultural resources’ (ICT Call 9: FP7-ICT-2011-9) under the Grant Agreement 600851.