UCM Digital Schools Consultation

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UCM Digital Schools Consultation Summary

Overview

From November 2015 to February 2016 the project team:

- Visited 5 schools with a combined roll of more than 2500 students
- Observed 32 lessons in which digital resources were used in all key stages from Nursery through to 6th Form (3-18 year olds)
- Worked with 43 teachers and one trainee observing how they use collections based resources
- Looked at and discussed 28 images and handling objects from 3 UCM collections (MAA, Polar Museum and the Fitzwilliam)

The objectives of the consultation project were:

1. To determine how museum collections are currently used and accessed by teachers
2. To work with teachers to design resources and build a basic model for a UCM digital learning platform

Findings

<table>
<thead>
<tr>
<th>How are digital resources used in the curriculum?</th>
<th>How are museum collections used in teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital technology is an integral part of learning</td>
<td>All of the schools visited used their local museums.</td>
</tr>
<tr>
<td>Group learning with digital resources is more prevalent at KS1/KS2 mainly through use of interactive whiteboards (IWB)</td>
<td>Two of the schools visited UCM sites</td>
</tr>
<tr>
<td>Individualised learning with digital resources is more prevalent from KS3 onwards (iPad based in KS3/KS4)</td>
<td>None of the schools had digital museum collections embedded in a structured way within their curriculum</td>
</tr>
<tr>
<td>Images are heavily used at all Key Stages</td>
<td>There was a general fear amongst teachers of getting it wrong, of not having ‘the knowledge’ needed to teach from collections</td>
</tr>
<tr>
<td>Quizzes and online tests are frequently used at KS3/KS4</td>
<td></td>
</tr>
<tr>
<td>Video clips are heavily used at all key stages (especially BBC clips)</td>
<td></td>
</tr>
<tr>
<td>While the resources in lesson plans are accessed by teachers of all key stages they are heavily adapted for their own use</td>
<td></td>
</tr>
<tr>
<td>Online resources are heavily used (&amp; sometimes paid for) but teachers acknowledge issues around quality</td>
<td></td>
</tr>
</tbody>
</table>
What do Teachers Want from a Digital Museum Resource?

Having talked with over 40 teachers in 5 different settings, 5 clear themes emerged:

1. **Trust**: Teachers look for quality and reliability. Information must be accurate and there must be no issues with copyright.
   
   *I like the idea of having a site that is reliable and being able to visit that site time and time again* (secondary school teacher)

2. **Expertise**: Teachers Need Guidance on Teaching from Images and Objects. Teachers want a basic set of information about the object and will not spend time wading through pages of academic or curatorial text to get the information needed.
   
   *People worry about how to introduce artefacts, maybe [you could have] some kind of demonstration. What you should have is somebody model it: here’s an artefact, here’s the questions you might ask to get the children’s juices flowing, how old it is? How was it used?* (primary headteacher)

3. **Searchability**: Teachers are time poor. They need clear information that is easy to access, well organised and clearly related to key stage and topics.
   
   *It’s got to be simple and instantly accessible* (secondary school teacher)

4. **Clear Visuals**: Images are highly valued and extensively used. Many teachers use images on an interactive white board (IWB) or projected on to a wall. The images need to be clear and good quality. If there are video clips they need to be short (less than 5 mins) and clearly narrated.
   
   *It would be nice if you had a 360 of an object* (KS1 teacher)

5. **Adaptable Content**: Activity Ideas NOT Lesson Plans: Teachers search quickly to borrow images and information to embed within their lessons.
   
   *I’m not after a lesson plan but it is nice to have an idea..., if you have a video what you could link it to* (KS1/2 teacher)

**Recommendations**

- The development of UCM digital resources for schools would present opportunities for us to reach and engage more people with our museums, collections and programmes.
- There is the potential to innovate in this area nationally as existing collections based resources and not well used and understood by schools.
- Any digital resources that the UCM builds must start with our unique knowledge and expertise as museum professionals. Our work in the digital realm should be seen as an extension of what we already do, rather something different.
- Resources should be designed as a ‘pick and mix’ offering and consist of a wide range of different content. Teachers, children and young people must be central to the design, ongoing review and evaluation of anything we create. We strongly recommend termly focus groups for teachers to trial and evaluate UCM schools programming and resources.

(March 2016)
1. Introduction

1.1. Background

The University of Cambridge Museums (UCM) are an extraordinary resource for learning which have the potential to inspire and engage students of all ages and their teachers. However, when museum visits do take place they are sometimes seen as an added extra or stand-alone experience and not truly embedded into the core curriculum offer. We have been working for many years through our Continuing Professional Development (CPD) programme to encourage teachers to incorporate museum objects into their teaching on a day to day basis. Feedback from teachers about what they value from these CPD sessions has informed our understanding of this need:

- The potential to cover many areas of the curriculum and how you can look at one piece of art/artefacts and get so much out of it.
- Even if we can’t visit for first-hand experience, we can still use images to stimulate dialogues around themes in the curriculum.

There is great potential for the development of online resources for use in the classroom. The ACE/Storythings report (2015) found that the majority of teachers are constantly looking for appropriate digital resources to incorporate into their lessons. Teachers want instant, impactful inspiration to support the curriculum and the majority search on a lesson by lesson basis. Many museums are already working at capacity in many areas so by developing a digital resource the museums will be able widen their reach and allow more students and teachers to access their collections. This project was commissioned in order to research the potential for the creation of new digital content within the UCM and to understand better the way in which schools currently use and search for digital resources to support teaching and learning.

1.2 Objectives of the Consultation Project

1. To determine how museum collections are currently used and accessed by teachers
2. To work with teachers to design resources and build a basic model for a UCM digital learning platform
3. To create an outline plan for a new UCM digital resource based around teacher need

1.3 Overview of the Report

The project report starts with an overview of some recent studies in the UK and overseas exploring digital resources for teachers and schools and then shows some examples of existing collections based resources for teachers. This background informed the methodology for this consultation project which is then described Chapter 3. The next chapter contains an overview of the different ICT usage we observed in schools and a discussion of the key themes which emerged through our observations and interviews with teachers. The final chapter of the report brings this all together and offers some suggestions for future digital resource development.

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1 http://www.ezekiels.co.uk/eylan/tag/artedseducation/
2. Review of Relevant Research and Existing Collections Based Resources

2.1 Existing UCM Provision for Schools and Teachers

The current UCM offer for schools is well established within individual museums but is not linked together in the minds of school users. Rosie Amos carried out a survey over Summer and Autumn of 2015 which scoped schools provision across the museums with the aim of identifying existing and potential opportunities for museum educators to work in a more collaborative way. At the moment information can be found on individual museum websites about learning provision both on-site (e.g. visit information, sessions and activities) and off-site (e.g. learning resources, films, handling boxes).

There is the potential to create a centralised, searchable UCM database by which schools can browse and select museum visits which meet their criteria. The Fitzwilliam Museum Learning team are launching a searchable database on their new website as part of their content migration to Drupal in the Spring of 2016. This basic prototype could be refined and adapted to provide information about what taught sessions are available at each museum and so improve the way in which the UCM as a group market their on-site provision to schools. This study is focused on off-site stand-alone digital resources which may or may not be linked to an on-site visit. However, in the long term these two strands could be linked together under a new, searchable UCM schools portal.²

2.2 Some Examples of How Museum Collections are Currently Used and Accessed by Teachers

There is a growing body of research looking at how teachers and pupils use museum resources in schools. These studies form a useful foundation for the development of our own digital learning resources.

The Storythings/ ACE Report was published in 2015 and looked at how teachers find and use online resources³ and has greatly inform the planning of the current project. The study focused on the user journeys of teachers, identified challenges they faced and suggested potential areas of opportunity in providing creative and cultural education resources for teachers online.

The research was based on survey data answered by 871 teachers and a twitter chat with 168 teachers. They found that the majority of teachers are constantly looking for appropriate digital resources to incorporate into their lessons but are currently frustrated by overly prescriptive activities, out of date

² This can now be seen at http://www.museums.cam.ac.uk/visit-us/schools (added February 2017)

website, copyright uncertainty and resources which had been designed without input from schools or teachers. They concluded that:

- Resources should be **search optimised** and **featured** on existing sites where they can attract reviews and recommendations
- Include prominent information about **age suitability** and **copyright details** to prioritise ease of use
- Allow teachers to **preview** the resource before downloading and/or paying
- Highlight accreditations, recommendations and reviews
- Change the profile of existing digital channels to make resources easier to find
- Publish **case studies** of innovative use of online resources to grow trust and take up
- **Work with teachers** on designing resources
- **Subject relevance**, **ease of use** and **appropriate length** are important to teachers
- Don’t make resources that are too prescriptive, inflexible or lengthy

The recommendation to collaborate with teachers to develop resources adds further justification to this project. The list of suggestions of what teachers look for in searchable databases should be considered when designing schools resources.

The start of the current project also coincided with the **launch of the Smithsonian Learning Lab in October 2015**. The Learning Lab is based on three years of user research and includes literature reviews and prototyping exercise with teachers to explore how the digital resources from across the Smithsonian’s 19 museums, 9 major research centres, the National Zoo, and more, can be used together, for learning. The Smithsonian Project Literature Review (2012)\(^4\) contains an interesting discussion of what kind of learning takes place through existing museum websites.

Research carried out by Saiki (2010)\(^5\) looked at whether the assets that museums provide to educators enable students to fully engage with collections on a more interactive level. After examining the level on interactivity on 153 museum websites, researchers found that museums tended to focus on ‘object -based learning’ which, although valuable in itself, tending to inhibit rather the engage the learner. They rated website content on Laurillard’s (2002) five level framework:

- **narrative**- content consumable only ‘as is’ by the user. User passively receives information provided which provides the lowest cognitive engagement
- **interactive**- included sites that encourage exploration through links to other pages, online tours of the museum but cannot be changed or adapted in any way
- **communicative**- includes media that allows the user to discuss and debate ideas, for example via e-mail and discussion blogs
- **adaptive**- allows the user to discuss their interpretation of objects and receive direct feedback from an instructor.
- **productive**- incorporates tools that allow the user to manipulate the object, discuss and demonstrate their understanding of the content to the teacher by writing a story or creating a similar objects for example.

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Unsurprisingly, the final stage requires the highest level of intellectual engagement from the viewer and ensures greater long-term understanding and retention of the concepts presented. Researchers found that nearly half of museum websites remain at the narrative level, with only 24.8% exhibiting adaptive features and 22% at the productive level. Current UCM resources for schools fall mainly into the narrative level. The productive, adaptive and communicative realms should also be considered when commissioning new resources for schools.

The Smithsonian Literature Review recommendations call for resources to be developed in consideration of the following four categories:

- **Optimised search and metadata**: simplified searching, tagging, improved metadata and flexible view options with visual representations of the resources including file format information and resource type;
- **Expanding partnership and data sharing**: develop business models or benefits to Smithsonian for sharing with particular partners, a list of potential partners, create strategy and metrics to monitor success, the provision of single point created metadata to partners in multiple machine readable formats;
- **Flexible assets for use in multiple ways with students** to engage their interest, tools that maximise the use of high-quality images, tools and suggestions to help adapt resources to diverse learners needs, collecting and saving resources in a dedicated space on the site, preferences for viewing content and search results;
- **Tools and trends**: incorporate mobile-friendly features, research ways in which teachers use social media or other to share content and participate in online communities.

These findings are worth considering while planning digital resources and have many parallels with the Storythings/ACE research. The methodology they followed and questions they explored are well documented on the Smithsonian site and can be used to inform our own project.

The Smithsonian project went on to design and test a prototype site with their user groups. They conducted 2 phases of teacher research and prototyping with 89 educators in California and Washington DC. They also discovered that teachers do prefer to search by entering general search term and then filtering it if needed. They like to have a gallery to review their search results and asked for an ‘intelligent’ search function including auto-correct typing, auto-correct spelling and similar items. They also found that teachers go to many different sites to find what they need. Some participants used the Facebook option to share, but the majority emailed the link to themselves or a colleague. When using and analysing contents they found that teachers wanted to be able to save resources they found useful, organise and annotate resources according to their own needs, have the ability to allow students to use the site as much as the teacher and have options with regards to the type of viewing methods to allow for both whole class and individual interaction. When extracting content to create interactive lessons, they found that teachers want to use a variety of tools and interactive modules with improved visibility and explanations of these tools and upload resources from other sources to augment their collections. The Learning Lab has been designed in response to all these needs and enables users to:

- **Search for and Store** Smithsonian learning resources (lesson plans, etc.), learning experiences (currently called Quests), and digitised museum collections, videos, podcasts, etc.,

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6 [https://learninglab.si.edu/cms/page/news/what-we-have-learned-so-far-teacher-research-and-prototyping/](https://learninglab.si.edu/cms/page/news/what-we-have-learned-so-far-teacher-research-and-prototyping/)

7 [https://learninglab.si.edu](https://learninglab.si.edu)
• **Create and Share** with learners and peers personalised collections and learning experiences they build using a variety of resources the Learning Lab will make available, or ones they upload and link to from other non-Smithsonian sources,

• **Participate** in online learning experiences (Quests made by Smithsonian educators, or those made by other users) themselves or with others (their students, for example), and

• **Find** general information about the Smithsonian Centre for Learning and Digital Access.  

The Smithsonian Research was larger and more ambitious in scale than our UCM project but we can learn from their findings and admire and critique the interface they have created. It would be interesting to show UK teachers the Smithsonian site as part of the UCM Digital Schools Consultation Project.

**Flow Associates ‘Stronger Together’ Report (2015)** is another useful paper to consider in light of this project as it looked at how digital services can enhance museum learning and partnerships with schools. The report findings have parallels with the previous two studies but also add new perspectives. McKenzie identifies four features of good practice which include:

• **Open data and shareable content**: Freeing content from the museum so that it can be used and mashed up by educators and learners in other platforms.

• **Virtuality**: Making place-based and real-time cultural and heritage experiences available to virtual visitors, while still encouraging visits to real places. The cultural experience should be made as accessible and exciting as possible to remote audiences.

• **Empowerment**: Putting interpretation into the hands of learners, using creative digital tools and a social approach. Learners and teachers should be enabled to lead their own learning pathways.

• **Conversation**: More communication between museum staff and schools, with different experts within and outside museums not just educators, more frequently and more linked to relevant resources.

These recommendations link well to both the Storythings and Smithsonian studies and reiterate the need for consultation between schools and museums. The Flow report also places high value on empowering learners and teachers through the use of creative digital tools and social media. UCM social media campaigns are already beginning to do this with a more general audience through projects such as **Ask a Curator Day** and the **Periscope Project at MAA** and so it may be that this is another area that could be explored with schools. There might also be the potential here to link new schools resources with the UCM **Culture Finder** which encourages users to create their own collections around Cambridge.

The Flow Associates report highlights a few examples of existing good practice which are also useful to look at before planning the development of learning resources. The most well-known of these tend to be produced by large national museums or well established independent organisations and can be

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8 [https://learninglab.si.edu/news/building-the-smithsonian-learning-lab](https://learninglab.si.edu/news/building-the-smithsonian-learning-lab)


experimental (e.g. Tate Minecraft Maps) or strategic (Culture Street, Show Me). The report noted that although there are many smaller, local projects many of these go out of date quickly as they are time-limited due to funding, reduced staffing levels mean that sites aren’t evaluated, promoted or developed and there is too much energy put into starting from scratch rather than working in collaboration or using existing third-party tools. This is worth bearing in mind when planning a UCM digital resources. At every stage in the planning process it will be important to consider the legacy of the project and how content will be added, developed and evaluated going forward.

### 2.3 Some Existing Digital Resources for Schools

Whilst planning the project we have been reviewing existing resources and have created a Pinterest board to share with other educators:

https://uk.pinterest.com/ucmschools/digital-resources-for-schools/

We then selected the following three websites to show teachers during the consultation meetings.

1. **The Smithsonian Learning Lab**

A simple search for ‘ancient Egypt’ returns 5328 resources which are a mixture of images, video and audio, text and learning resources taken from 10 different providers. Previews of each of these resources are available from the search results page.

![Figure 1 Screen grab from Smithsonian Learning Lab using search ‘ancient Egypt’](image)

There are also 13 Learning Lab Collections available. These are ready made resources and slideshows created by Learning Lab users and are classified by subject, age range and educational features.
Figure 2 Screen grab from Smithsonian Learning Lab using search ‘ancient Egypt’ filtered Learning Lab Collections

These collections contain images and other records but also contain teaching suggestions.

Figure 3 Screen grab from Smithsonian Learning Lab Collection about ‘Sarcophaguses and Coffins’

Search terms are specifically tied to US curricular requirements and so we would need to spend time thinking about what language UK teachers use when looking for content online. The ability for teachers and pupils to create and share collections and resources is to be admired as are the creation of participatory learning experiences such as the Quests. These learning experiences link well to the experience we currently offer school groups on-site where students and teachers are encouraged to document their visit using smart phones, cameras and tablets.
Figure 4 Screen grab of CultureStreet homepage

2. CultureStreet

The CultureStreet website brings together content created by Culture 24, CultureStreet and a wide range of external partners arranged along the themes of museums, art, books and stage. A wide range of content has been created for both teachers and young people and includes:

- Videos- ‘how to’ demonstrations, reviews of arts events by young people, workshop ideas
- Lesson Plans and teachers notes
- Curriculum links
- Virtual Tours
- Games
- Links to external sites
3. Teaching History in 100 Objects

The third site we planned to show teachers was the British Museum/Department for Education site ‘Teaching History with 100 objects’ [http://www.teachinghistory100.org](http://www.teachinghistory100.org) which brings together objects from museums across the UK and contains resources, information and teaching ideas. The resource is clearly linked to key stages, history curriculum topics and allows users to search by date, time and place. Each object has a set of resources sorted under the headings:

- about the object
- a bigger picture
- teaching ideas
- for the classroom
### 2.3 Review Summary

This review has examined the growing body of research now emerging from museums and cultural organisations both in the UK and US exploring what teachers are looking for online and how they are using what is already out there. It has highlighted the need for an ongoing consultation with teachers and students at both the design and prototyping phase and beyond.

Using Laurillard’s Five Level Framework, the review of existing research and evidence reveals that teachers look for:

**Narrative Content (content consumable ‘as is’ by the user)**

- Search optimised resources and metadata
- High quality images
- Preview option
- Subject relevance
- Ease of use
- Details on age suitability
- Copyright information
- Case studies useful

**Communicative Content (allows user to discuss and debate ideas)**

- Opportunities to share/participate in online communities
- Conversations between museum experts and schools

**Productive Content (allows the user to manipulate the object and discuss and demonstrate their understanding)**

- Flexible assets for use in multiple ways
- Ability to make their own collection of objects
- Putting interpretation in the hands of the learners
3. What We Did

3.1 Overview of the Consultation Project

Over January and February 2016 the project team visited 5 schools with a combined roll of more than 2500. The table below shows the characteristics of each of these schools.

<table>
<thead>
<tr>
<th>School</th>
<th>Size</th>
<th>Location</th>
<th>Type of School</th>
<th>UCM Visitor?</th>
<th>Pupil Premium?</th>
<th>No on the roll</th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>Small</td>
<td>Rural/Fenland</td>
<td>Primary</td>
<td>Non-visitor</td>
<td>Higher than average</td>
<td>63</td>
</tr>
<tr>
<td>School B</td>
<td>Medium Sized</td>
<td>Urban</td>
<td>Lower</td>
<td>Non-visitor</td>
<td>Higher than average</td>
<td>215</td>
</tr>
<tr>
<td>School C</td>
<td>Large</td>
<td>Urban</td>
<td>Primary</td>
<td>Visitor</td>
<td>Average</td>
<td>319</td>
</tr>
<tr>
<td>School D</td>
<td>Large</td>
<td>Urban</td>
<td>Secondary</td>
<td>Non-visitor</td>
<td>Below average</td>
<td>1056</td>
</tr>
<tr>
<td>School E</td>
<td>Large</td>
<td>Urban</td>
<td>Secondary</td>
<td>Visitor</td>
<td>Below average</td>
<td>898</td>
</tr>
</tbody>
</table>

Figure 6 Overview of the Schools Visited

We will refer to the schools in this way to protect the anonymity of the participants. We have taken some images of ICT use and of the sessions we ran with teachers but will not attribute them to individual schools.

3.2 Our Time in School

The visits each took a slightly different form based on the requirements of the individual schools but consisted of the following elements:

- In 4 of the schools we observed ICT use in a variety of different classrooms over the course of a school day
- The 2 secondary schools we visited had an iPad scheme in place which enabled all students to have their own device
• In 3 schools we interviewed senior management team about their schools’ use of digital technologies

• In 2 schools we led outreach sessions with children

• In 4 schools we watched staff use a selection of collections based websites and led object based training session with objects from UCM collections. We worked with a wide range of teachers of different ages and levels of ICT confidence and competence- from student teachers to those nearing retirement age.

Figure 7 Teachers Reviewing Websites

3.3 Overview and Project Statistics

• We observed ICT use in 32 lessons

• We led handling and storytelling sessions with 93 children

• Worked with 43 teachers and one trainee observing how they use collections based resources and then ran object based training sessions
• Looked at and discussed 28 images and handling objects from 3 UCM collections (MAA, Polar Museum and the Fitzwilliam) and a 3D scan from the Sedgwick Museum.

**Figure 8 Teacher Object Led Sessions**

### 4. Discussion of Findings

The time we spent in the schools observing their ICT usage was really useful as it demonstrated how the UCM resources we create could then be used by both teachers and pupils. We also watched teachers using the sites we had previously selected. This revealed how teachers searched for specific resources on the websites we were looking at, what challenges they faced and what works and doesn’t.

We also led object handling sessions with teachers. This has provided us with more rich data about what kinds of information they look for in relation to the different objects.
4.1 Overview of the ICT use across the 5 schools

In the classrooms we visited we observed ICT being used in a variety of different subjects. We saw lap tops, desktop PCs, ICT suites, iPads, interactive whiteboards (IWB), audio recorders and headphones, overhead projectors and visualisers being used. One secondary school was also piloting the use of a virtual reality headset in English lessons. Digital technology was an integral part of classroom teaching and learning. At primary level we saw the interactive whiteboard being used most frequently for either whole class or group teaching. At secondary level pupils used their own iPads in the majority of their lessons as learning became more individualised.  

Although it is worth noting that the two secondary schools we visited both had ipad schemes in place and are, therefore, not fully representative.
Figure 11 Observed Usage of ICT Primary Schools

Primary School ICT Usage
- iPad: 13%
- desktop: 13%
- IWB: 54%
- laptop: 21%

Figure 12 Observed Usage of ICT in Secondary Schools

Secondary School ICT Usage
- iPad: 75%
- desktop: 13%
- IWB: 13%
- laptop: None
4.2 Analysis of Website Usage

Only a very small number of the 43 teachers we worked with had used any collections based resources in a structured way. The only teachers who had used these resources were working at primary level. The sites they had used were the Museum of London14 and the British Museum 100 Objects site. Teachers had varying levels of confidence with regards to their use of the internet for searching, knowing where to click to find content and navigating their way around a site. Watching teachers navigate their way through the websites we showed them was very interesting. We took detailed field notes, recorded the interviews and reviewed transcripts from three schools.

During the analysis five main themes and threads emerged repeatedly. We have explored these themes below in order of the frequency with which they came up in the transcripts and our field notes.

1. Searchability

The most frequent topic of conversation in the interviews we transcribed was the need for easily searchable, well organised content, as discussed with reference to the Storythings and Smithsonian reports. We observed teachers looking for a general search box and information on topics and key stages. This was seen as been a very positive feature on the British Museum site.

*T1: But I like the fact it gives you choices. You can search for topic, you can search through a theme if you are looking for a particular theme.*

Quotes from interviews in school B

Teachers got frustrated by websites which took them to external sites without warning them, by pop ups, when it wasn’t clear where to click for more information, when there was too much information and when links were broken or slow. We observed teachers getting confused and lost in complex sites with too much information, particularly those which had lots of links to external sites. One group we worked with who started with Culture Street, went through to Show Me and then ended up on The Hermitage website. It took them several minutes to realise that the page they has landed on was in Russian. This frustration is apparent within the transcripts too,

*T5: I think I prefer it when it opens one after the other and you know what you’re following through as opposed to all these different windows, then you get lost with on you’re looking at.* Quotes from interviews in school B

*T10: It annoys me search engines which take you externally*

*T11: It doesn’t explain enough on the front page what you can do. You need an introduction.*

*T12: Better to see it then have a long of titles- you remember what the picture is.*

*T11: It needs to be split into order. KS1/ KS2 etc. I like things in order.*" Quotes from interviews in school A

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14 http://www.museumoflondon.org.uk/explore-online/our-games/
Sites which had a built in search engine powered by Google also created confusion. One group found themselves on an external office supplies site when searching for resources on their Viking project.

T15: We’re doing Anglo Saxons, shall we do Anglo Saxons
T16: Close some of your tabs

[pause, clicking]
T15: Shall we have a look? Or are we looking for something specific? [clicking]
T17: Investigate might...
T16: So it's museums, art

[pause, 10 secs]
[inaudible] in the thing...use google...let's Google
So [typing] excellent
T15: We’re doing the Vikings as well
T16: Shall we try Vikings? No results for Anglo Saxon
T17: Unless it means...
T15: Yeah
T16: Oh! Viking direct! [laughs] Not exactly what we were looking for! Um...Invaders and settlers. But then is that going to mean...

Quotes from interviews in school C

T15: I find if I don't find it within ten or fifteen minutes, I stop looking...
T16: Yeah I'm similar
T17: I'm the same
T14: Because otherwise you end up searching all night, don't you?
T15: You could do, yeah
T16: There's so much out there
T15: If it doesn't come up within the first page of Google, I don't look...I sort of think the most helpful thing would be if it was organised by learning objective, 'cos often you have to teach a certain learning objective, if you could look on a website... [T14: Like Twinkl15] like Twinkl now is and go ok that's my objective, what lessons fit that objective, I think that would be the most helpful thing.

Quotes from interviews in school C

15 http://www.twinkl.co.uk
The need for easily searchable content obviously relates to another theme; teachers are time poor and have little time to browse the internet to find content. However, it was also interesting to observe how difficult some teachers found using the digital resources we provided. We had assumed that all would be familiar with websites such as Pinterest and other image rich sites but this was not the case and several teachers struggled to navigate their way around the sites we showed them.

Lack of time to search for adequate resources came out again and again in all our interviews. Teachers moved quickly from item to item, often resting for no more than a few seconds on each section.

T5: But with this sort of, because of... I don’t find it easy to follow. If I didn’t find something quickly, I would leave the website [W: leave, yeah, I would]. Whereas if I felt it was going from one step to another I would be more likely to get to the end of the sequence.

I: If I wasn’t here you’d of left this by now?
T6: Oh yeah!
T5: Yeah yes, I think so, yes! [chuckles]

Quotes from interviews in school B

T9: ...You know it’s got to be easy, for me, it’s got to be easy to use, cos we’ve got to find something within about ten seconds and also, if there’s too much, I think, it will, just not work, cos you’ve got to keep going and keep going and keep going

T8: [they talk over each other, inaudible] Into google where it becomes so vast

T7: In art it’s quite good for the, I mean a lot of our sort of searches start off with google. Just type in whatever artist in and they have to sift through some of the websites.

Quotes from interviews in school D

T13: Oh it has got a lesson plan! Here!
T14: Role play cards, everything ready for it
T13: That wasn’t there initially though, was it?
T14: No
T13: It’s great that it’s there
T15: Hmm
T13: That’s really nice
T14: But it took us a while to find it, if it was
T13:Yeah... Do you know? If that was just me on my own I would probably have given up... [T14: Oh I would have done! Definitely] and not found it. But that actually looks like a really nice resource

Quotes from interviews in school C
As this quote demonstrates they gave the sites longer then they would have done if we hadn’t been there. There was also a sense of feeling slightly overwhelmed by the amount of resources available online.

2. Clear Visuals: Images are Valued, Used and Searched for

Teachers search for still images, videos, animations and 360 scans at all schools, ages and levels. There was a widespread understanding amongst teachers that using visual resources added interest and improved student engagement. Several schools also talked about presenting the same information in several different ways to appeal to different learning styles and build knowledge and understanding. One teacher spoke about starting with an image and then, ‘working backwards’ to cover different areas of learning. This view was echoed by the young people we spoke to in the schools we visited.

T2: I think the picture of the object somehow looking at that really clearly that’s a good starting point. If you can’t have the real thing, ‘cos nothing does beat the real thing.

Quotes from interviews in school B

T13: Pictures, pictures, because I find myself going to Google images [T14: Yeah] It’s the quick way of doing anything, you know, because then you can look and think oh it’s got a picture of that on that website, oh, I can go to that page now and find out more about it and if it has more on there. So I often start at the images and work backwards, rather than trying to look more generally about a website. That’s what I did with the Northern Lights. I just put ‘Northern Lights’ and then went to videos, went to images… found out bits about like that. [inaudible]

I: So would you use those images then on a power point, or…?

T13: Either on a Power Point or literally...

I: Do you export those images or is it more for your [inaudible]?

T13: Sometimes, sometimes I don’t even bother with that. You know, if I’ve got the google image search up on screen I will just say ‘look. Look at all these photos and look more widely.’ You know, assuming that it’s something appropriate cos sometimes you’ve got to watch out what’s in amongst all the other things, ah, but if you’ve got a full page of little thumbnails, the children can just see it all out there in front of them.

Quotes from interviews in school C

The internet connections in schools is not always reliable so teachers in School B asked for the ability to download and save images.

I: Would you want to download them or would you want them there on the site where you could have your own collection?

T5: I think I’d want to download them because if the internet goes [T6: yes] which is [W; yes!] highly likely, then you’ve got it, yeah

T6: I think if you had it downloaded, it, yes, because that’s quite [T5: flexible], it shows us really, because the internet is very [unclear]

Quotes from interviews in school B
This was also perceived as a useful feature to enable teachers to embed images and clips in their own teaching presentations and resources.

T6: They love an animation! They love a film! [T5: oh yeah!] [pause] Oh, but it’s not, is it loading.

T5: Yeah it’s loading. This is the best one so far! Well, we’ve only, it’s the second one!

[pause, video plays in background]

T6: Sometimes we have to be careful with the films. [M: there we go] Because they add, they make it, they try and make it humorous, but then they pick up sometimes the wrong bits of information, that’s the only problem

T5: And it’s good you can download it. Download pdf of objects. It would be nice if you could download all the pictures in one big go. So if it’s got a pack of iron age resources you can download all...

T6: Is that all the objects though, in that file?

T5: I don’t know

T6: It might be because it says ‘object file’

Quotes from interviews in school B

Video was cited as being a particularly useful tool. BBC video clips were heavily used at all Key Stages. Some schools had a firewall which blocked You Tube so video content was accessed in different ways.

At secondary level they were also looking for easily searchable content for use with their pupils.

T7: Well that’s my point, it can’t be too, it can’t be sort of five or six menus down because they won’t, they won’t do it. [T8: no, it’s got to be simple] The less able will just get lost within two clicks, if it’s not instantly accessible, kids won’t, kids will struggle [I: OK, so you have to], in my book

Quotes from interviews in school D

The teachers of the youngest children searched for resources which told a story.

T2: I think anything that’s a story. I think for younger children, in fact for all of our children, if you’ve got a story it makes it make sense

Quotes from interviews in school B

Many teachers we spoke to were excited by the possibility of using 3D scans of objects.

T14: You often find they’re not scaled though [T13: Yes, that’s true]. So it’s hard to judge the size of it. Um, ok. And nothing is 360 views, ‘cos you just get a very flat image and it’s hard to really picture it. It doesn’t look like that’s going to let you do a... 360 view. Oh it does give you the dimensions so you could almost measure it out and almost make like the template for it. Ok

Quotes from interviews in school C

This is an area which could prove very interesting for us to explore from a museum perspective as there is already interesting work taking place to create scans of 3D objects. Although teachers saw that these images had great potential to stimulate engagement they were unsure how to extend the learning beyond the initial ‘wow’ factor.
3. Trusted: Teachers look for Quality and Reliability

When looking at historical artefacts and other narrative sites teachers were wary of the reliability of the source. This was an interesting in the light of the fact that many of them were using Google and Wikipedia for their own research. Online resources were heavily used and sometimes paid for, although several teachers admitted that they are not always satisfied with the quality of what is on offer. This was one of the reasons they liked the BBC sites so much,

T1: Well I like the BBC [T2: The BBC is a really good website], the ones that are aimed for the children, the primary ones. Not that one that we just looked at [T2: no that was a grown up one] that was too much. The ones that have images that you can click on.

T2: Like Bitesize?

T1: Yeah. They seem more child friendly so you can use them.

T3: Thing is, we know as teachers, we've used them, we feel comfortable going round them and we know they hit the curriculum that we have to teach. Whereas for a lot of them they’ve got interesting things on there but it’s not that...

I: When you’re looking at websites, are you looking at things for you to use or mainly for the kids to use?

T4: For the teacher I need something that I can show them, so for them to access, I’d say it’s quite level, quite balanced

Quotes from interviews in school B

T2: Oh look! [pause] That’s good. . [pause 8 secs] Someone’s done a lot of work on this haven’t they. Oh what’s the article from BBC History? The BBC’s a really good website.

T3: Seems to take you to outside ones doesn’t it?

T2: But for a teacher, to kind of build up [T4: Their own knowledge] their own knowledge, that’s really good isn’t it because sometimes you just need to quickly know what you need to know

T4: Very quickly sometimes! Or showing them where to find the answer. That would give you loads. And books.

[pause 8 secs]

T4: Actually I found loads on the great fire of London that was recommended from other sites.

Quotes from interviews in school B

We saw BBC resources being used in the classrooms we visited at both primary and secondary schools.

At both primary and secondary level teachers were looking for resources they could use with their students as well as for their own research and lesson preparation. However, they often expressed their own lack of confidence in some of the topics and a fear of getting it wrong.
T7: Straight away that’s intrigued me, because actually there’s not, I was on it myself several years ago trying to make a bit of money by actually developing my own resources and actually how, you know, how whatever images, whatever could be used to develop a piece of artwork or something, because you never, you never see anything sort of useful online really, and even as a teacher you might even look on, um, on T.E.S., some of their resources and you know you often have to sift through loads of rubbish to find anything which is even remotely interesting.

I: You tend to build your own resources, do you?

T7: Yeah, yeah, yeah. But I mean having something which is, would be sort of specifically sort of art resources or PE, or how you can teach, and all you have to do is throw in a caption, how, how, how you can do that, you know, different

Quotes from interviews in school D

T7: The idea of having an area, the idea of having a website where the students and the teacher actually would know that, you know, for instant, University Botanica or Botanic whatever it is we’ve used that for sixth form, now if you just, you know, that or you know that’s going to be a decent quality resource, but actually having something which is like an art umbrella, that you know, specifically where you could look at like artists, you know, you could look at the artists at Key Stage, at exhibitions, at what’s currently on, how to paint things, and all this sort of stuff that would be fantastic if it was all under one umbrella.

T8: I mean one of the things which is a subscription one for GCSE in, it’s aimed at the kids, its’ easy to use, ups know (…) well you click on the trumpet and your hear an example… its really easy to use and it links to GCSE.’

Quotes from interviews in school D

This also links back to what the teachers were looking for in their searches, clear links to curriculum topics, key stages and GCSE requirements.

4. Adaptable Content and Activity Ideas: Digital Resources are Heavily Adapted

Teachers searched quickly to find images and information to embed within their lessons.

T5: Yeah and also, actually, I’m not, I don’t usually use a website that gives me a lesson. I’m not after a lesson plan. [T6: No]. I’m just after

T6: a video or a, or a…

T5: a video or something with lots of pictures. [T6: Yes]. So I want the resources to support my own lesson that I’ve got my own idea for [T6: Yeah, that’s what...] although it’s nice to have an idea. [pause]

T6: It’s nice to have an idea, if you have a video [T5: mm], what you could link it to [T5: Yes]. [5 mins] So, a suggested activity could be quite good. Cos it’s got that piece of persuasive writing [T5: yeah], that ‘could show them the above page’. Mm. Quotes from interviews in school B
How these resources were used depended in part on the level of ICT confidence of the individual teachers. One teacher would just bring up an image straight from Google images without exporting it. Another would cut and paste into presentation or word processing software. One school used Edmodo to create and share content and teachers were given extra time out of class to design and make their own digital resources. We also found that internet quizzes and pre-existing apps were heavily used at KS3 and 4. These included: Socrative, Photostory, Transum, QR Codes, Thing Link, BBC Bitesize, NearPod and TES. At primary level we saw SMART and CleverTouch interactive whiteboard software and notebooks being used as well as Scratch programming software.

5. Expertise: Teachers Need Guidance on Teaching from Images and Objects

In the five schools we visited it was clear that teachers were looking for support and guidance on how to work with objects and images. The head teacher in School B described this to us,

T2: People worry about how to introduce artefacts, maybe [you could have] some kind of demonstration. What you should have is somebody model it: here’s an artefact, here’s the questions you might ask to get the children’s juices flowing, how old it is? How was it used?”

She had some useful suggestions about how museum educators might support teachers to use any collections based resource that we created,

T2: Do you know what, having a video made, wouldn’t that be great for people to see? Particularly trainees. That would be really useful, then people would be confident picking up any artefact or a 360.

She was also clear about the power of storytelling to bring objects to live in the minds of the children.

T2: That’s a way in, isn’t it, for the museum, a really good story, a story that’s told on a smart board, that’s acted out, with sound effects. Or start with an artefact, and then ask ‘what story do you think this is?’ “[The objects in the Museum] only came to life when you told us about it, because you were there with the story, it brought it to life. Children love a story. I would have missed it all.

16 https://www.edmodo.com
17 http://www.socrative.com
19 http://www.transum.org
20 https://www.thinglink.com
21 http://www.bbc.co.uk/education
22 https://nearpod.com/index.php
23 https://www.tes.com/teaching-resources
24 http://home.smarttech.com
25 http://clevertouch.co.uk
26 https://scratch.mit.edu
In several of the primary school we saw displays created to prompt the children to ask questions. This related well to the activity we did with the teachers where we asked them to write questions around each of the handling objects.

![Whiteboard with Questioning Prompts from School B](image)

**Figure 13 Whiteboard with Questioning Prompts from School B**

In School B questioning was seen as an important skill which needed to be taught,

> *It’s important to teach children how to ask questions and which are the important questions to ask*

The school development plan in this school built on Ofsted recommendations to improve the quality of teaching to outstanding, by:

- questioning pupils more effectively to deepen their skills and understanding in all subjects

The secondary Art teacher in School D also described the need for guidance to find,

> *Certain prongs of questions I could apply to any image.*

Questioning also took a key role in the object handling sessions we led with the teachers.

We have been working for many years through our CPD and ITE programmes to encourage teachers to incorporate museum objects and enquiry based learning into their teaching on a day to day basis. UCM digital resources could provide an excellent opportunity for us to develop this work training teachers. There doesn’t seem to currently be any research that really unpicks the pedagogy behind how the best museum teaching can be replicated on a digital platform. We could potentially provide both an extraordinary bank of images and objects from the UCM collections and demonstrations showing teachers how to teach from them.
5. Summary and Recommendations

This study has demonstrated that the development of UCM digital resources for schools would present opportunities for us to reach and engage more people with our museums, collections and programmes as outlined in our Activity Plan. There is also the potential to provide inspiring opportunities for more children and young people to engage with the UCM. There is the potential to innovate in this area nationally as existing collections based resources are not well used and understood by schools.

Any digital resource that the UCM builds must start with our unique knowledge and expertise as museum professionals. Our work in the digital realm should be seen as an extension of what we already do, rather than something different. Resources should be designed as a ‘pick and mix’ offering and consist of a wide range of different content. Teachers, children and young people must be central to the design, ongoing review and evaluation of anything we create.

5.1 What do Teachers Want?

1. **Trust**: Teachers look for quality and reliability. Information must be accurate and there must be no issues with copyright.
2. **Expertise**: Teachers Need Guidance on Teaching from Images and Objects. Teachers want a basic set of information about the object and will not spend time wading through pages of academic or curatorial text to get the information needed.
3. **Searchability**: Teachers are time poor. They need clear information that is easy to access, well organised and clearly related to key stage and topics.
4. **Clear Visuals**: Images are highly valued and extensively used. Many teachers use images on an interactive white board (IWB) or projected on to a wall. The images need to be clear and good quality. If there are video clips they need to be short (less than 5 mins) and clearly narrated.
5. **Adaptable Content**: Activity Ideas NOT Lesson Plans: Teachers search quickly to borrow images and information to embed within their lessons.

5.2 Areas for Potential Development and Innovation:

1. The creation of a central **UCM schools platform** which contains the features listed above. This could contain information about existing resources and on-site provision but there is also the potential to design new content built around key objects and themes from each collection.
2. The creation of a **UCM teacher focus group**. This project has highlighted the need to consult schools, teachers and young people during the planning, development and testing phases of any digital resource we create.
3. The development of **3D scan based/ 360 degree photography** teaching resources building on work already taking place within the UCM and University more widely.
4. The creation of **more communicative digital content which encourages discussions** between teachers, students and museum staff.
5. The creation of **more productive digital content** which would allow the teacher or student to make their own collections and **create their own interpretations, narrative and responses**.
6. The **development of training materials designed to support teachers** to use museum images and objects in their day to day classroom practice.