**Alex Flowers**

**2010**

**MA Museums and Galleries in Education**

**Institute of Education**

**Report**

# "Impact of Empires: Using handheld digital technologies for contextual and collaborative learning in the museum"

# Contents

**List of Figures**

*Where extracts have been used from students' work, the names have been removed.*



**Tables**

# Chapter 1

**Personal Statement**

Mobile technologies present museum educators a powerful tool for in - gallery activities, taking advantage of collaborative web spaces, contextualised learning and enhanced motivation. This report sets out to explore how mobile technologies used in museum gallery learning sessions can facilitate discussion and collaborative learning. By using Diane Laurillard's Conversational Framework as a basis for designing and evaluating the project, the report will look at the following research questions:

- How do handheld multimedia technologies mediate engagement with artefacts and peer to peer communication within gallery activities?

- What evidence is there for technology increasing the motivation of students in galleries?

In my present role at Museum of London as e – Learning Assistant, I have the opportunity to develop sessions for a variety of audiences. The development of our secondary school programme for the coming academic year, 2010 – 2011, looks to use the recently re-opened galleries of Modern London extensively, opening up resources which have been out of bounds during the building works of the last 3 years. By using the rich collections available from Roman and Eighteenth to Nineteenth London, students will explore the ideas surrounding what empires are, how they operate and what influence they leave. The evaluation in this project will go towards developing and evolving my professional and academic knowledge, providing a chance for reflective practice and exploring ever changing uses of technology within education.

E – Learning in the museum sector is a recent development. As such, the amount of literature available is still slim, yet it is supplemented by variety of active online communities supporting the use of technology in museums. Groups such as Archives and Museum Informatics[1], the Museums Computer Group [2] and m-Learn [3] all perform

[1] http://www.archimuse.com/
[2] http://museumscomputergroup.org.uk/
[3] http://www.mlearn2010.org/

the role of meeting and discussion places for disparate professionals and researchers from across the sector and globe. Though I have endeavoured to keep the report jargon free, a glossary is provided at the end of the report to give clarification on any specialist terms or technical processes and equipment used. I hope that my research will go some way to adding to this growing body of work and provide some practical advice for those developing and evaluating in gallery activities using technology. The research here has taken a very pragmatic approach as I feel that it is possible to over – theorise and over - complicate without ever touching on the practical challenges that face this still developing area of museum work.

Over the last two years I have been extremely grateful of the guidance and support of my tutors and peers. Particular mention should go to Pam Meecham and John Reeve who have both shared their passion for the subject with wit, style and substance and without their infectious enthusiasm the course would have been a shade of what it was. A very big thank you also goes to Mariruth Leftwich, who from our first meeting at Museum of London was keen to share with me the work she was doing, supportive in my interests and whose enthusiasm for using technologies and collaborative working was inspirational.

# Introduction

## Blended Learning at Museum of London

The phrase "blended learning" has its roots in business training and has been a term which has attracted a number of differing definitions. [4] The Museum of London uses the term to describe the mixing of pedagogical approaches in its learning programmes, especially those associated with e-learning. The approach to developing programmes around blended learning has been to mix new technologies into learning sessions which fuse together face to face instruction and guidance with the possibilities granted by none traditional uses of collections and galleries. This approach enables recording, manipulation and sharing of collections and digital products which allow visitors to begin to create their own meanings from the museum's holdings.

Here, blended learning will be concentrated on in reference to e – learning. As the term e-learning can attract a number of definitions, it will be defined in this case as learning which is supported by the use of digital technologies. At the Museum this covers a number of programme areas. The museum provides a number of online resources for visitors, students and teachers through the website. These include games, fact packs, downloadable tours and interactive whiteboard resources. The term also covers video conferencing which is used to take the Museum "off - site". Schools can book sessions and while the actors and objects are located in the museum, groups can interact with both from their classroom, wherever this may be. These sessions have proved highly popular and enable the museum to reach groups not only in parts of the UK where visiting the London site may be difficult, but also overseas in locations as diverse as the USA and the Middle East, as well as providing access for hospital schools and SEN groups.

On site, e – learning takes the blended approach. It supplements more traditional museum education approaches, such as object handling and role play, with digital technologies used for interpretative activities. Blended learning aims to provide a variety of ways to approach a subject, catering for varying learning styles, motivations, abilities and ways of accessing the collections. Examples of approaches taken include:

4 Garrison and Vaughan (2008), pg. 7 - 9

- Primary school groups using simple cameras and film editing technology to create films of their journey around the gallery whilst role-playing the historical characters they learn about along the way.
- Secondary schools meeting curators from the museum and learning about collecting primary evidence from handling collections and then creating a digital exhibition from research and photographs taken in the galleries.
- Adult community groups using film equipment and the computer suite to create a walking tours of the City of London and learn basic computer and internet skills.

The programmes offered support national priorities and plans for digital literacy. Digital literacy is a growing concern for the government as the country gradually shifts its focus from industry and manufacturing to an information society. [5] Understanding and knowledge of digital technologies has been closely linked to economic well being, so much focus has been placed on providing ways into technology through free training for adults and placing digital technologies throughout the curriculum within schools. There are many bodies advocating the full integration of ICT in schools, such as Futurelab, who say:

*"Indeed, if formal education seeks to prepare young people to make sense of the world and to thrive socially, intellectually and economically, then it cannot afford to ignore the social and cultural practices of digital literacy that enable people to make the most of their multiple interactions with digital technology and media."* [6]

This statement makes some headway into appreciating the effect of digital technology on people's lives. By acknowledging that it enables "social and cultural practices", these technologies become more than utilitarian and entertainment entities and it establishes ubiquitous technology as both a standalone devices and communication tools for products of the above practices. However, it can be argued that the statement does not go far enough in pushing a holistic view of technologies and their uses in everyday life. A reversal of the statement, and one which may be more appropriate, might be that the social and cultural practices of digital literacy enable people to make the most out of their multiple interactions with *the physical environment and other people*.

---

[5] DCMS (2009), pg.1
[6] Hague and Payton (2010), pg. 3

*Figure i - Left, History Pin and right, Museum of London, "Street Museum", showing Suffragette Emily Pankhurst being arrested outside Buckingham Palace*

Though this may be a radical statement, it does point towards the ways in which technology draws people together through social sites and collaborative projects and the way in which augmented reality mobile technologies, such as the Museum's own *"Street Museum*" or the commercial *"History Pin",* are layering digital representations of the world, either user generated or otherwise, over the physical environment as mediated by digital devices. History Pin is quite forward in pushing this as key to its purpose, saying, *"What's nice is that when they're using the site, loads of people will be spending time with someone from a different generation. Older people have attics full of old photos, younger people know when to click and when to double click."* [7] This approach to intergenerational learning and support is something which can be seen in the families and communities programmes at the museum, where younger people can often teach ICT to their families, reversing the common generational roles, whilst the older members of the family come with knowledge and experience of other things.

E – Learning at the museum aligns itself with national priorities such as DCSF's, *"Towards a Unified e-Learning strategy*" (2003) and BECTA's *"Harnessing Technology for Next Generation Learning: Children, schools and families implementation plan, 2009 – 2012".* These papers form a larger part of a central government strategy as outlined in, *"Digital Britain*", (2009), which is part of the Digital Economy Act, put together by DCMS and the Department for Business, Skills and Innovation (BIS). The report and act set out the plan for Britain's digital future, not only in terms of infrastructure, such as universal high speed broadband connections and liberalising 3G mobile data networks, but also in

[7] http://www.wearewhatwedo.org/pages/historypin/

terms of literacy training and the curriculum. The bill, though much needed in recognising Britain's failings as a high tech nation, has also attracted much criticism, including the rushed passing of regulation on copyright infringements in the last days before the Labour government lost power. The criticism, coming from both communications companies and the public, points to the growing infringements on personal privacy, the impossibility of monitoring such actions and a lack of engagement with what the internet and digital technologies allow users to do in terms of modifying copyrighted material for their own use and sharing such products freely. [8] The complications and fear of copyright and Intellectual Property Rights being broken and an unsteady understanding of how the internet has exploded the modification and copying of material is something which does affect the museum. As the e-learning programmes use copyrighted material from the galleries, such as photographs of objects, substantial work has been done to minimise risk. [9]

**Theoretical Underpinnings**

E – Learning at the Museum of London is underpinned by constructivist theory. Sessions encourage the development of personal digital products through open ended sessions, encouraging active learning and reflective collaboration. The flexibility enabled by using digital technology allows for these products to be the conclusion of a study where learners have been encouraged to take their interests and develop them around the subject at hand.

Constructivism in the museum has had an effect in not only education but also in the design and curating of galleries and exhibits. As the post – modern condition stipulates that truths and facts are manifold and unstable, so the very galleries of the museum, once temples of academic authority, become open ended, questioning rather than telling and non – linear rather than sequential. As in e – learning, the concentration should always be on learning outcomes and the collections rather than the technology itself, it is understandable that the foundations affect the structures growing from them.

George Hein describes the constructivist museum, which has few real world examples but many echoes of its influence, as, *"…designed so that multiple paths are possible throughout*

[8] Arthur (2010)
[9] Leftwich (2009)

*the exhibit and the learners (visitor) is provided with a range of modalities to acquire information,"* and, *"…exhibits (which) have no fixed entry or exit point, allowing the visitor to make his or her own connections with the material and encourage diverse ways to learn."*[10] This description of the constructivist design in galleries can be re – interpreted as a metaphor for the museum learning. The subjects to be investigated are at hand in physical form often, through galleries or collections, and the way into these subjects is left open enough for students to find their own place within them. Under the constructivist paradigm, visitors will leave the museum having constructed their own meanings from the exhibit, independent of the museum and perhaps even diametrically opposed to interpretations given by the institution. The openness of outcomes from the museum visit has been adopted by some museum professionals who see it as a method to create an egalitarian and democratic public body that mirrors and reflects upon its contextual society and peoples in all their multiplicities and diversity. [11]

It is unlikely that Hein, when writing the above statements in 1995, could have imagined the revolution that has come with advent of digital technologies in museums, learning and galleries. It is now possible for visitors, physical or virtual, to curate their own online exhibitions, leave feedback in gallery exhibits and even form part of the exhibit with their own interpretations. The Natural History Museum, for example, is now using Smart Ticket technology in their Darwin Centre which allows visitors to scan their entry ticket on exhibits saving them for later where they can be organised, researched and curated on a website. [12]

---

[10] Hein, (1995), pg. 5 -6
[11] Weil (2002)
[12] http://www.nhm.ac.uk/natureplus/index.jspa

# Chapter 2

## Impact of Empire Study Day and M – Learning Gallery Activity


*Figure ii - The Roman gallery at Museum of London*

The Impact of Empire study day forms a part of the Museum of London's secondary school programme. The day takes advantage of the Museum's collections which represent London as a both subject and ruler within empires. Using the extensive Roman collections at the museum students will be able to explore how, as a province of the Roman Empire, native British culture was defuse, displaced and generative of new forms of living under Roman influence. Likewise, with collections from the Seventeenth century onwards, students will explore how London's role at the centre of the largest empire in history irrevocably altered people's lives and how its legacy still resonates today.

The day consists of three sections which enable exploration of different curriculum areas and offer the opportunity to engage students with different learning styles. The three activities, which occur in no particular order on the day as there is often more than one group and these switch between activities throughout, are object handling, live drama or a question and answer session with a man who arrived in Britain aboard the Arcania ship from the Caribbean and the e-learning component in the galleries. The separate activities are there to support each other and aim to support students' knowledge and understanding of empires as the day goes on.

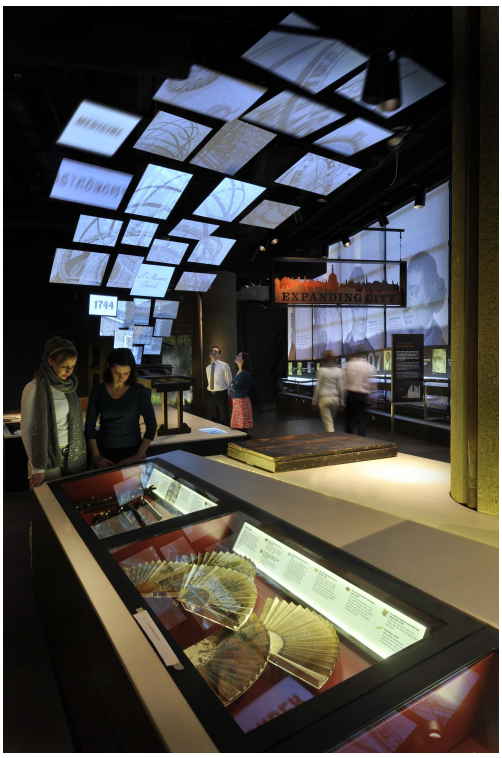



*Figure iii - Expanding City 1666 - 1850s at Museum of London*

**Object Handling**

Students are given the chance to investigate how empire affected different aspects of London life, shaping the city that is existence today and reflecting on how it affects their lives. The first part of this workshop uses original artefacts to explore how the London area was changed by becoming part of the Roman province of Britannia. Students then assess the benefits Roman occupation brought to the original inhabitants of the Thames region as well as the disadvantages.

The second part of the workshop uses 19th and early 20th century images and objects to compare the impact of the British Empire on London. Finally, students are encouraged to draw links between the two empires and their lasting legacy in order to help them understand how London came to be the world city it is today.

**Windrush Drama**

In the drama students are given the chance to meet Walter Williams, who travelled to London in 1961 on the *SS Arcania*, following the same route as the *SS Windrush* and carrying the same aspirations as many of its passengers, to make a new life in England.

His personal story will help students to explore the issues of migration to Britain from other parts of the empire and look at racism and hope in creating the multicultural society we have today. Throughout the session students are invited to take an active part in the story and take the opportunity to learn about a large scale event which altered Britain in a national and international way.

This session takes advantage of the recent redevelopment of the museum's "Galleries of Modern London" which were opened in April 2010 after three years of work as well as the newly built Clore Learning Centre that holds the education spaces and e – Learning Studio. The redesigned galleries updated the displays of the previous collections which had been untouched since the museum's opening, almost thirty years ago.

This redesign has enabled the museum to take a fresh approach and really tackle some of the more pertinent issues in the city's history. More controversial issues such as the role of slavery in the growth and wealth of the city, the success of far – right political movements in the 1930's and the roles of all involved in the Brixton riots throughout the Eighties and Nineties. Jonathon Swift said, "It is the folly of too many to mistake the echo of a London coffee-house for the voice of the kingdom." [13] The multiplicity of voices apparent in this quotation and similarly in the history of London, have to be addressed in the galleries of the museum. By bringing together personal testaments along with the museum's own written interpretations in the galleries, these diverse views on the history of the city come together to begin to mirror the demographic and social make – up of the city itself.

**Curriculum Links**

The study day supports the following areas of the curriculum in Key Stage 3 History and Citizenship.

**NC History KS3**

**f.** the impact through time of the movement and settlement of diverse peoples to, from and within the British Isles.

[13] Swift (1711) in Miller, S. (2007), pg. 100 Miller, S. (2007)

**h**. the development of trade, colonisation, industrialisation and technology, the British Empire and its impact on different people in Britain and overseas, pre-colonial civilisations, the nature and effects of the slave trade, and resistance and decolonisation.

*Curriculum opportunities:*

**a**. explore the ways in which the past has helped shape identities, shared cultures, values and attitudes today.

**b**. investigate aspects of personal, family or local history and how they relate to a broader historical context.

**NC Citizenship KS3**

**i**. the changing nature of UK society, including the diversity of ideas, beliefs, cultures, identities, traditions, perspectives and values that are shared.

**j.** migration to, from and within the UK and the reasons for this.

In regards to the presence of the British Empire being studied in depth in the history curriculum, it is perhaps fortunate that this has become a contested issue over the recent months with the arrival of a new Conservative government. The nature of the Empire and its achievements and failings is contentious to the point of extreme in British education. The re-evaluation of the past "glory" of the Empire, the impact of post – colonial theory embedded into standard academic studies and mass media and the explosion and naturalisation of diverse peoples settling from the Commonwealth in Britain begs the question of how the subject is dealt with in a balanced manner and takes into account those whose heritage comes from the flip side of the Empire's power. Alongside gender, race and culture studies as tools of analysis, the history and dominance of the Empire has been deconstructed time and time again, fragmenting its narrative into many shards.

In museums there has been much headway into confronting the beliefs that the Empire and many of the national museums were built upon. When Cecil Rhodes commented that, "the British are the finest race in the world, and the more of the world they inhabit,

the better it will be for mankind", it would be doubtful that he would recognise any of the inclusive and acknowledging approaches taken by museums now in giving voice to the "other". These hugely important inroads have changed collections and curatorship irreversibly over recent decades. But again, returning to education, how can this dialogue be stimulated in the classroom or museum education, and to what message is it pointing, if any?

David Cannadine argues for the view that Britain should be placed at the heart of the reading of the subject. As a central hub for both goods and people, it also sat at the centre of the imagination for the people of the Empire in terms of aspirations. The connected nature in terms of the Empire's interactions in economics, culture and political spheres should ensure that it does not exclude the periphery though, as it is here that the controls and narratives of the Empire come from. [14]

[14] Cannadine (2001)

# Chapter 3

## Developing the e - learning activity

A number of approaches were considered for the development of the activity. There were a couple of key elements that it had to involve. Firstly, that it used the iPhone as its platform. This was because the department had acquired a set of iPhones which had not really been used to their full potential yet. Though they had been used for their cameras and sound recording capabilities, their networking potential had not yet been used. Secondly, that the programs used had to take advantage of "location awareness", knowing where people were and subsequently being able to deliver content accordingly. This threw up a number of possible solutions, but also a number of challenges. Thirdly, due to budget constraints, it had to be free to develop and software should preferably be open source to ensure that it could be modified as needed. Lastly, it should offer something unique and different that distinguished itself as a non – traditional gallery trail, offering unique possibilities with digital media. All the approaches considered allowed for non – linear exploration of the galleries. This was important, not only to ease congestion around the exhibits, but also in our thinking of allowing free associations and explorations of the theme at hand.

Adopting technologies meant for consumer use often means that workarounds have to be found and the existing hardware and software adapted to educational requirements. This is often apparent in e – learning where software and hardware are often used in ways that the device was not necessarily designed for. Mobile phones are usually used on a personal basis, which is the user has a one to one relationship with the technology, customising it and using it for their own means. As the activity would be running through the iPhone's own interface, it meant that it would have to be made as simple as possible for operation by unfamiliar users.

*Figure iv - Approaches considered for Impact of Empire Gallery Trail*

| | | | |
|---|---|---|---|
| **LAYAR** | An augmented reality app allowing designers and users to GPS tag locations and access information and multimedia on site. | - Augments physical spaces through digital means allowing for a rich interpretive environment.<br>- Well supported platform.<br>- Free.<br>- Context aware.<br>- Pushes technical possibilities of the activity. | - Not possible to have user feedback incorporated into its use.<br>- Difficult and time consuming to set – up.<br>- Public, access open to all. |
| **SCVNGR** | Uses GPS to set tasks and problems which are found via a map, users then add responses using the app. | - Allows for multimedia responses such as video and photo.<br>- Everything done "in – app".<br>- Free. | - Poor developer support.<br>- Inaccurate GPS tagging – difficult to exactly locate objects in galleries.<br>- Public. |
| **GeoCaching** | A global game where users hide physical clues in locations which then lead to other places. | - Well supported community platform.<br>- An exciting mix of physical and virtual.<br>- Enables a variety of approaches with physical clues.<br>- Free. | - Serious security concerns over public nature of the platform and with leaving physical clues in public spaces – may cause alerts.<br>- As it is an open public base it may be modified by other public users.<br>- Some poor GPS errors in the galleries. |
| **QR Codes** | 3D QR Codes which when scanned, link to a website. | - Easy to set – up.<br>- Can be designed to cater for own needs.<br>- Enables multimedia content.<br>- Can add user generated content.<br>- Context specific.<br>- Content can be made private.<br>- Allows post – activity access to content.<br>- Free. | - Requires QR codes to be positioned in galleries.<br>- Necessitates use of more than one iPhone app. |

*Figure v - An example QR Code. When scanned by the iPhone this will lead to a webpage and activity on imports in the British Empire.*

*Figure iv* details some of the main approaches considered for the trail. Some were developed in rough stages as tests and others fell before the first hurdle. As there were time constraints on its development, less than a month and running alongside other sessions and programmes, it meant that it had to be reasonably easy to set up and maintain. LAYAR appeared to offer the most exciting solutions to the task ahead, being able to overlay information and digital representations of objects over real-time views of the galleries via the iPhone, but its set up time was considerably longer and the process more complicated than any other approach. SCVNGR (pronounced Scavenger) seemed to offer an exciting solution with context awareness and multimedia user - generated content but support from the developers was poor as they were releasing a new version of the software and undergoing a major restructuring of the website. A test trail was quickly developed and tested in the museum, but it was found that its method for tagging locations with GPS was less than accurate, especially for things as specific as objects in cases. The GPS problems returned again when testing GeoCaching, possibly due to the Museum's thick walls and almost subterranean lower galleries affecting the signal to the phones. There were also serious concerns over the security of GeoCaching, which asks users to place physical clues on locations which others are then led to by digital maps. The possibility of having the public leave containers with clues in the galleries would lead to the possibility of emergency evacuations of the museum.

The approach take in the end was to use QR codes to link exhibits to web pages accessible through the iPhone (*Figure v*). QR Codes operate in the same way as traditional barcodes, using black and white patterns to hold information that can be interpreted

*Figure vi - QR codes in "Gene Sherman Contemporary Japanese Fashion" exhibition at the Powerhouse Museum, Sydney, 2009*

with software, but they can hold greater amounts of data. In this case they were used to hold web addresses, which when scanned with "QR Reader", an app on the iPhone which reads the codes and then automatically executes their held data, would lead to a blog page. By using this, it was possible to set up non – permanent codes in the gallery which were affixed to cases prior to the start of the activity which would then lead students to the relevant online content.

There have been a number of previous experiments by museums with QR Codes but many have remained as just that. Doyle and Doyle (2010) looked at using QR codes at the Hood Museum of Art at Dartmouth College for a handheld smartphone tour which followed conventional design, enabling on request information about a given object. At the Powerhouse Museum in Sydney, QR codes were used as object labels which forwarded visitors to web pages with further reading (*Figure vi*). The codes required people to use their own phones rather than any museum supplied device. Though this is quite uncommon at the moment, recent research suggests that museums see this as the coming trend in museum handheld interpretation. [15] From these experiments at the Powerhouse came a number of important practical issues. Firstly, lighting is of great

[15] Petrie and Tallon (2010)

importance to ensure that the codes can be read properly. As the reader uses the phone's camera, it is like taking any photograph: if it is to dark the image will be blurred. This proves a difficulty in galleries where light levels are often low. In the first test of the activity with two student teachers, we noted which codes were difficult to read on certain displays and moved them to better lit areas of the case. Secondly, in order to make the codes easier to read, the web addresses must be shortened from their full length to a shortened URL. The result of this is codes with simpler patterns making them easier to read by the phone:

*For example:*

http://impactofempire1.wordpress.com/2010/06/16/expanding-city-clue-2/

*to*

http://wp.me/pXIJ5-r

The web pages were designed in Wordpress, a free online blogging site, which is optimised for viewing on mobile devices such as phones. A blogging site was chosen as it allows visitors to add their own comments and media onto the page once they have accessed it. These additions can be made private by the web page creator, which would mean that it would protect student's identities and work can be accessed only by those knowing the exact web address. As all the work is published onto a website, it means that teachers can access the work back at school and even use it as an interactive whiteboard presentation to generate discussions and revisit the issues explored in the galleries.

**Designing for accessibility**

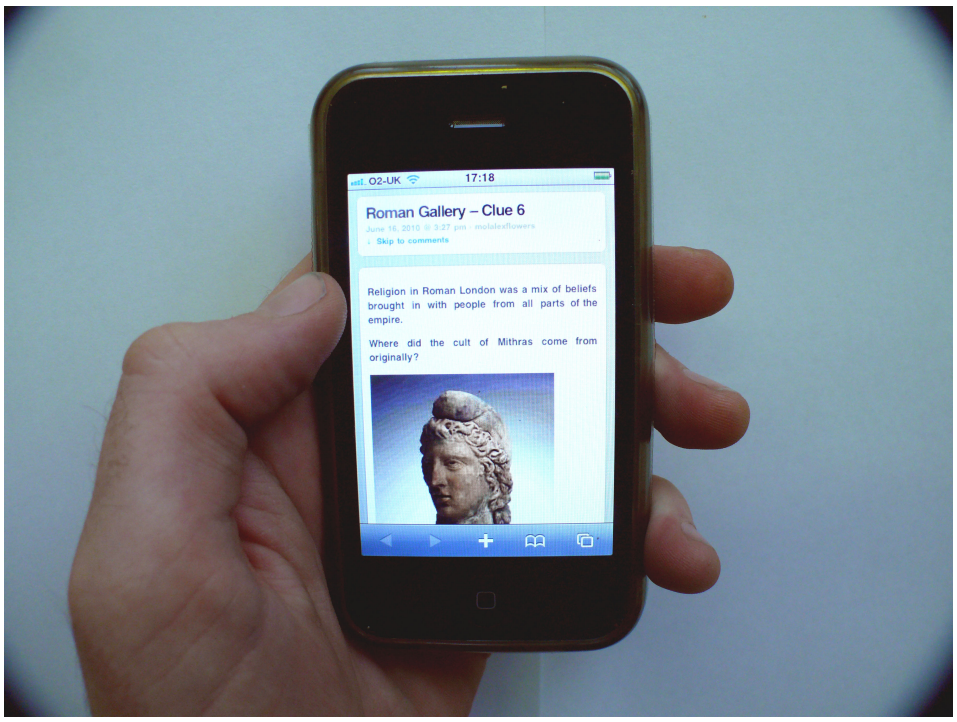



*Figure vii - Example mobile web page for the activity.*

Providing access to the activity for students who may have difficulty using the iPhones due to vision impairments or motor difficulties proves to be a challenge that is hard to solve. It is important to use technologies to remove barriers for learners and recognise that, for others, they may create them. [16] The iPhone has a built in virtual magnifying glass that users can move over the page increasing the size of onscreen writing. This was enabled on all devices and pointed out to students at the start of the activity. Motor difficulties prove to be more difficult to solve for handheld devices due to the size of them and inherent portability. As the iPhone is touchscreen operated it means that any controls or buttons can be resized to suit the user. However in designing the webpage there was an issue as the Wordpress blogs used had little functionality to enable this. In a worst case scenario, a student having trouble using the activity would have little option to do the activity in paper form, which was also prepared as a backup. This does however create an exclusion from the activity and remove the unique potentials of using the technology from the activity.

[16] Dawson (2007), pg.48

# Chapter 4

## Theoretical Frameworks

*"Day by day our hectic lives erode our capacity for deep focus and awareness, so much so that I often wonder whether future generations will even experience the hard-fought pleasures of engaging deeply in thought and conversation.*

*Will focusing become a lost art, quaintly exhibited alongside blacksmithing at the historic village ('Look, darling, that man in twentieth-century costume is doing just one thing!')? How did we get to this point?"*

Maggie Jackson, 2008 [17]

The scare stories which surround the recent development of ubiquitous computing often neglect to explore how it has revolutionised learning, access to information and communication. The above quotation comes from an article from a major British newspaper entitled, *"Information Overload: Switch off your mobile, iPod and emails – technology is turning our brains to mush"*. The fear that we as a society, especially the younger generations, are being turned into cyborgs with nano – second attention spans is a common theme in such stories and yet technology is being touted as a key way in which to engage and motivate teenagers in their own self – directed learning. There is a substantial body of research which demonstrates that technology can provide unique qualities in classroom and non – formal learning environments and it is this which shall be drawn on to examine how it can be harnessed to enhance learning experiences.

The development of the Impact of Empire e – learning section was formed around a number of learning theories and frameworks which informed its elements and implementation. Though some of these following theoretical frameworks generally inform the directions of the Learning department as a whole, such as constructivism,

[17] Jackson (2008)

some were used much more specifically to develop the Impact of Empire iPhone activity as they directly related to the opportunities opened up by the use of the technology.

One key theoretical framework was that of Diana Laurillard (2007) as set out in her paper, *"Pedagogical Forms for Mobile Learning: framing research questions"*. The "Conversational Framework" set out in her paper aims to look at the relatively immature nature of mobile learning and propose a framework which not only lays out guidelines for developing sessions which harness the situated and collaborative learning facilitated by mobile technologies but also establish a framework around which these activities can be evaluated with an eye to further development.

Laurillard firstly attempts to distinguish some of the characteristics of mobile learning from other types of learning. Acknowledging that the types of mediation between learners and subject may have crossovers with other types and technologies of learning, she pulls in other thinkers around the area to identify any proposed unique characteristics. Calling on John Cook, she acknowledges his differentiation between "user generated content" in Web 2.0 products and the "user generated context" in which mobile technology users define the site which they are in through their own content. [18] Central to this is the idea that mobile learning allows for situated learning, in which the collaboration and communication between users using the technology in the same context, for example as part of a museum tour or session, can begin to impinge their own interests, thoughts and group identity upon the site they are in, as mediated by the technology. This could include setting routes for each other through spaces, coming into contact with other people's interventions on exhibits, for example, comments or video. These "extras" to the museum – generated content of the museum designed technology or interface are accessed in a non – linear manner, driven by the desires of the user. [19]

Neill Winters also picks up on this multiple layering of information and authorities of voices by arguing that mobile learning involves added mobilities in learning which are enabled by mobile technology. [20] The three spaces in which learners, the subject and technology are all situated within are as follows:

---

[18] Laurillard in Pachler (ed.) (2007), pg. 155
[19] ibid , pg. 155
[20] ibid, pg.154

*Regional Space* – The physical space in which the learning takes place e.g. gallery or classroom.

*Network Space* – The social space of participants and technology.

*Fluid Space* – The interchangeable space of learners, relations and the object of learning.

These three spaces are not necessarily defined exclusively to learning in which mobile technology is a part. Kakihara and Sørensen (2002) suggest similar spaces in m-learning are more inherently tied to these unique characteristics rather than applied solely to human movement. [21] But here, greater importance is placed on the physical space of the learning, something which is particularly important when considering within the context of museums, as it is often repeated that, the collection comes first. The learner is placed within a digitally facilitated space in which the network of users and the digital representations refer back to the physical. Traxler (2007) argues that these networked spaces and the ubiquity of augmenting the real with the virtual is part of "…a new mobile society", which delivers just enough information as is needed when it is needed. [22]

Both Cook and Winters point towards the unique characteristics of mobile learning differentiating itself from "tethered" e-learning, that is desktop computing, while simultaneously sharing with the characteristics of it. These include the opportunities afforded by e-learning in concern to personalisation, engagement and inclusion, active control over learning and ownership, which is construction, of outcomes and products. [23] Mobile learning on top of these, can offer learners situated learning and activity, as well as continuity between contexts, for example, between gallery mobile activity and investigation of a physical space and post – gallery classroom activities using the products of the situated work.

The Conversational Framework, therefore tries to incorporate these previous points and characteristics into its theory, to try and encapsulate the mobile learning experience. It advocates a dialogic approach between students and teachers, where the teacher "frames" the experience, but where students take control and ownership of the subject and begin

21 Kakihara and Sørensen (2002) in Kukulska-Hulme, Sharples, Milrad, Arnedillo-Sánchez, Vavoula (2008), pg. 8
22 Traxler (2007), pg. 5
23 Laurillard in Pachler (ed.) (2007), pg. 156

to frame each others work, peer to peer. Their actions as a result of the mobile learning taking place then goes on to inform participants own notions of their work, essentially pitting learners against each other, where each member of this mobile network modifies their work and thought against the backdrop of physical space and context of other learners' content.

There are therefore two levels of dialogue occurring within the framework: discursive and experiential. The discursive dialogue focuses on theory and concepts of the subject at hand and the experiential dialogue occurs within the practice and activity. Both of these dialogues are interactive and user based, that is, they can be modified by the participants as the activity goes along and as the dialogues evolve. The framework can then be considered to have a constructivist basis where each level informs the other, theory informing practice and vice versa.

Laurillard proposes that to motivate participants in the activity, certain design elements of the session should have reflective and dialogic elements. By making it clear that the theories learnt can be used to achieve a goal, incorporating feedback as intrinsic to the activity and creating a final piece of work or product which reflects on what went before, the activity will acquire more meaning and have clear pedagogical goals. These, she argues, will be supported by peer to peer collaboration if it is designed as integral to the activity. This can be sharing outputs and reflections on the activity which lead to discussion which can also be a motivating factor in improving individual practice. [24]

In the activity developed for the Impact of Empire iPhone trail, these motivational pointers were adopted and incorporated into the practice and design of the session. A clear goal is established and set up at the start of the session, to investigate the galleries and look at the collections on display and how they demonstrate the various impacts that empires have had on London as city in the past and in the present. Feedback and discussion is built into the activity in a number of ways. Firstly, it is facilitated by the nature of the technology used. As the students can look at each others comments and answers on the mobile web pages on the phones as they explore the galleries, they can consider other people's responses as well as there own and the ways in which they came to those conclusions. By creating the facility for students to set each other the riddles in the galleries it provides an optional opportunity for discussion, personalisation and

[24] Laurillard in Pachler (2007), pg. 161

reflection. There is also an opportunity for discussion post – visit. As all the students work is stored on a web page, this can be accessed back at school and can form the basis for activities in the classroom looking at students' responses and interpretations of the galleries and objects. The idea that there is a takeaway product from the session seeks to reinforce the experience of the galleries and encourage reflective thought after what is quite a packed day of various sessions. Laurillard points to the idea of a conclusive e-product which is collaboratively produced as a major motivating factor in the design of activities. [25]

In the original design of the session the final part of the activity was an interpretive task which asked students to consider which object they encountered in the galleries would most represent the idea of empires for them. Due to time constraints, this was eventually dropped from the activity but with the constant re-evaluation of the session and timings, it will be re-included as an essential step, a pedagogical conclusive product and goal to be reached.

The area of e – learning and mobile learning in museums does not have a large body of research behind it and as other areas of learning in museums do have. As the area develops inline with pedagogical theories and technologies, the two often pull at each other and are reactive to the possibilities offered in developments. The handheld computing technology used evolves rapidly with power, so the possibilities for taking the advantages of e-learning into contextualised and situated deployments grow. Due to the overlapping of function and use, the unique characteristics become ever more blurred, yet the potential for mobile learning in museum contexts brings with it some unique opportunities for looking at ways to improve visitor engagement with collections and gallery activities.

Mobile learning in museums could be considered to have a long history and one which have proved so successful as to have embedded itself in the majority of museums today. The idea of using technology to allow visitors to integrate themselves in to the museum's meaning making processes has roots in the beginnings of audio tours. The first audio tour developed by a museum was at the Stedjelijk in Amsterdam, under the directorship of Willem Sandberg, in 1952. [26] He is credited with being a pioneer of revolutionising the

[25] Laurillard in Pachler (2007), pg. 166
[26] Tallon in Tallon and Walker, (2008), pg. xiii

manner in which museums had to pay more attention to the visitors' modes of interpretation and their relationship with the processes occurring in the museum to make sense of the objects on display. This early use of technology in museums, called "Short Wave Ambulatory Lectures", delivered discussions on artworks via shortwave radio which were picked up by radio handsets worn by visitors as they "ambulated" the galleries. The lectures were delivered in four languages, broadcast from four tape machines running on loop. This meant that visitors would often stumble into the middle of a lecture and wait for its completion and eventually due to the timings, large groups would end up moving simultaneously en masse through the museum. This came to be solved with further developments in audio technology such as personal tape players and CD players, which allowed random access, that is visitors could choose what to listen to and when. The portable vinyl record player proved difficult for visitors to use and too cumbersome to carry in the galleries, but nonetheless, was adopted by some for a period. With the advent of digital handheld devices, tours developed into multi-media experiences providing audio alongside video, games and layered access to information.

Handheld digital devices can presently offer these "top down" tours on devices supplied by the museum, but can also offer many more networked experiences allowing for "bottom up dialogue" and user – generated content. The networking allowed by these devices, that is peer to peer communication, creates an interesting scenario for museums and an interesting experience for the users of such technology. For the transmission of information museum visitor tours are often however reliant entirely on the museum voice; curators and field experts. The most likely "other" voice that will be heard is usually from a source community representative, such as in the present tours at the British Museum, who provide time on the multimedia tour to speak about process and meaning behind the piece.

This top down approach ensures a certain standard of material that while not being an the interactive experience that might be expected of a Web 2.0 audience, is still informative, well produced and relevant. However, in a learning context, following the lead of Vygotksy, it is the social element of learning environments which provides the necessary stimulation to take in and reform information. This is why communication and user involvement with the Impact of Empire gallery activity is central to the research.

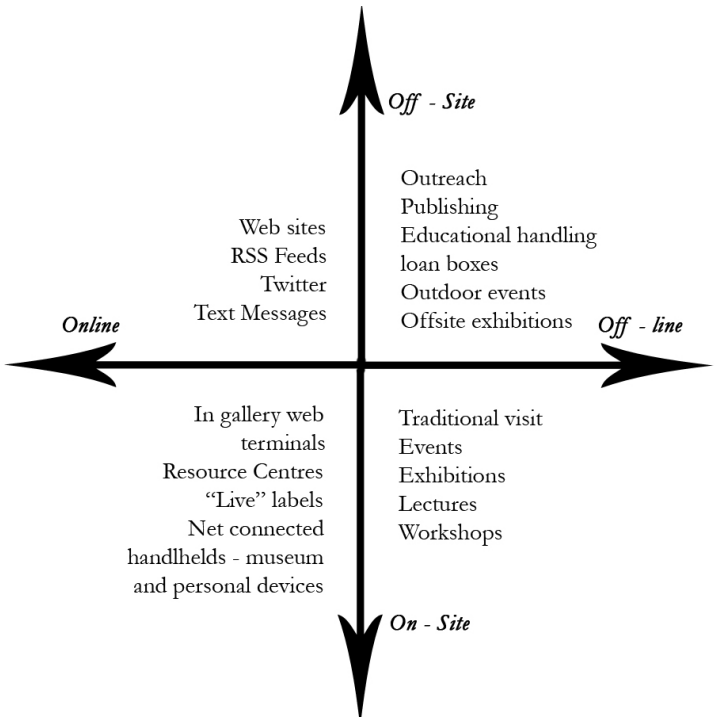



*Figure viii - How technology is used on and offsite by the museum (after Parry)*

The use of technology inside museums sits side by side with the change in museums from "object centred experience" to "the experience centred museum". [27] Though digital technologies' first use in museums was for cataloguing and archiving, it is now shifting museums from objects to experience. [28] This shift, though still placing objects at the centre of what museum are about, now places greater importance on encouraging the visit as inter - active learning experience rather than object – centric display and observation. *Figure viii* looks at how technologies move operate within the museum experience. Their characteristics of use can be roughly defined as offsite, onsite, online and offline. Whether they are used in the museum or at home, connected or unconnected to the internet, determine what kind of experience is possible.

*"…the predominant element in these museums, much more than the object in itself, is the discourse – the logical sequence, the syllogistic chain, the reasoning process which each individual display and the overall script of the exhibition as a whole seek to expound."* [29]

---

27 Hooper – Greenhill (2000)
28 Parry (2007), pg.15
29 Montaner in Parry (2007), pg.81

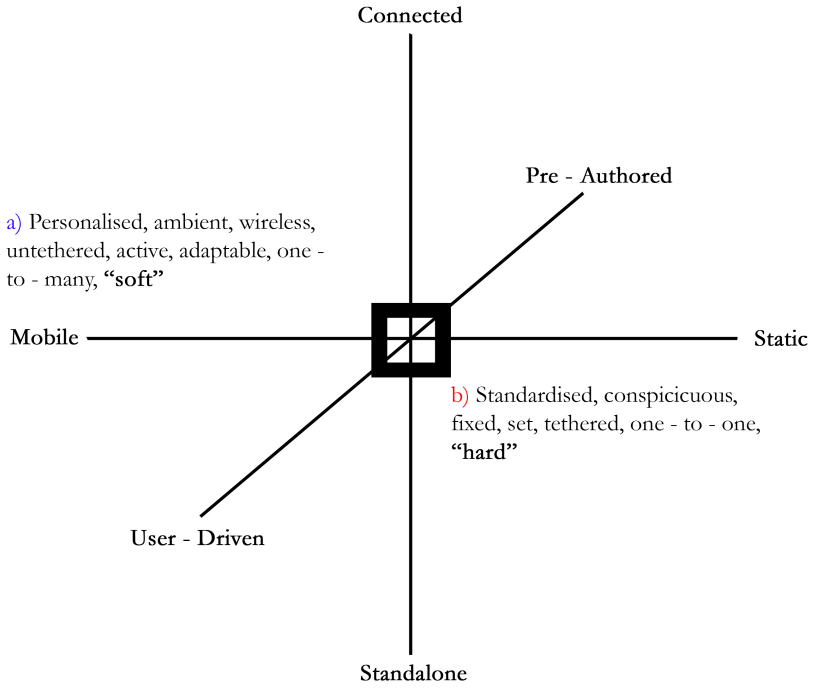



*Figure ix - Mobile and static technologies and opportunities for experience making.*

By providing handheld technology for visitors to the galleries, the museum is augmenting the collections with added layers of interpretation and information. When coupled with web based applications, used on a personal level by individuals in the galleries, a number of issues are raised. What role does the curation of the gallery now become in the midst of user generated content and comment and how does this affect the experience? And more to the point, why would curators and the museums they design for have such a desire to relinquish their traditionally accepted authority and control over the collections?

*Figure ix* looks at how as web technology develops so do the potentials for moulding the manner in which people use the galleries. In galleries, digital technology has tended to be static, say an information booth which allows access to catalogue records. The content on this is authored by the museum and not linked to other networks, such as the web or other museums whose collections may be relevant. Whereas, at the opposite end of the spectrum, there is the potential of mobile technology moving freely around the galleries, such as a smartphones or handheld guides. Connected to the web by 3G or wireless connections, it can be user driven; by choices of route or interest, or even more so by allowing users to connect to each other and comment and affect each others experiences creating a fluidity in notions of the collections.

For the museum and visitor this holds a very active participation in interpretation. The visitor is invited to become part of the meaning making process. The content created, as it has no fixed publication medium, can be edited, re-evaluated and re – authored, in the words of Parry, "forever an unfinished project, open to further amendment or reconstruction." [30] The flexibility and fluidity of these voices from the museum interferes which its traditional roles and visitor expectations of authoritative voice. Where we see this, we see an important glance by the museum at the awareness of the diversity of its audiences and also towards social engagement and the social role of the institution. [31]

Despite these potentials, it is necessary to still be cautious about such claims. The amount of engagement on offer here still depends of the "digital literacy" of the user. To participate in these forms of interpretation and self generating curating models it requires that the user is confident and familiar with such technology. Although the museum is generally considered a neutral and safe space in which to visit, it may still be intimidating to some with this feeling being further amplified by unfamiliarity with the forms of interpretation offered. [32] There may also be a fear that it would lead to a dumbing down of museums, but the two approaches of interpretation are not mutually exclusive.

The use of technology in educational environments has been advocated by many as a way of motivating and engaging teenagers' learning. Mark Prensky coined the term, "Digital Natives", to describe the difference between generations who have grown up surrounded by technology embedded in everyday life. [33] These forms of technology include mobile phones, computer game consoles, digital cameras and the internet. He suggests that the power of these devices in education derive from the familiarity and comfort that a young audience have with them. Di Dawson also advocates their use saying that, mobile devices in familiar are less threatening than desktop computers, due to heir personal size and use. [34] Due to this, "…for young adults, mobile technologies can have a particularly broad appeal and engage them in learning where other methods have failed." [35] This is echoed by a number of other researchers such as Duckworth (2001) and Harris and Kington (2002) who also note that technologies and online learning has a beneficial influence on learning and motivation. A number of reports have

---

[30] Parry (2007), pg. 102
[31] Trant (2009)
[32] Parry (2007), pg.98 and Doyle and Doyle (2010)
[33] Prensky (2001)
[34] Dawson (2007), pg.8
[35] ibid, pg. 2

also noted that technology seems to increase focus on tasks set. There is also a "significant drop" in non – task directed behaviour when technology is involved in classroom sessions. [36] Technology can be a very useful learning resource when used correctly, expanding the possibilities of student control and ownership, while providing a familiar and "of the moment" platform with which to learn.

[36] Van Daal and Reltsma (2000) in BECTA (2003), pg. 2

# Chapter 5

## Research Methodology

The collection of data shall be triangulated by the use of questionnaires, observations and student generated content. The questionnaire has been designed to evaluate some specificities regarding e – learning and m – learning which are not covered by the standard learning evaluation forms used by the museum. The standard evaluation covers areas such as "inspiring a passion for London", which although is a key mission statement for the Museum, is not a key aim of the research questions set.

Due to this reason, the questionnaire developed for the activity looked at issues such as the ease of using technology, the effects of using a handheld device in a situated environment and elements set forth by Laurillard's Conversational Framework, such as student to student communication as mediated by the technology. One key area that the questionnaire was designed to look at was the continuity between gallery contexts and the space in which the learners inhabit as they set tasks and riddles for each other. John Cook defined this as, "learner generated contexts", that is, the learners gain independence from the led activity and the set "rules" and begin to form their own ways of generating learning between each other, peer to peer. [37] In this shared uploading environment where the communication between peers occurs in two contexts, the physical and the digital, social construction of knowledge begins to take place, and it could be argued, agitates the learners into self – motivated acquisition and interpretation of knowledge. [38]

The early questions of the questionnaire were written in order to asses the effect of prior knowledge and use of the technology on the enjoyment and achievement of the learners. Did prior use of the iPhone allow students to gain greater depth in the activity and take full advantage of the possibilities for inter student communication? Did knowing how to use the phone mean that a student was able to answer more questions in the time allotted? These questions are not a key part of the research, but they have been included

[37] Cook, Bradley et al. 2007
[38] Laurillard, 2007, p. 170

as a quick side note in order to pick out any patterns should they be obvious or meaningful in the larger context of this study.

The remainder of the questionnaire looks for other information to fill the gaps that are not measured quantitatively by the prior questions. By leaving the questions open ended, such as "What should we change?" and "What was your favourite thing about the activity?" the questionnaire hopes to gather the feelings of the participants regarding this activity and any particularly difficult to measure points that might be missed by observations. These comments would also go on to further develop the activity for further sessions and also be used to consider how the technology used affects the learning experience.

**Observation Methodology**

Once the classes were in the galleries, I observed the students engaging with the activity galleries and the technology. The observations took a qualitative approach in order to capture variables and analyse them against the theoretical framework surrounding the project and its evaluation. This enabled me to look at trends and patterns within the gallery which would otherwise have been missing from my data had it only used questionnaires and the final m-learning product, e.g. the web pages and subsequent interpretation activity. The flexibility of this approach allowed me to recognise and further investigate areas that would have been too pre-defined in quantitive research questions in the observation, for example, how many students are at one case and how long it takes a student to find an answer after locating the QR code.

However, a fully qualitative approach is not taken. The first questions on the observation sheet look at measuring a number of quantifiable features. By measuring how many students are solving one particular clue, it is possible to investigate a number of elements. A large number of students solving one clue could indicate a number of things. Firstly it could indicate that one specific riddle is easier than the others. Second is the fact that it may indicate that students are following each other rather than the clues set for them by spotting who goes where an therefore leading them to the clue. By marrying the two

approaches both sets of data will work to augment each other and treat each other as valid and equal within the research. [39]

The method taken towards observations was planned to be systematic in order to reduce bias in the observations and also enable a view of the bigger picture, the whole of the gallery environment and the students interacting within it.

The following systematic method was planned to be applied:

Each time a specific event can be recorded, the observation sheet will be completed in order of the questions on the sheet. This means that there were waiting periods between answering questions, say if there was no group at a clue or no group to group interaction happening. When it did happen it was recorded and the next question was moved on to. The location in the gallery moved from left to right with the completion of each sheet at the locations marked on the map. This was hoped to encourage a multiplicity of views within the gallery and ensure that I did not stand in the same position throughout the activity. [40] As the activity is split over two galleries, half the time was spent in each for every group.

There are downsides to this approach. There is no measure of if a certain action is likely to occur at a given time, for example in the sequence of visitor interaction or if certain behaviours will happen at any one point allowing the evaluator to compare groups of behaviours against others. The setting of a certain time schedule such as taking an observation every 20 seconds is quite demanding on the observer and the approach taken here allows for more paced and contemplative data to be recorded.

The questions in the observation are designed to focus on parts of the framework that create opportunities to look for the pre – supposed unique selling points of mobile learning. By looking at how the teacher is involved it will reveal if the learning experience is self – motivated, lead and experienced. Similarly, the interaction between groups was studied to look at how both face to face interactions occur as well as communications which are digitally mediated. These points enabled the analysis of the data to focus against the Conversational Framework which is its starting point.

---

[39] Marshall in Orna – Ornstein (ed.) (2001), pg. 14
[40] ibid pg. 2

**Weaknesses in the evaluative and data gathering methods employed in practice**

Upon the completion of the data gathering a couple of weaknesses became apparent in the design and execution of the work done on the day. Firstly, when analysing the data, the final question on the questionnaire, "What, if anything, did the iPhone allow you to do that you couldn't have done without it?", shows flaws in its design. The question was far too narrowly focussed and the responses reflected this. The majority of the answers received revolved around technical issues rather than ones of learning. Sample responses included, *"Scanning the codes"* and *"Accessing the internet"*. These are self apparent and add nothing to the understanding of the learning taking place, though some answers hinted at some of the unique characteristics m – learning such as setting tasks for other students and having digital and physical representations of objects available simultaneously.

*"It showed me pictures of more things"*

*"I could use the internet to review objects"*

Secondly, the observation method, though planned to be systematic was a very different matter upon entering the galleries. As I was involved in setting up the task and directing students to the relevant galleries it meant that I effectively took on the role of teacher for the students. This was exasperated by the roles of the teachers themselves in the activity, all of whom bar one, took a back seat approach and allowed the students to work independently. Though this one of the observation questions, what was their role in a largely self directed and self generated context, in practice in meant that students came to me with questions and for conservations. Though this increased my understanding of the types of learning actually taking place it meant that the systematic approach had to be rejected with something much more fluid and adaptable to the situation. I continued to change positions in the galleries, but these were largely dictated by where the students were working and who needed assistance.

# Chapter 6

## Analysis

In order to analyse the outcomes of the gallery activity, the data from observations, student questionnaires and the blog comments are combined. To gain a full understanding of how the activity operated, that is how the students interacted with each other, the galleries and the topic, all data will be mapped against each other. This will involve looking for patterns of behaviour, signs of peer to peer communication and the manner of interpretation which the activity elicited in the gallery. A total of 49 questionnaires were collected from a total of 61 students and the web pages provide a rich array of material. In total they were accessed by the groups 368 times, leaving 177 comments during the activity.

### Peer to Peer Communication

During the activity the students were working in pairs or groups of three. This meant that there were two types of peer to peer communication occurring: within the groups themselves and between separate groups. The communication between groups either occurred as they spoke to each other as they moved around the galleries or was mediated by the iPhone as they left messages for each other on the web pages. Using observation and data from the blog it is possible to explore what role the communications played in forming their experience and also how the use of technology created an active virtual forum for discussing the galleries and themes of the study day.

The observation data collected shows that groups working in pairs were keen to show each other how to use the technology in the session. The questionnaire found that from 49 collected responses, 10 students had never used an iPhone before. This meant that there was ample help at hand should students feel unsure of how to operate the hardware and software used during the session. Though instructions on how to use the software appeared on the back of the riddle sheet handed to students, they more often then not preferred to ask myself or each other for help.

*Figure x – "EnTWINed" by the Singh Twins, gouache and gold dust on card, 2009.*

Dialogue between students working in pairs showed a high level of engagement in the task. Students were pointing out details to each other in objects and in the design of the galleries themselves. Whilst looking at "*EnTWINed*" by the Singh Twins, students appeared to really engage with a modern interpretive piece placed within a gallery of Seventeenth and Eighteenth Century objects (*Figure x*).

The work is a commissioned response to two paintings in the gallery by Henry Nelson O'Neil, *"Eastward Ho!"* and *"Home Again"*, 1857 and 1858 respectively. O'Neil's paintings were blockbusters of their day, with their exhibition drawing large queues of visitors. They depict soldiers of the British Army leaving and returning from fighting in the First Indian War of Independence, powerfully conveying the sense of pride and loss as they leave for India and the relief and return, albeit, injured, scarred and worn. The Singh Twins draw on the tradition of Indian miniature paintings, with its detailed and formal designs and look at the impact of diaspora on British identity and Indian identity. This

piece also draws parallels between the contemporary "War on Terror", as coined by George Bush and British propaganda during the India's first war for independence, pulling quotations from both and weaving them between images of ephemeral pop culture, celebrities, historical figures and freedom fighters and Bollywood posters. There are many readings and layers of meaning in this piece, so it is no surprise that when asked the question, "What message or story is this picture communicating to you?", discussions took place. The interpretations from the students and the communication that took place are a display of the multiplicity of meanings in the paintings:

*"All the Indian trade came into Britain - that's not true, well so what do you think it is?"*

*"Ok, well it explains the interlinked countries"*

In the blog entries, a number of different answers were given. This is showing that despite being able to see each others answers on the web page students were taking the painting and interpreting it in a number of ways:

*"That we are all a family."*

*"It shows the positive side of Britain and how diverse it is."*

*"To explore interlinked histories of India and Britain"*

*"The Indian culture has influenced Britain in many different ways."*

*"That the Indians and the British began to mix and both cultures mixed."*

*"That even back then they had talent shows."*

The answers acknowledge that the resonances of the Empire are felt through contemporary culture and present day cultural make-up. Though there is a sentimental answer and a confusion about the modern elements mingled with the traditional painting style and context, these responses do show an engagement with the piece.

The activity stimulated debate amongst pairs about the ideas of empires and reflected on the impact on their lives today. In the galleries, one pair talked about how empires had existed through out history, asking, "Where was the first empire?", "What was the biggest empire?" and "Did Sudan have an empire?" As the students who asked this were of Sudanese heritage, this idea that empires come and go was of interest to them and left them wondering if somewhere in their heritage, Sudan had been a ruler of an empire. As the question had them debating, they came over to ask a gallery host those same questions. The host explained the history between Egypt and Sudan, as well Sudan's part in the British Empire. The link created between gallery and personal history and interestingly the fact they were subsequently engaged enough in the discussion to ask a member of museum staff for further information, demonstrates a high level of engagement with the subject, but also that technology in the galleries is not all consuming, and particularly for young users, it augments the experience of the space as a whole.

Students could also communicate with their peers by setting riddles for each other to solve or replying to each others comments on the blog pages. In order to create "user generated contexts" as put forward by Cook, the activity tried to encourage a multiplicity in the ways that students communicated with each other. By increasing the avenues for communication in was hoped that students would begin, inadvertently and consciously, direct the experience of others around them.

The option to set riddles for each other was enabled by a QR code on their riddle sheet which when scanned lead them to a page where they could write and answer self set ones (*Figure xi*). Example riddles set by students include:

*I pull carts but I'm not a car.*

*I'm yellow in and out.*

*I came in from Egypt, green and on a ship.*

*I'm under your feet but I don't maow (sic) when you stand on me.*

Though there were not many riddles set by the students, the majority of the ones asked got answered and commented on. The answers on the page show that the use of blog pages and comment boards gave the students confidence to use familiar internet


*Figure xi - Riddles set by students for others in their group.*

slang that would otherwise not been allowed or seen as acceptable. "LOLZ", meaning to "Laugh Out Loud" appeared twice on the page. These familiar internet communication forms also appear on another page. *Figure xii* shows an answer page to a question

in the Roman gallery where two students answered and gave their tag names as "Yum Yum" and "Smiley". Their peers replied with, "Lool ("LOL" sic), ur real names please". This points to some confusion of subject, medium and context. The use of shortened word forms, screen nicknames and slang all points to a familiarity of using electronic communication such as instant messaging and comment boards. Yet students are policing each other in their use of real names, but not their own use of language, with the medium supposedly justifying its use rather than conforming to standards of language inside school work.


*Figure xii - "Real names please"*

In seeing how the self set riddles affected the students' own navigation of the galleries and activity, the questionnaire set to measure students' opinions **(Table 2)**. Question 7 asked, "My classmates set where I went in the gallery with their riddles". The results were split evenly over negative and positive over the responses, with 24 people answering scoring 1 or 2 and 23 people answering 3 or 4. Coupled with the low response rate in setting riddles for each other, it is possible to conclude that the activity did not manage to establish an environment in which all students could set their own learning contexts. Nevertheless, there is promise in the ones which were done and the activity perhaps needs polishing to make it effective as an optional part of the activity to be used if students should want to.

**Table 1: Questionnaire question 7**

| **Score** *( 1 – Do not agree and 4- Agree Strongly )* | **1** | **2** | **3** | **4** |
|---|---|---|---|---|
| My classmates set where I went in the gallery with their riddles. | 8* | 16 | 13 | 10 |

* Represents raw score n = 47

**Interaction with objects**

One criticism often levelled at using technology in museums is that it can distract the user from the collections, the key learning resources. One research question in this project is to establish how technology affects visitors' relationship with the artefacts on display. Though the activity is acted out in a handheld device, that itself is situated in a physical gallery context. Thorough investigations with the objects are needed to complete the activity successfully and the handheld's purpose is to direct that looking and draw interpretations from what is seen.

During the observation in the galleries there were a number of instances which suggested that the activity was focussing students' attention on the key objects. Students at *"enTWINed"* by the Singh Twins pointed out details to each other in the image:

*"I'm liking this picture - look at the background."*

The students then went on to talk about tall the different details in the background and recognised a number of the pop culture references which began a conversation about dancing and the different acts on talent shows.

One particularly powerful exhibit was the array of spices and traded products which students can smell, situated next to an interactive map of trading routes. Here students can smell tea, coal, cloves, cinnamon and other goods which came from the British Empire.

*"Try and smell this one - smells like barbeque"*

*"Ergh! Tobacco, oh my day!, Smells alright though."* (Teacher then expands on why and where it comes from)

*"Tobacco smells the best of all of them!*

*"That's the smell of Grandma's"*

Students were found a number of times to be directing each other to this exhibit and then encouraging each other to smell the items. It proved a useful conversation starter for the teachers as well. On smelling the tobacco one student was amazed that it smelt so nice. The teacher expanded on why this was and explained about where it arrived from and how it was smoked in the period. Another teacher talked about cooking and dished which used the spices. The mix of sensory material in the galleries and there was deliberate routing of students to exhibits which involved touch, listening, smell and kinetic activity.

The questionnaire had elements which looked to find students own opinions of their experiences with the objects. Question 5 asked "I think the activity made me think of objects more closely", and Question 10, "The iPhone has made it easier to remember which objects are in the galleries." There were responses to each question rating their agreement on a scale of one to four. The null hypothesis from the outcome of this questioning is that the activity and use of iPhone technology had no impact of on the interactions and impact of looking at objects in the galleries.

A Pearson's Chi Squared test ($\chi^2$ test) gave a chi square value ($\chi^2$) of 30.122, degrees of freedom value (df) of 16 and a probability (p – value) of 0.017. Against a critical chi square value of 30.4 this indicates a significant statistical difference between the scores, with those thinking they looked at objects more closely being agreement that the iPhone made it easier to remember more them. It is therefore possible to reject the null hypothesis.

This points to the idea that handheld technology can be used as a stimulus for engaging people with gallery artefacts. The active nature of the experience, with students being directed to look closely, means that they make a greater impression. However, this also points to a correlation in students who scored these questions lowly. This may indicate that the approach was unsuccessful for some. Looking at the questionnaire data, one student who scored both these questions with a one said, "Using an iPhone – map = better". It is clear that the use of technology will not be suitable for all but the weighting of the results do still sit on the positive side.

**Table 2: Looking and Remembering**

| Item | 1 | 2 | 3 | 4 | NA |
|---|---|---|---|---|---|
| Q5) I think the activity made me think of objects more closely. | **1*** | **5** | **21** | **20** | **1** |
| Q10) The iPhone has made it easier to remember which objects are in the galleries. | **6** | **6** | **10** | **24** | **2** |

*represents raw scores n = 49

**Motivation and Engagement**

The use of mobile technologies in learning has been advocated as a useful motivational tool in engaging and empowering teenagers with their own learning. Their positive attitudes to technology can be harnessed to enhance their attitude to other learning. [41] The activity with the iPhones created a lot of excitement amongst the students who were keen to be using the devices along with a technology that they had not seen before, the QR codes.

In the post activity questionnaire, 30 of the 49 respondents said that the iPhone was the favourite thing about the activity whilst another 6 said the QR codes were their favourite part, a key feature and motivator. For others the more traditional aspect of the activity was flagged as most important. Objects and interactions with the physical space were noted as being the most important, as was talking to the gallery hosts. This remainder of the responses included a number of different choices:

*"Interacting with the galleries."*

*"The riddle solving and the smells in the British half."*

[41] Dawson (2007), pg.9

*"That we had to act like detectives."*

*"I think it was all about the buildings."*

*"I learnt a lot from the pink people."* (The hosts in the galleries.)

*"It let us explore the galleries."*

*"You get to solve questions which involve you to read the info more carefully."*

At the start when students were given the iPhones, they were given a quick demonstration in their use. Data was collected on the number of students who had used one before: from 49 responses, 10 had not (20%), whilst 38 had (78%), with 1 not answering (2%). People who had used them before were keen to show others were had not, encouraging immediate dialogue within the group. This was also observed again inside the galleries during the activities, with students assisting each other in using the phone.

Another motivating factor during the activity was the element of competition. Students were very keen to be the group who found the most clues and solved the riddles before the others. Students jokingly blocked cases to stop others getting to the QR codes, told each other riddles which set groups in the wrong directions and boasted over how many clues they had found. Though this wasn't necessarily designed into the activity, it did provide an added layer of motivation to do better than their peers.

In relation to "user generated contexts" and the personalisation of the experience creating motivation and engagement, there is some evidence in the questionnaire feedback that this is the case:

*"It allowed me to write my opinion about it (that) everybody could read."*

The empowerment of sharing your own interpretations of the objects, in real time as mediated through the technology is something which Laurillard picks up on in the Conversational Framework. It is through this communication that interpretations can be

discussed, reformed and then posted to the blog answer page. The ease at which students used the devices, as apparent through the use of net language and screen nicknames, created a context of formality in which they could comfortably use social language.

Although students worked in pairs in the gallery activity, this does not mean that they were isolated from the rest of the group. A particular criticism could be levelled against using technology in galleries with children because of potentially creating self absorbed spheres around the handheld devices. As learning is a social process where ideas are reformed and re-evaluated in the light of action and feedback from others, this social element was a key part to the design of the activity. Communication between groups occurred in two mediums in the galleries: spoken and written. Spoken communication happened as students explored the spaces and objects, advising and chatting with other groups along the way.

**Recommendations for future improvements**

In order to improve the activity in the future, the questionnaire collected information on the parts of the activity which the students felt could be improved. A number of responses pointed to the riddles, noting that they were difficult to solve. The solution to this is to create two versions of the riddle sheet for differing ability levels. The teacher would then be able to select the one which is most suitable for the class.

There were two responses received on the feedback forms which mentioned freedom of movement inside the museum's galleries:

*We were restricted to do things. For example, if I was interested in the Black Death video but I was not allowed to watch it.*

*We should have more time and a map and be allowed all over the gallery.*

These points rise out of a conflict with the apparent freedom given by the activity, which is self lead, directed and contextualised, and the constraints imposed by the museum and teachers who have to keep the students on task as well as in the same area of the galleries in order to keep note of everyone. Solutions to this problem are not easy to come across. Due to time constraints across the whole day where there area number of groups with a

number of different sessions happening it is often difficult to fit independent gallery visit time into the visits. The activity gives opportunity to do this in a focussed manner, however perhaps it is necessary to extend the study day's length to include it, or give the choice to teachers to incorporate it into their visits at some point.

As the groups who partake in the activity have the opportunity to revisit the work done in the galleries back at school by looking over their answers on the web page, it would be worthwhile to see what kind of discussions arise from this. The pages are a rich vein of opinion and debate but research into this would require a significant investment of time which is unfortunately unavailable for this report. Key research questions from this could be to look at if students' impressions change post visit after a period of "settling in" and also how the materials are used by the teacher in the classroom and if it again becomes an interactive experience through the use of its presentation on interactive whiteboards. Further use of interpretive questions in the activity would also increase the potential for this.

# Chapter 7

## Conclusion

This report set out to investigate in which ways mobile technologies used in gallery activities mediated students' engagement with artefacts and their peer to peer communication during the activity and also how the use of technology affected student motivation. Through analysis of observations, feedback questionnaires and the digital products themselves it is possible to put forward a number of proposals.

Through observations and feedback forms it is possible to see that students were deeply engaged in the task and were prompted to look closely at artefacts in the galleries. The questions delivered to their handheld devices focussed their investigations and required careful analysis of both objects and information labels. The feedback forms threw up two descriptions which describe the activity quite well; "treasure hunt" and "detective work". These both suggest an active learning process in which students must rely on their own skills in order to do the activity. Finding the codes required students to understand how the gallery was thematically organised and then focus in on individual exhibits. The technology in this context acted as enabler, a key to open up further layers of the activity, and as record, a dynamic and changing environment in which the group collaborates and discusses.

Although there was not a significant use of students setting riddles for each other in the galleries, there was still evidence of user generated contexts. When students answered each others riddles they did so in a style which mimicked internet social networking in which humour and internet slang was widely used. This can be seen as students taking ownership of virtual space where they are in control, where they take ownership of the digital product produced and where the rest of their peers are involved. It is interesting that there was evidence of students telling each to use their real names instead of their screen names, or net names, as some must have realised the conflict between what is normally a social space being combined with a formal educational one.

Yet the use of technology was not a barrier between groups in the galleries and not all communication was done purely through the iPhones. There was a lot of talk between groups and competition to find and answer as many clues as possible. Students were keen to assist their peers with the technology and the session really drove itself with little interference from the teachers.

There was substantial evidence for students being highly motivated by the use of technology. From the beginning of the task students were excited about using the iPhones and continued to be focussed throughout. The majority of students cited the iPhone as the favourite part of the activity whilst others coupled with this being able to explore the galleries, showing that the two are not mutually exclusive. In total the web pages were accessed 368 times with 177 comments left by 30 individual groups. This means that students accessed on average 12 pages each and left comments on 6 of them. Over the course of 40 minutes in the galleries this is a considerable amount of work. Students required very little supervision and were keen to direct their own learning and work together, and occasionally with the gallery hosts, to explore the galleries and the theme at hand.

There are a number of improvements that can be made to both the activity and the research as outlined in the previous section, along with challenges such as providing an accessible provision which still allows for the use of technology. However, the potentials for creating debate, discussion and high levels of motivation through the use of handheld technologies in museums are enormous and could see a change in the way that museums consider their contextualised learning during school visits and after.

# Glossary

### 3G

International Mobile Telecommunications-2000 (IMT--2000), better known as 3G or 3rd Generation, is a generation of standards for mobile phones and mobile telecommunications. Application services include wide-area wireless voice telephone, mobile Internet access, video calls and mobile TV, all in a mobile environment. It provides data speeds of at least 200 kbit/s in a suitable networked environment. It has now been superseded by 4G, which provides faster mobile data speeds.

### Apple iPhone

The iPhone is a range of smartphones first released by Apple Inc in 2007.
An iPhone functions as a camera phone, including text messaging and visual voicemail, a portable media player, and an Internet client, with e-mail, web browsing, and wi-fi connectivity. The user interface is built around the device's multi-touch screen, including a virtual keyboard rather than a physical one. Third-party applications are available from the App Store, which launched in mid-2008 allowing users to download software.
The iPhones used in the activity were the "3G" models.

### Apps

Apps are third party applications, that is, not developed by Apple Inc. These pieces of software are downloaded onto the iPhone via iTunes and extend the functionality of the device.

### Augmented Reality

Augmented reality is a term to describe the use of digital imagery being superimposed upon, or augmenting, the physical world as mediated by a digital device, enhancing the amount of information available to the viewer or user in real-time.

**Blog**

Blog is short for "web log" and is a type of website or web page. It generally allows any writer to create their own log or diary which they control and add content too. Blogs can be followed by visitors who can comment on entries to the page.

**E – Learning**

The use of digital technologies to enhance and augment the learning experience. It has a particular focus on using the characteristics of technology, such as personalisation, collaboration and use of multimedia.

**GPS**

Global Positioning Systems (GPS) is a navigation system originally developed by the U.S. Department of Defence. Using satellites, GPS triangulates the users signal position to give tehm a reliable and accurate location.

**M – Learning**

Mobile Learning (M – Learning) is closely related to e- learning except that it allows for untethered use of digital technologies in learning, such as PDAs, smartphones and mobile phones.

**Online**

The state of being connected to a network, such as an institutions intranet or "in house" network or the internet, a global network. Offline refers to the state of not being connected to a network.

**QR Code**

QR Codes (Quick Response Code) are matrix barcodes which though originally developed for tagging in manufacturing, have now extending into the public realm,

appearing on film posters, buses and products. They can be read with scanners, mobile phones with cameras or smartphones. The data held within the code can be text, a web address or other data.

**Short URL**

Short URL is an Internet technique which takes a standard URL (the address you type into a browser) and creates a shorter and easier to remember one. This can be done using online applications and is done for aesthetic reasons, creating data hierarchies and simplifying QR Code matrixes.

**Smartphones**

Smartphones are mobile phones which offer increased computing power for users and developers. They have their own operating systems in which software developers can create multimedia and personalised environments which take advantage of more powerful processors and larger memories,

**User / Username**

A user is someone that uses a computer or internet service. They may have to log in to use the service and be identified by a username or screen name. In internet contexts this can sometimes be a pseudonym which is used for social networking or blogging.

# Appendix

Appendix i – Sample student evaluation form

Appendix ii – Completed evaluation form

Appendix iii – Observation form

Appendix iv – Completed observation form

Appendix v – Sheet of riddles used in the activity by students

Appendix vi – Teachers' answer and help sheet

Appendix vii – Sample web page showing answers

Appendix viii – Sample post visit web page showing lists of questions and images

Appendix ix – Questionnaire Data

*Appendix i*

# Impact of Empire
# Pilot Evaluation

Male ☐ Female ☐

Have you ever used an iPhone before?

Yes ☐ No ☐ No, but I have a similar phone ☐

On a scale of 1 to 4, how much so you agree with the following statements?

1 – Do not agree & 4 –Strongly Agree

| | **1** | **2** | **3** | **4** |
|---|---|---|---|---|
| Using an iPhone was an enjoyable part of the session | | | | |
| I needed assistance from a teacher or the museum staff<br>If agree, why did you need help? | | | | |
| I think the activity made me look at the objects more closely | | | | |
| It was easy to set riddles for other classmates on the iPhone | | | | |
| My classmates set where I went in the gallery with their riddles | | | | |
| We had to work together to answer the questions | | | | |
| The activity helped me choose the object that most represents empires for me | | | | |
| The iPhone has made it easier to remember which objects are in the galleries | | | | |

How many riddles did you solve in the gallery?

0 – 3 4 – 7 8 or more

What was your favourite thing about the activity?

What was your least favourite thing about the activity? What should we change?

What, if anything, did the iPhone allow you to do that you couldn't have done without it?

***Appendix ii***

# Impact of Empire Pilot Evaluation


Male ☐ Female ☑

Have you ever used an iPhone before?

Yes ☑ No ☐ No, but I have a similar phone ☐

On a scale of 1 to 5, how much so you agree with the following statements?

**1** – Do not agree & **5** –Strongly Agree

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Using an iPhone was an enjoyable part of the session | | | | ✓ |
| I needed assistance from a teacher or the museum staff<br>If agree, why did you need help? | ✓ | | | |
| I think the activity made me look at the objects more closely | | | ✓ | |
| It was easy to set riddles for other classmates on the iPhone | | | ✓ | |
| My classmate set where I went in the gallery with their riddles | | ✓ | | |
| We had to work together to answer the questions | | | | ✓ |
| The activity helped me choose the object that most represents empires for me | | | | ✓ |
| The iPhone has made it easier to remember which objects are in the galleries | | | ✓ | |

How many riddles did you solve in the gallery?

0 – 3 (4 – 7) 8 or more

What was your favourite thing about the activity?

I got to use the iphones as I walked around

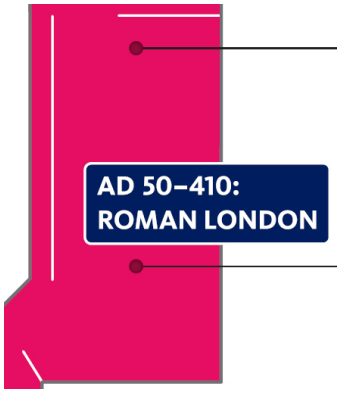
What was your least favourite thing about the activity? What should we change?

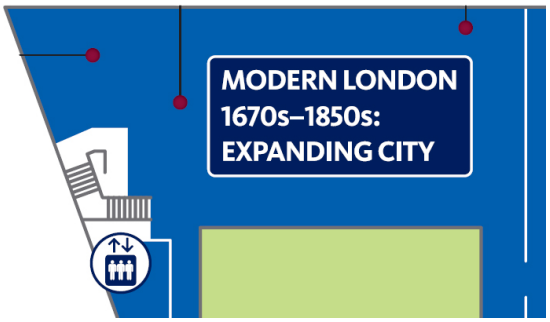
the barcodes were sometimes hard to find and were quite small

What, if anything, did the iPhone allow you to do that you couldn't have done without it?

It allowed me to write my opinion about everybody could read.

*Appendix iii*




# Impact of Empire
# Observation Sheet

**Group number** 1 2 3

**Time**

**Groups at clues**

**Most groups using one case / clue**

**Teacher Actions and Involvement**

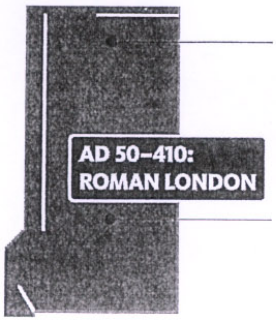
**Peer to Peer Dialogue**

**Group to Group Dialogue**

**Group interaction with objects**

***Appendix iv***

13





## Impact of Empire
## Observation Sheet

Group number 1 2 (3)

Time 13.02

Groups at clues 4

Most groups using one case / clue 4

Teacher Actions and Involvement

V. involved expanding on ans. explaining. Teacher pulling ss.

Peer to Peer Dialogue

You said opium but its not, both its the shoes (re: left one)

Group to Group Dialogue

Both Dunn, here. – There's no other side (its scary in here, don't like the noises.

Group interaction with objects

Using whistles – Using handheld objects in cases

***Appendix v***

# Impact of Empire

Solve the riddles to find the objects in the galleries that will unlock the story of the British Empire.

Each riddle leads you to a case in the galleries. Once you find the case look for a QR barcode like this hidden somewhere on the case or in the area and then scan it with the iPhone. This will take you to question which you can answer.

If you have time, scan the code above and set a riddle for your classmates to solve. You can see and answer other's riddles by scanning it too! Remember to work to together to solve the trail…

Where you come to get your thrill, to watch the gladiator fight and kill

Perfume bottles and panes – this material was first introduced to London by the Romans bringing new skills and trade

From Government officials to labourers, Latin was the word on the street

There were baths and doctors all around, this made London a healthy town

Pots from France and olive oil from Spain, all these goods from Roman gains, marble from Greece and Turkey too, here some emeralds they brought for you!

In my temple you will find all the gods who lost their heads!

Turn the handles and watch the empire grow

Touch this screen and you can see, how the lives of the poor used to be

London City of fortunes lost and won, this was home once all your money had gone!

A picture paints a thousand words and this bright one was made by two entwined

From the empire came beautiful things, silk dresses and fans and diamond rings

Group 3

*Appendix vi*

**Impact of Empire iPhone Trail**

**Teachers Sheet**

# Roman Gallery

Where you come to get your thrill, to watch the gladiator fight and kill

**Amphitheatre Case- Leather bikinis**

Perfume bottles and panes – this material was first introduced to London by the Romans bringing new skills and trade

**Glass Makers Case – Glass**

They were baths and doctors all around, this made London a healthy town
**Health and Hygene Case – Wooden hair comb**

From Government officials to labourers, Latin was the word on the street

**Latin Case – Austelis was wandering off on his own**

Pots from France and olive oil from Spain, all these goods from Roman gains, marble from Greece and Turkey too, here some emeralds they brought for you!

**Foreign Goods Case – Ankle Shackles**

In my temple you will find all the gods who lost their heads!

**Temple of Mithras – Syria**

# Expanding City

Turn the handles and watch the empire grow

**Empire Map Interactive – Make a cup of tea**

London City of fortunes lost and won, this was home once all your money had gone!

**Wellclose Prison – People in debt**

If you touch me then you can see, how the lives of the poor used to be.
**Life Chances Interactive – The local parish**

A picture paints a thousand words and this bright one was made by two entwined

**Entwined by the Singh Twins – Interpretative answer**

From the empire came beautiful things, silk dresses and fans and diamond rings

**Empire Case (Far Right) – Silk dress as it was illegal to import silk**

***Appendix vii***

## *Expanding City – Clue 2*

**What sort of people got sent to Wellclose prison?**

PUBLISHED IN: UNCATEGORIZED ON JUNE 16, 2010 AT 3:30 PM COMMENTS (5) EDIT THIS

Like Be the first to like this post.

RSS feed for comments on this post.

### 5 Comments Leave a comment

On July 7, 2010 at 10:31 am [redacted] said: |Edit This

People who desobayed th king

Reply

On July 7, 2010 at 10:33 am [redacted] said: |Edit This

Thieves

Reply

On July 7, 2010 at 10:34 am [redacted] said: |Edit This

Insolvent debtors

Reply

On July 7, 2010 at 11:10 am [redacted] said: |Edit This

Insolvent debtors

Reply

On July 7, 2010 at 11:26 am [redacted] said: |Edit This

Insolvent debtors

Reply

JUNE 2010

| M | T | W | T | F | S | S |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | | | | |

Search

Categories:

Uncategorized

Archives:

June 2010

BLOGROLL

Documentation

Plugins

Suggest Ideas

Support Forum

Themes

WordPress Blog

WordPress Planet

**Appendix viii**

IMPACT OF EMPIRE 1

JUST ANOTHER WORDPRESS.COM SITE

### *Can you riddle your classmates?*

**Pick a case and an object in it and see if others can solve your cunning riddle!**

**In the comments box below, write a riddle for your classmates. Your riddle should lead them to a case and then your question should be about an object you find interesting.**

**You can see your friends' riddles and try to answer them by clicking, "View Comments" and then posting an answer as before.**

PUBLISHED IN: UNCATEGORIZED ON JUNE 16, 2010 AT 4:07 PM COMMENTS (6) EDIT THIS

### *Expanding City – Clue 5*

**What message or story is the picture communicating to you?**

PUBLISHED IN: UNCATEGORIZED ON JUNE 16, 2010 AT 3:58 PM COMMENTS (13) EDIT THIS

### *Expanding City – Clue 4*

**Which item in this case would have been illegal in 1701 and why?**

PUBLISHED IN: UNCATEGORIZED ON JUNE 16, 2010 AT 3:56 PM COMMENTS (14) EDIT THIS

### *Expanding City – Clue 3*

**While the city became richer, who looked after the poor?**

**Have a look on the interactive in front of you and see if you can find the answer.**

**Hint: Look for a begging boy…**

PUBLISHED IN: UNCATEGORIZED ON JUNE 16, 2010 AT 3:32 PM COMMENTS (3) EDIT THIS


Categories:

Uncategorized

Archives:

June 2010

BLOGROLL

Documentation

Plugins

Suggest Ideas

Support Forum

Themes

WordPress Blog

WordPress Planet

***Appendix ix***

# Questionnaire Data

*This is the collation of data from 49 questionnaires given to students at the end of the activity. Numbers in brackets represent raw scores.*

**1**) Male or Female

Male (23)
Female (24)
No answer (2)

**2**) Have you ever used an iPhone before?

Yes (30)
No (19)

On a scale of 1 to 4, how much so you agree with the following statements?

**1** – Do not agree & **4** –Strongly Agree

| | **1** | **2** | **3** | **4** | **N/A** |
|---|---|---|---|---|---|
| **3**) Using the iPhone was an enjoyable part of the session | 1* | 3 | 7 | 38 | 0 |
| **4**) I needed assistance from a teacher or the museum staff If agree, why did you need help? | 23 | 8 | 9 | 6 | 3 |
| **5**) I think the activity made me look at the objects more closely | 1 | 5 | 21 | 20 | 1 |
| **6**) It was easy to set riddles for other classmates on the iPhone | 8 | 14 | 9 | 17 | 1 |
| **7**) My classmates set where I went in the gallery with their riddles | 8 | 16 | 13 | 12 | 0 |
| **8**) We had to work together to answer the questions | 1 | 6 | 12 | 30 | 0 |
| **9**) The activity helped me choose the object that most represents empires for me | 5 | 11 | 19 | 12 | 2 |
| **10**) Using technology made the experience unique | 6 | 6 | 10 | 24 | 2 |

* Raw number n = 49

**12**) What was your favourite thing about the activity?

Interacting with the galleries
Interacting with objects
Looking for barcodes
Yes, using the iPhone
Scanning the barcodes and exploring the museum
Using the iPhone
The iPhones
Trying to look for the barcodes while exploring the museum
It was fun with the iPhone
We got to use the iPhone
Using the iPhone
Using the iPhone
The riddle solving and the smells in the British half
The iPhones
You get to solve questions which involves you to read the info more carefully
Using the iPhone
Using the iPhone
iPhone
Finding the barcodes
Using the iPhone
The iPhones
Scanning the barcodes to get the questions and comments
Using an iPhone
That we had to act like detectives
Going on the treasure hunt
The iPhones
iPhone
Using the iPhone
Using the iPhone
Using the iPhone
We got to use the iPhone
Using the iPhone to answer the questions
iPhone
The iPhones
It let us explore the galleries
I think it was all about the buildings
I got to use the iPhones as I walked around
That we got to use iPhones
I learnt a lot from the pink people (hosts in the galleries)
The iPhone and the touchscreen activities and the items used by empires that you can smell and its challenging
The iPhone and touchscreen activities
We had electronic
Using the application to publish
We used the iPhone to take pictures
Using iPhone
The iPhones

**13**) What was your least favourite thing about the activity? What should we change?

We were restricted to do things. For example, if I was interested in the Black Death video but I was not allowed to watch it
Using an iPhone - map=better
Make it a bit longer
Looking for answers
There were not enough QR codes around
Nothing
Scanning the codes
Less barcodes to find
Not enough codes
To make the codes a little easier to find
Locating the codes
We should have more time and a map and be allowed all over the gallery
Riddles were very hard
Nothing
Using the iPhones
Finding the codes
Nothing because I think it was a good way of learning
Nothing really
Nothing
Some things were hard to solve
Nothing
Nothing
Touch screen activities
Giving them back
Nothing its all good
Looking for answers
Touch screen
The smelling interval
Nothing
It think its all good. And you have to so the TV everywhere. And people explained it.
The barcodes were sometimes hard to find and were quite small
Nothing
Riddles. No riddles just questions. Riddles are hard to solve
Nothing
Nothing
More exciting / interesting background
Makes barcodes bigger to find
Much easier questions
The riddles, using iPhone (camera)
Nothing

**14**) What, if anything, did the iPhone allow you to do that you couldn't have done without it?

I could use the internet to review objects
None
Go on the internet by scanning barcode
Scan the barcode and bring the question
Read the QR codes
Yes
Nothing except read the barcodes
Scan the codes
Scan a code and code and get a link to a webpage
Read the QR code
Yes because otherwise I couldn't find out the questions
Scan the QR codes
Scan the codes
Read the QR codes
Scan the barcodes
Scan the questions
well I will use the iPhone
Take pictures and connect to the internet
Take pictures
Maybe it would take more time
No
Yes it made it sufficient and fun
Take photos
Go answer questions differently
It showed me pictures of more things
Yes it did, looking for other peoples comments
Read the code
Look at pictures more closely
Type! ;)
Nothing I enjoyed the iPhones
It allowed me to write my opinion about it. Everybody could read.
Nope
Nothing
Nothing
No
Read the information
No
Take better quality pictures
Yes

# Bibliography


Anglis, S., (2006) *"Why go handheld?"*, Museum Practice 34, pg.46

Arthur, C., (2010) *"Digital Economy Bill passes third reading"*, The Guardian http://www.guardian.co.uk/technology/2010/apr/08/digital-economy-bill-passes-third-reading, Accessed 13/07/10

Ballard, B., (2007) *"Designing the mobile user experience"*, Chichester, John Wiley and Sons Ltd.

Becker, H., (2000) *"Pedagogical motivations for pupil computer use that lead to student engagement"*, Educational Technology, 40 (5), pp.5-17

BECTA, (2008) *"What the research says about ICT and motivation"*, British Educational Communications and Technology Agency http://research.becta.org.uk/upload-dir/downloads/page_documents/research/wtrs_motivation.pdf, Accessed 16/08/10

BECTA, (2009), *"Evidence on the impact of technology on learning and educational outcomes"*, London, BECTA

BECTA, (2009) *"Narrowing the Gap: Literature Review"*, London, BECTA

Billings, S. (2009) *"Upwardly Mobile"*, Museum Practice 46, pp. 30 – 34

Cannadine, D., (2001) *"Ornamentalism. How the British saw their Empire"*, London, Penguin.

Chan,S. (2009), *"QR codes in the museum – problems and opportunities with extended object labels"*, Powerhouse Museum, http://www.powerhousemuseum.com/dmsblog/index.php/2009/03/05/qr-codes-in-the-museum-problems-and-opportunities-with-extended-object-labels/ , Accessed 26/06/10

Creative Choices, (2008) *"Creative Choices, Practical: User-Generated Content and Cultural Activity"*, http://www.creative-choices.co.uk/digital-culture/creating-great-content/practical-user-generated-content-and-cultural-activity, Accessed 08/08/10

Creative Choices, (2008) *"Transforming Culture with Mobiles"*, http://www.creative-choices.co.uk/digital-culture/technology/transforming-culture-with-mobiles, Accessed 08/08/10

Dawson, D., (2007) *"e – Guidelines 12:Handheld Technologies for mobile learning"*, Leicester, National Institute of Adult Continuing Education

Doyle, J. and Ward Doyle, M., (2010) *"Mixing Social Glue with Brick and Mortar: Experiments Using the Mobile Web to Connect People, Objects, and Museums"*, In J. Trant and D. Bearman (eds), "Museums and the Web 2010: Proceedings", Toronto, Archives & Museum Informatics
http://www.archimuse.com/mw2010/papers/doyle/doyle.html , Accessed 15/08/10

Duncan – Howell, J., and Lee K. T. (2007), *"M – Learning: finding a place for mobile technologies within tertiary educational setting"*, Ascilite 2007, http://www.ascilite.org.au/conferences/singapore07/procs/duncan-howell.pdf, Accessed 16/07/10

Field, A., (2000) "*Discovering Statistics: Using SPSS for Windows"*, London, Sage Publications

Futurelab, (2004) *"Report 11: Literature Review in Mobile Technologies in Learning"*, London, Futurelab

Garrison, D and Vaughan, N (2008) *"Blended learning in higher education: framework, principles, and guidelines"*, San Francisco, John Wiley and Sons

Golden, S., McCrone, T., Walker, M., and Rudd, P., (2006) *"Impact of e-Learning in Further Education: Survey of Scale and Breadth"*, London, National Foundation for Educational Research

Hague, C., and Payton, S., (2010) *"Digital Literacy across the Curriculum"*, Futurelab, http://www.futurelab.org.uk/resources/publications-reports-articles/handbooks/Handbook1706, Accessed 14/07/10

Harnett, P., (2007) *"Exploring the potential for history and citizenship education with primary children at the British Empire and Commonwealth Museum in Bristol"* International Journal of Historical Learning, Teaching and Research, 7 (1), http://www.heirnet.org/IJHLTR/journal11/Harnett.doc, Accessed 15/07/10

Harris, S., and Kington, A., (2002) *"Innovative classroom practice using ICT in England: the second information technology in education study (SITES)"*, The National Foundation for Educational Research in England and Wales
http://www.nfer.ac.uk/research/down_pub.asp , Accessed 23/07/10

Hein, G. E., (2000) *"Learning in the Museum"*, Oxon, Routledge

Higher Education Funding Council for England, (2006) *"Intellectual Property Rights in e – learning",* London, Higher Education Funding Council for England

Hooper – Greenhill, E., (2000) *"Museums and Visual Culture"*, Oxon, Routledge

Hooper – Greenhill, E., (2007) *"Museum and Education: Purpose, pedagogy, performance"*, Oxon, Routledge

Hooper-Greenhill, E. (ed.), (2007) *"Inspiration, Identity, Learning: The Value of Museums Second Study"*, London, DCMS

Jackson, M. (2008) *"Information overload: Switch off your mobile, iPod, and emails - technology is turning our brains to mush"*, The Daily Mail, originally published 30/07/08 http://www.dailymail.co.uk/sciencetech/article-1039993/Information-overload-Switch-mobile-iPod-emails--technology-turning-brains-mush.html#ixzz0xdo2dfi6, Accessed 13/08/10

Kukulska-Hulme, A., Sharples, M., Marcelo, M., Arnedillo-Sánchez, I., Vavoula, G, (2008) *"Innovation in Mobile Learning: a European Perspective",* http://www2.le.ac.uk/Members/gv18/downloads/publicationpreprints/journals/Kukulska-Hulme-et-al.-IJMBL-preprint.pdf , Accessed 02/08/10

Lagoudi, E. and Sexton, C., (2010) *"Old Masters at Your Fingertips: the Journey of Creating a Museum App for the iPhone and iTouch",* In J. Trant and D. Bearman (eds), "Museums and the Web 2010: Proceedings", Toronto, Archives & Museum Informatics, http://www.archimuse.com/mw2010/papers/lagoudi/lagoudi.html , Accessed 15/08/10

Lave, J. and Wenger, E., (1990), *"Situated Learning: Legitimate peripheral participation."* Cambridge, Cambridge University Press

Leftwich, M., (2009) *"Blending E-learning and Museum Practice"*, Museum ID http://www.museum-id.com/museum_articledetails.asp?newsID=129, Accessed 26/06/10

Lenhart, A., Arafeh, S., Smith, A., and Macgill, A., (2008) *"Writing, Technology and Teens"*, Pew Research Centre http://www.pewinternet.org/Reports/2008/Writing-Technology-and-Teens.aspx, Accessed 20/08/10

Lonsdale, P., Bryne, W., Beale, R., Sharples, M., and Baber, C., (2004) *"Spatial Awareness for mobile learning in a museum",* Birmingham, University of Birmingham

Miller, S. (2007), *"Conversation: A history of a declining art."*, Yale: Yale University Press

Museum of London, (2010) *"The Singh Twins "enTWINed"",* http://www.museumoflondon.org.uk/English/EventsExhibitions/Special/SinghTwins.htm, Accessed 10/08/10

Okunbor, D. and Guyy, R.,(2008) *"Analysis of a mobile learning pilot study"*, Fayetteville State University, http://digitalcommons.uncfsu.edu/cgi/viewcontent.cgi?article=1002&context=macsc_wp, Accessed 10/07/10

Orna-Ornstein, J. (ed.), (2001) *"Occasional Paper No. 140: Development and Evaluation of the HSBC Money Gallery at The British Museum"*, The British Museum,http://www.britishmuseum.org/research/research_publications/online_research_publications/hsbc_money_gallery.aspx, Accessed 8/07/10

Pachler, N. (ed.), (2007) *"Mobile Learning: Towards a research agenda*", London, The WLE Centre

Parry, R., (2007) "*Recoding the Museum: Digital Technologies and the Technologies of Change*", London, Routledge

Petrie, M. and Tallon, L. (2010) *"The iPhone Effect? Comparing Visitors' and Museum Professionals' Evolving Expectations of Mobile Interpretation Tools"*, In J. Trant and D. Bearman (eds), "Museums and the Web 2010: Proceedings", Toronto, Archives & Museum Informatics ,http://www.archimuse.com/mw2010/papers/petrie/petrie.html , Accessed 15/08/10

Petrova, K. and Chun Li, C., (2009) *"Evaluating mobile learning artefacts. In Same places, different spaces",* Ascilite Auckland 2009, http://www.ascilite.org.au/conferences/auckland09/procs/petrova.pdf, Accessed 16/08/10

Pisano, S. (ed.), (2010) *"Museum of London: Museum Highlights"*, London, Scala Publishers Ltd.

Pumpian, I., Fisher, D., and Wachowiak, S., (2006) *"Challenging the Classroom Standard Through Museum – based Education"*, London, Lawrence Erlbaum Associates

Salgado, M., Saad-Sulonen, J., and Díaz, L. (2009) *"Using On-line Maps for Community-Generated Content in Museums"*, Media Lab- University of Art and Design Helsinki (TAIK), http://www.archimuse.com/mw2009/papers/salgado/salgado.html, Accessed 30/07/10

Stephens, S. (2010) *"Mobile Phone Apps",* Museum Practice, http://www.museumsassociation.org/museum-practice/apps, Accessed 20/06/10

Tallon, L., and walker, K. (eds.) (2008) *"Digital Technologies and the Museum Experience: Handheld Guides and Other Media"*, Plymouth, Altamira Press

The Historical Association, (2007) *"T.E.A.C.H: Teaching Emotive and Controversial History 3 - 19"*, London, the Historical Association

Thomas, S. and Mintz, A., (2000) *"The Virtual and the Real: Media in the Museum"*, Washington, American Association of Museums

Trant, J., (2009) *"Tagging, Folksonomy and Art Museums: Results of steve.museum's research"*, University of Toronto / Archives & Museum Informatics, http://conference.archimuse.com/files/trantSteveResearchReport2008.pdf, Accessed 01/08/10

Traxler, J., (2007). *"Defining, Discussing, and Evaluating Mobile Learning: The moving finger writes and having writ…"*, International Review of Research in Open and Distance Learning, 8(2)

Traxler, J., and Kukulska – Hulme, (2005) "Evaluating Mobile Learning: Reflections on Current Practice", M - Learn 05, http://mlearning.noe-kaleidoscope.org/public/mlearn2005/www.mlearn.org.za/CD/papers/Traxler.pdf, Accessed 01/08/10

Van Daal, V., Reitsma, P., (2000) *"Computer-assisted learning to read and spell: results from two pilot studies"*, Journal of Research in Reading, 23 (2), pp. 181-193

Vavoula, G. N., and Sharples, M., (2008) *"Challenges in Evaluating Mobile Learning",* M – Learn 08, http://www.lsri.nottingham.ac.uk/msh/Papers/mlearn08_VavoulaSharples_preprint.pdf , Accessed 01/08/10

Weil, S. E., (2002) *"Making Museums Matter"*, London, Smithsonian Institution Press

## Websites

www.archimuse.com

www.ascilite.org.au

www.mlearn2010.org

www.museumsassociation.org

www.museumscomputergroup.org.uk/

www.museumoflondon.org.uk

www.nhm.ac.uk

www.powerhousemuseum.com

www.singhtwins.co.uk

www.wordpress.com

*The blogs created during the gallery activity can be viewed in full at:*

http://molalexflowers.wordpress.com/

http://impactofempire1.wordpress.com/

http://impactofempire2.wordpress.com/

http://impactofempire3.wordpress.com/

Department of Art, Design and Museology,
Institute of Education, University of London
20 Bedford Way
London WC1H 0AL
www.ioe.ac.uk