How can digital services enhance museum learning and partnerships with schools?

Digital research strand of the ‘Stronger Together’ action research programme

March 2015

Bridget McKenzie

Flow UK, part of Flow Global
152 Waller Road, London SE14 5LU

www.flowglobal.co.uk
# Table of Contents

Executive summary ........................................................................................................................................... 4

1. About this research ........................................................................................................................................ 4

2. Key findings: How can digital services enhance museum learning and partnerships with schools? ...... 6
   2.1 Overview of the context .......................................................................................................................... 6
   2.2 What are the key characteristics of good practice? ............................................................................... 7
   2.3 Types of innovative digital projects ....................................................................................................... 7
      2.3.1 Overview ......................................................................................................................................... 7
      2.3.2 Museum learning activities using a range of digital tools ............................................................... 7
      2.3.3 Apps and games about or using museum content ......................................................................... 8
      2.3.4 Digital services that aggregate or promote museum resources for educational audiences ....... 8
      2.3.5 Digital services or platforms that aggregate or promote museum content for any users .......... 8
      2.3.6 Exceptions to these types .............................................................................................................. 9
   2.4 Comparing regional, national and international practice ..................................................................... 9
      2.4.1 Note on comparisons ..................................................................................................................... 9
      2.4.2 Regional case studies .................................................................................................................... 10
      2.4.3 National case studies .................................................................................................................... 11
      2.4.4 International case studies ........................................................................................................... 12
   2.5 General trends in perceptions of good digital practice ........................................................................ 12
   2.6 Recommendations from creative discussion event ............................................................................ 13
      2.6.1 About the event ............................................................................................................................. 13
      2.6.2 Evaluation and impact ................................................................................................................... 13
      2.6.3 Quality experiences ..................................................................................................................... 14
      2.6.4 School-museum communication .................................................................................................. 14
      2.6.5 Professional development ............................................................................................................ 15
      2.6.6 Enduring learning ........................................................................................................................ 15
   2.7 Conclusions and ways forward .......................................................................................................... 15

3. Background to digital and cultural learning .............................................................................................. 16
   3.1 Introduction to the digital learning context .......................................................................................... 17
   3.2 Literature review: Evaluations of museum learning websites .......................................................... 18
      3.2.1 Webquests ..................................................................................................................................... 18
      3.2.2 Science Museum: Summary of teachers’ use of websites ............................................................ 19
      3.2.3 Brought to Life ............................................................................................................................ 19
      3.2.4 Launchball .................................................................................................................................... 20
      3.2.5 Tate’s digital platform .................................................................................................................. 20
      3.2.6 Wondermind ............................................................................................................................... 20
      3.2.7 Fire of London ............................................................................................................................. 21
      3.2.8 Hecht Museum ............................................................................................................................ 22
      3.2.9 Evaluating games .......................................................................................................................... 22
      3.2.10 Getty report on teacher use ....................................................................................................... 23
      3.2.11 IWM resources .......................................................................................................................... 23
      3.2.12 FWW Centenary resources ...................................................................................................... 23
   3.3 Understanding the main interest groups in digital cultural learning .................................................. 22
      3.3.1 Overview ..................................................................................................................................... 22
      3.3.2 Cultural organisations .................................................................................................................. 24
      3.3.3 Educational organisations .......................................................................................................... 25
      3.3.4 Digital organisations ................................................................................................................... 25
   3.4 Defining terms around digital ................................................................................................................ 24
3.5 Vendor, Partnership and Remote Models

3.5.1 Overview

3.5.2 Vendor model

3.5.3 Partnership model

3.5.4 So, what is a Remote model?

3.5.5 Good practice in a Remote model

3.6 Digitally enhanced museum learning pathways

3.6.1 A learning pathway is a story of change

3.6.2 Five factors in quality cultural and creative learning

3.6.3 Schools, Museums and Digital as three agents in the pathway

3.6.4 The direction of innovation

3.6.5 How learner pathways can be missing from developments in digital culture

3.6.6 Ideal learner pathways

4. Analysis of the digital case studies

4.1 Regional case studies

4.2 National Case Studies

4.3 International Examples
Executive summary

1. About the research

Flow UK was commissioned to carry out one of the research projects as part of the ACE-funded Stronger Together initiative. It asks: What role are digital technologies playing in Museum Learning around the world? And how can we incorporate this best practice to strengthen partnerships between schools and museums at The Langley Academy and beyond?

We conducted background research to outline the context of digital museum learning, conducted a survey and mapping exercise to capture good practice internationally, nationally and in the project region. We held a workshop with museum and school educators and produced a full report, of which this is an executive summary.

In a surveying exercise, we identified types and examples of digital outputs cited as good practice:
- Creative activities in museums using a range of digital tools (especially tablets and their apps)
- Apps and games about or using museum content, for use outside of museums or both inside them and at home (e.g. Gamar)
- Digital services that aggregate or promote museum resources for education (e.g. MOOCs)
- As above, but generic or public open resources not targeted at educational users but still used by them (e.g. Google Cultural Project or Historypin).

Some of the practice included Stronger Together projects such as: Amersham Martyrs and the use of Skype following a visit to River & Rowing Museum.

2. Features of good practice in digital museum learning

- Open data and shareable content: Freeing content from the museum so that it can be used and mashed up by educators and learners in other platforms.
- Virtuality: Making place-based and real-time cultural and heritage experiences available to virtual visitors, while still encouraging visits to real places. The cultural experience should be made as accessible and exciting as possible to remote audiences.
- Empowerment: Putting interpretation into the hands of learners, using creative digital tools and a social approach. Learners and teachers should be enabled to lead their own learning pathways.
- Conversation: More communication between museum staff and schools, with different experts within and outside museums not just educators, more frequently and more linked to relevant resources.

3. Conclusions and ways forward

- Museums and schools can use technology to tackle challenges together, but prioritise expertise, dialogic methods and access to culture
- Museums and schools can acknowledge their differences, although technology is blurring roles. Museums can use digital to support teachers & learners to tap the power of objects and sites.
- Model and support learning pathways optimally geared to progress by individual learners (e.g. encourage independent study skills, use open digital badges)
- Teachers need training to be aware of, use and contribute to digital cultural resources
- There is a gap in research reviewing the impact of digital museum learning resources on the education sector. This could be an opportunity for collaboration.
- Keep up with change: Digital learning is moving beyond provision of web-based resources, towards a more blended and active approach, where learners are programmers and makers.
1. About this research

This report is the conclusion of the digital research strand of the ACE-funded ‘Stronger Together’ project, which explores and amplifies The Langley Academy’s Museum Learning in partnership with the River and Rowing Museum and other museums and schools across Berkshire, Buckinghamshire and Oxfordshire.

There are four components to the project, which ran from May 2014 to March 2015:

- 30 champion bursaries for teacher-museum professional collaborations on Museum Learning projects
- 3 action research projects (curriculum change, new technology, internationalism)
- Sharing the project activity and outcomes: two conferences (2014 and 2015) and via development of dedicated microsite (currently under development)
- Kings College London (Department of Education) is evaluating the project.

This strand of work is one of three action research projects. It asks:

- What role are digital\(^1\) technologies playing in Museum Learning projects around the world?
- Learning from this, how can we incorporate digital technologies to strengthen learning partnerships between schools and museums at The Langley Academy and beyond?

‘Stronger Together’ explores a Partnership model where museums and schools work together, rather than a Vendor model. The Digital research explores how digital can support partnership working, partly by enhancing the museum experience, partly by improving Remote learning.

These were the steps taken to answer the two main questions:

**Planning and preparation**
- Understanding more about the aims and plans for the Stronger Together project
- Set up meetings with project leads
- Refinement of research plan

**Carrying out a contextual review**
- Review of research into the impact of online museum resources on the educational sector
- Analysing the factors that both nurture and hamper progress, and different agendas in the cultural, educational and digital sectors
- Identifying the qualities of innovative and good practice

**Surveying, mapping and analysing good practice**
- Conducting our own searches of good practice, gathering them in a Pinterest board\(^2\)

---

\(^1\) We've changed the term 'new' to 'digital' because new is a very broad term which could include engineering and manufacturing. Increasingly, digital technologies are influencing and being integrated into these more material domains, but we should focus on digital technologies for communication and creativity.
2. Key findings: How can digital services enhance museum learning and partnerships with schools?

2.1 Overview of the context

All learners and audiences are able to communicate, learn and create very differently now because of the World Wide Web, social networking and collaborative creative media, so their expectations are raised about the sophistication of media. Their experience of the world through these digital media may have opened up their outlook to other cultures, to political issues, to potential careers, and to more informal or game-based ways to learn.

There are new opportunities for museums and schools to develop projects and to build and maintain learning partnerships. There is also a challenge to connect with learners’ new interests and expectations from accessing the internet. These possibilities may be both particularly valuable and particularly challenging in small museums.

There are also key resource challenges and digital opportunities for schools located further away from any museum, or from any particular museum that serves their current need. However, digital is not a straightforward solution. For example, if schools are only able to take advantage of Skype lessons given by museums, they may lack some of the benefits of object-based learning or outdoor visits.

That said, this research aimed to acknowledge and explore the breadth and potential of Museum Learning as technologies emerge. The Stronger Together project demonstrates that Museum Learning is about much more than ‘school trips to museums’ but is about accessing a wealth of culture through a multitude of resources and approaches.

Please read Section Three for further background research about the context and impacts of digital learning in and with museums.

2 For all digital projects found in our own searches, and cited in the survey, see http://uk.pinterest.com/bridgetmck/digital-cultural-learning/

3 The survey https://docs.google.com/a/flowassociates.com/forms/d/1dvEl-F1NyzKuPYtgpY4npU_L6EmNlu9q9UKqYtigz6M/viewform
2.2 What are the key characteristics of good practice?

The survey of good practice suggested that innovation and good practice in digital museum learning has the following characteristics:

- **Open data and shareable content:** Freeing content from the museum so that it can be used and mashed up by educators and learners in other platforms.
- **Virtuality:** Making place-based and real-time cultural and heritage experiences available to virtual visitors, while still encouraging visits to real places. The cultural experience should be made as accessible and exciting as possible to remote audiences.
- **Empowerment:** Putting interpretation into the hands and settings of learners, using creative digital tools and a social approach. Learners and teachers should be enabled to lead and develop their own learning pathways.
- **Conversation:** Allowing more communication between museum staff and schools, with different experts within and outside museums not just educators, more frequently and more linked to relevant resources. For example, students could be helped to build a relationship with a museum staff member before and after visits, or to gain insight into museums as workplaces. Enquiry-based pedagogy can be stretched through innovative uses of new technology.

2.3 Types of innovative digital projects

2.3.1 Overview

In our surveying and mapping exercise, we identified the following as the types of digital outputs (projects or services) that were cited as good practice:

- **Creative activities** in the museum using a range of digital tools (especially tablets and their apps)
- **Apps and games** about or using museum content, for use outside of museums or both inside them and at home (e.g. Gamar)
- **Digital services** that aggregate or promote museum resources for educational audiences (e.g. MOOCs)
- As above, but **generic or public open resources** not targeted at educational users but still used by them (e.g. Google Cultural Project or Historypin).

For more analytical detail about each type of resource see the tables in Section Four, and here is a summary below.

2.3.2 Museum learning activities using a range of digital tools

- Within museums these examples enhance workshops and methods of interpreting collections, for example:
  - **Ashmolean Museum** developing use of existing iPad apps as educational tool
  - **The Story Museum** in Oxford forming a group of young people to devise a digital/hybrid Games Room in the museum
Within museums, these examples use the spaces as an inspiring setting to develop digital skills e.g.
- **Codasign** workshops in museums around the UK
- **Pitt-Rivers Museum** music composition sessions using iPad apps

Primarily driven by school agenda, these examples use digital tools and museum content, to enrich classroom based learning e.g.
- **Arbib House Sound** piece made by students about WW1
- School used Skype to follow up a visit to **The River & Rowing Museum**.

Primarily driven by digital agenda, these examples offer open potential for activities to take place in museums or with museum content e.g.
- Mozilla’s Webmaker tools and its **Hive Learning networks**.

### 2.3.3 Apps and games about or using museum content

- Participatory design of apps, working with people such as school pupils or creative HE students, developing interpretation of museum content in innovative ways that could be made available to visitors e.g. Amersham Museum’s **Amersham Martyrs** app with Langley Academy.
- Quests led by the museum, designed for use within a museum/heritage setting, mainly on devices available on the visit or fixed in galleries e.g. **HRP’s Explorers quests**
- Available independently of a museum visit but designed to encourage visits and be used to augment reality (AR) in the museum e.g. quest games on the **Gamar app platform**
- Designed to take museum content into remote digital experience, for primarily educational and/or commercial reasons e.g. **MOMA’s ArtLab iPad app**.

### 2.3.4 Digital services that aggregate or promote museum resources for educational audiences

- Services led by individual museums or museum-generated partnerships e.g. the British Museum’s **Teaching History with 100 Objects**
- Services led by, or arising from legacies of, public sector agencies such as ACE or museum development bodies e.g. **MyLearning**
- Services led by independent companies or non-profits e.g. Culture24’s **Connecting Collections**, **Khan Academy’s** museum channels or museum courses hosted on MOOC platforms like **Coursera**.

### 2.3.5 Digital services or platforms that aggregate or promote museum content for any users, including education

- Primarily driven by the museum wanting to make its content digitally available for reuse e.g. **Rijksmuseum Studio** (users share creative designs with museum images)
- Primarily driven by public agencies wanting to open and join up the cultural commons e.g. **Europeana**
- Primarily driven by independent companies wanting to generate brand awareness, innovation, profit or public good e.g. **Google’s Cultural Institute** or **Shift’s Historypin**.
2.3.6 Exceptions to these types

Some other projects are difficult to categorise in the ways noted above.

Category defying by crossing from a curatorial data project to a schools offer:

- **Tag London**: a platform with teacher’s lesson plans, to encourage KS2-3 students to tag the Museum of London’s collections. (Although crowdsourced tagging has been around since 2007 or so, it is unusual to present it as a school’s resource.)

Not quite relevant, but interesting as an example of partnership capacity-building:

- **Digital Narratives**: Capacity building programme across Hampshire museums, which encouraged digital storytelling and use of social media.

2.4 Comparing regional, national and international practice

2.4.1 Note on comparisons

It is difficult to distinguish all of the digital projects found in the survey neatly into geographical categories. Several of the international case studies are services that can be used by individuals or organisations at a regional level, and conversely some of the national case studies are UK organisations using international services.
2.4.2 Regional case studies

There is plenty of innovative practice in the Berkshire, Oxfordshire and Buckinghamshire (BOB) region, especially cited about University of Oxford museums. There are really creative uses of iPad apps. For example the Ashmolean Museum explores the use of graphic tools by school groups to encourage interpretation in the galleries, and the Pitt-Rivers Museum uses the Feed app to make music composition from ambient sounds in the museum very visual and exciting.

Collage made by Grace in a workshop session inspired by Manet’s portrait of Mme Claus using iPads at Ashmolean Museum

Smaller museums such as Amersham Museum are also making good use of new online tools such as Historypin, but generally have less capacity to do lots of projects that target particular learning groups. The Stronger Together project has allowed them to develop an app with Langley Academy students where students filmed promenade performances of the Amersham Martyrs story, uploaded this so that it can be accessed in key sites in the town using QR codes.

The River and Rowing Museum was cited as using tools such as Skype to follow up with students after visits, so that students could demonstrate what they had learned and explored since.

From our other research⁴, we know that cultural organisations and schools are starting to work together at a local level to explore digital creativity. These activities include use of coding

---

⁴ e.g. Extending Digital Practice, for Artswork South East which includes schools and the Story Museum in Oxford
platforms such as Scratch, the use of open-ended gaming platforms such as Minecraft, the use of Google Apps for Education as an integral system for school IT, and exploring 3D digital making with cheap devices such as Raspberry Pi or MakeyMakey.

2.4.3 National case studies

There is by now a proliferation of cultural learning websites, online resources, apps and digital creativity workshops produced by museums, partnerships, agencies and schools across the UK. Many of these may have relatively innovative features and be of national relevance, but there may be many reasons why they are less well known or used:

- Time-limited project funding so sites go static or offline
- Reducing capacity for outreach, educational or digital content staff means that sites aren’t evaluated, promoted or grown
- Too much energy in starting from scratch with small projects, not enough collaboration, and not making enough use of third-party tools (that are often free and capture ‘eyeballs’)

The projects cited as good practice were from large national museums, or well established independent organisations, where there is more capacity to innovate as well as to promote and sustain their projects. They were either experimental (e.g. Tate Worlds Minecraft maps or Museum of London’s Tag London project) or strategic projects by independent organisations (e.g. Culture24’s Connecting Collections).

There are also a number of other digital projects that weren’t cited that potentially offer content for educational audiences, including many projects for the 1st World War Centenary and for Waterloo200, and digital cultural projects from ACE and NESTA such as The Space.
2.4.4 International case studies

The international projects cited tended to be showing the use by schools and museums of ‘third party’ tools or platforms, such as Google Cultural Project or Historypin. These offer resource banks for creative re-use by teachers and learners.

Similarly, two citations exemplified museum partnerships with MOOCs (massively open online courses), including MOMA’s Art & Inquiry course and Tate’s partnership with Khan Academy. These are all resources bound to grow as more museums and educators feed them with content. A few years ago, we might have seen more websites custom-built for museums cited as good practice.

There may be international good practice from beyond the Anglophone world, but finding them would require a bigger and multilingual survey.

Google Art Project’s User Galleries

2.5 General trends in perceptions of good digital practice

There are of course different professional perspectives on what constitutes good practice:

- Teachers tend to mention tools such as Skype, Google Apps for Education or Pinterest, as well as aiding classroom learning around a museum experience.
- Digital educators tend to promote activities that encourage coding and 3D digital making.
- Museum staff tend to focus on how technology can enhance the experience of the museum, for example, using iPads as creative tools to respond to collections.
- Digital culture experts focus on emerging new technologies and the strategic uses of third-party platforms.
That said, a few common trends or concerns can be identified:

- Both the education and cultural sectors are experiencing pressures of time and resources, and requirements to prove impacts and attainment in more quantitative ways. There is an interest in technologies that enable efficient joined-up use of resources (e.g., the use of free open tools) and that seamlessly showcase and track learners’ outputs and progress.

- Educators in museums and schools have a shared desire for digital services to allow them to communicate better. This might include, for example, students building a relationship with a museum staff member before and after visits, or gaining insight into museums as workplaces, or teachers being able to quickly showcase learners’ responses to museum experiences.

- There were very few citations of products that get young people involved in a particular cultural discipline, except the discipline of digital making. Most were fairly broadly about the arts, humanities and history rather than STEM or other subjects.

- Playful digital resources are highly valued. A key trend is following young people’s enthusiasm for digital tools that allow open-ended creativity. Minecraft was the most cited example, as it offers many possibilities to create environments and artefacts. (For example, Tate Worlds Minecraft maps and EPIK’s guide to achieving Arts Award through Minecraft.)

### 2.6 Recommendations from creative discussion event

#### 2.6.1 About the event

Teachers, museum educators and digital educators from across the project region were invited to a creative discussion event at the Natural History Museum Oxford on 25th February 2015. At this Flow presented findings from the survey and introduced some key principles of good practice. We emphasised the importance of high quality cultural experiences and learning approaches, based on enquiry. We described how digital can support a ‘learning pathway’ for students, increasing curiosity and participation in museums or cultural topics/activities. We also introduced the idea that technology can make the whole world a museum, a vibrant grid of things and information, an inspiring learning resource.

This was followed by sharing of practice and discussion about how museums and schools could work better together to maximise the use and quality of digital services. The following suggestions arose from this discussion.

#### 2.6.2 Evaluation and impact

- To bolster evaluation of good digital practice, one could look at how to use the ACE quality principles for children and young people.
• Consider how ACE’s new ways of measuring museum KPIs could allow for more counting of online or digital outreach. This could encourage museums to put more resources into digital content.

• Participants asked if we need more evidence about the value and impact of making museum learning available remotely. How much research has there been on this?

2.6.3 Quality experiences

• Consider the ways digital can contribute to an immersive experience (for example, like Punchdrunk’s Against Captain’s Orders show at the National Maritime Museum, or the all-round impact of a special heritage site).

• Learners and teachers need time to absorb the impact of a museum visit or cultural experience, both in preparation and response. It was suggested that we plan ways to use digital tools to extend learners’ experience over a longer period of time. For example, we should encourage museums to use Skype to follow up visits, for museum staff to see how students have progressed with challenges set. (This helps with the issue of taking secondary school pupils out on visits. For example, a small group could make a real visit but the whole year can connect by Skype.)

• Consider a Flipped Classroom model, so that museums issue a video, podcast or skype introduction, or a challenging task before the visit, so that the visit itself can be spent in active dialogue or making, rather than absorbing information.

• Encourage use of local heritage resources such as historic houses, landscape archaeology or streets, enhanced by online information, if schools can’t easily or often visit a museum. Tap into the new emphasis on local studies in the new History curriculum and field studies in Geography.

2.6.4 School-museum communication

• How could a digital approach be used to enable more shared learning, planning and preparing between schools and museums? More conversation around a visit would clarify roles, draw out knowledge on both sides, and reduce any awkwardness when teacher hands over teaching role to museum staff or artists. Also, teachers can be tired and busy with practical matters on visits, and might miss opportunities to reinforce learning.

• If schools use up-to-date technology infrastructure, such as Google Apps for Education and fewer blocks on certain kinds of interactive content, it is easier for museums to serve school needs.

• As it is increasingly difficult for museums to communicate with schools via local authorities, as local management of schools is being reduced, what other channels are there to promote the best resources?

• Exam boards were seen as one good route because museums need to explore how to support new areas of exam syllabi and the National Curriculum. Exam boards produce the textbooks and resources that they then examine on.
2.6.5 Professional development

- Could museums offer CPD for teachers on how to use online museum resources in school, how to use creative digital tools in museum visits, or on how to deliver the new Computing curriculum with museum content? (Schools usually offer 2 days a year for individual teacher training.)
- Could museums investigate how to get their online/digital resources into Initial Teacher Training courses? ITT does include more about digital resources/tools but it misses out culture and museums.
- Setting up online networks for teachers or cultural learning partnerships is often problematic as many participants don’t visit or post on the platform. Keep networks small and focused on particular projects (such as joint funding bids).

2.6.6 Enduring learning

- To help children deal with complex ideas about chronology (or global development of cultures) explore how digital tools could offer a personalised recording place that endures and is refined throughout their time at a school. For example, they might use a timeline tool (e.g. TikiToki) to manage their own personal timeline, combining learning about history at school and home.
- This idea could be extended so that similar tools could be used by children record children’s understanding of categories or classifications, such as the links between different global cultures, or animal species or the meanings of words.

2.7 Conclusions and ways forward

Many good suggestions were offered at the discussion event, listed above. This conclusion reinforces some of the key principles of these recommendations and includes additional ideas arising from other conversations and research.

2.7.1 Museums and schools can use technology to tackle challenges together

Schools and museum educators have some common issues, whereby either digital technology presents challenges, or digital can positively help tackle challenges.

- Both schools and museums are under pressures of resources, and need to prove outcomes in more quantitative ways. Both need technologies that enable efficient joined-up use of resources, for example to track the impact of museum visits, or for teachers to easily share work inspired by museum content.
- Both museums (especially smaller, local ones) and schools can experience problems with access to third-party online platforms such as Google/Skype or social media. Potentially, by working together on a digital R&D project, they could use it as a persuasive lever to unlock such blocks, or at least to find ‘workarounds’ to them.
- It is important not to let excitement about new technologies overwhelm the value of creative and cultural learning. There is a danger that museums might invest in digital staff over museum learning experts. Schools need to respond to the new Computing curriculum, but
along with other demands (new National Curriculum, new standards, teacher shortages etc.), creative experiment and cultural enrichment are likely to suffer.

2.7.2 Museums and schools can acknowledge their differences

The advent of digital technologies has a tendency to blur distinctions between cultural and educational contexts. Digital can put the resources for learning and accessing cultural heritage at our fingertips wherever we are, at home, in the museum, in the landscape or in the classroom. However, it is important to acknowledge the distinctive value of each type of organisation and the learning methods that take place within them. Museums collect, protect and conserve artefacts, and interpret them through contextualisation and deep enquiry into materials, systems and cultures. Schools protect and nurture young people, and develop their capacities by mediating their relationships with the wider world.

Digital learning projects should aim to enhance the core functions of both. For example, museums should not try to deliver digital resources that exactly or strictly deliver curriculum and syllabi learning outcomes. Rather they need to support teachers to tap the rich power of objects, and to enrich classroom learning with enquiry-based approaches.

2.7.3 Support the learning pathway

Museum educators (and museum schools such as Langley Academy) could work together to model and develop ideal learning pathways. They could design any new online resources by asking: how can Museum Learning be optimally geared to the growth of individual learners, via the enhancement of digital technologies? These new services would be resources that call for maximum learner involvement in enquiries, tools to help learners be aware of their own development, and encouragement to follow their own paths of interest or share their creative responses. See the ideas in section 2.6.6 about supporting chronological learning. Other tactics might include making more use of Mozilla’s digital Open Badges to reward learning. We might then see a solid foundation of playful and inventive activity continuing throughout their phases of interaction with culture through digital means.

2.7.4 Support teachers to use and contribute to digital museum resources

In the discussion group, there was strong support for diverse forms of teacher training in digital museum learning. These forms might include:

- CPD sessions that demonstrate how networked portable devices can be used in museum and heritage sites, either to give a taste of pre-existing workshops or to enable teachers to design their own activities.
- A consortium of museums could work together to offer a MOOC, or an online course for educators in how to use online museum resources to enhance classroom learning.
- A training toolkit that could be used in Initial Teacher Training, by Teaching Schools and colleges.
• More co-ordinated provision of information to schools about what online resources exist (for example, a shared e-newsletter).  

2.7.5 Impact research

In a context of reduced resources for museum learning, it is important that commissioners of new digital services are clear about their purpose from the outset. Good practice should always include researching to see where there are gaps in provision, and pointing to or repurposing any existing assets. Going deeper than this, it could be worthwhile for museums (or funders) to collaborate on impact research. We discovered that there is inadequate research reviewing the impact of digital museum learning resources on the education sector. Specific web projects have been evaluated, but there is very little evidence about how they have supported improvements in schools or informal learning, and what provision works best.

2.7.6 Keep up with innovations

Digital technology is increasingly putting learning and creativity into everyone’s hands. It is democratising and disruptive of norms. Digital practice is starting to move beyond the provision of web-based resources, towards a much more blended and active approach, where, for example:

• creative digital tools are used by learners to make their own interpretive content
• information can be embedded into objects in the world (for example, in 2D or 3D reproductions of museum objects, displayed in schools or elsewhere) and accessed on mobile devices
• children and young people expect to be engaged in the most active ways, designing their own games or programming their own devices.

Computing devices for coding, making, gaming and connecting things are becoming extremely affordable so that they are not beyond the reach of small museums and schools. Museums and schools (e.g. Coding Clubs in schools) can collaborate to hold hack days or shared learning events to develop confidence and new skills.

3. Background research into digital learning and museums

3.1 Introduction to the digital learning context

Digital technology has progressed rapidly, becoming more about the possibilities of data connecting people, the world and ideas, than about information pushed out via websites. The Internet of Things and increasingly available mobile devices can make the whole world a museum, a vibrant grid of objects and learning opportunities.

5 Note that ACE has conducted research to inform planning of an online hub to help teachers find cultural resources linked to the National Curriculum.
The features of emerging digital technology make it potentially a tool for disruption of all existing practices and systems, including Museums and Education. It promises, or threatens, to create solutions to all our problems as well as problems we haven’t even considered. Digital can now be all over the curriculum, underpinning or enhancing many competencies. Digital learning is emerging simultaneously and together with new approaches to organising learning and teaching which are learner-led, collaborative, connectivist and project-based.

As digital learning has emerged and offered new possibilities, innovative models of learning have shifted from:

- being transactional, where packets of data, effort or reward are passed between teacher and student
- to being more transformational, where learners, teachers and communities of enquiry develop capacities through their interactions, and all take an active role.

However, while technology has moved on, both museums and schools in England have been subject to pressures that have emphasised curriculum delivery and keeping basic services going. This section provides background to the research by examining agendas, terminologies and concepts in technology and digital learning that could be used to motivate and drive progress in Museum and School partnerships.

3.2 Literature review: Evaluations of museum learning websites

We carried out a review of existing evaluation reports of museum learning websites, primarily to learn of any evidence of impact on the educational sector. The reports did not address such impacts, showing that there is a gap in research in this area.

3.2.1 Webquests


- WebQuests projects, especially if well supported by teachers, develop capacities that are helpful for digital literacy in the broadest sense, such as critical thinking, visual and multimodal literacy, and broadening contextual understanding.
- The fact that all WebQuests need so much teacher support, is not found to be encouraging of a more progressive learner-led approach. They could model and help sustain good practice, if they are used reflectively by teachers. However, these WebQuests don’t strongly deliver one of the unique features of museum education, which is a rounded, multi-layered, open-ended interpretation.
- They are not perceived to be wholly appropriate, or differentiable, for all learning levels
- Most teachers aren’t aware of or aren’t using WebQuests.
- 69% of teachers said that ‘images of museum objects’ were what they most wanted from museum services online, above all other provisions such as lesson plans. They were enthusiastic that the work had been done for them – of matching museum collections to topics – and that it provided an alternative to visiting museums. They seemed less aware of the benefits of several collections from different museums combined together.
In our observations, the museum collections weren’t often used as the stimulus for questioning and creative response. This is because the objects were pre-selected and often included in the quest format too rigidly or illustratively.

Collection images were too small and were constrained within the frames, to the extent that users considered sourcing the images elsewhere on the web to carry out the quests.

Some of our observations showed that WebQuests can be fun for students, especially where group tasks, humour, performance and creativity were encouraged.

3.2.2 Science Museum: Summary of teachers’ use of websites

*Marie Hobson and Elin Simonsson, Science Museum, summary of findings on teachers’ use of museum websites, 2009*

- Teachers do not think of the Science Museum website as a place to look for teaching resources. The Science Museum website homepage and the Educators’ main page do not make it clear to teachers that they will be able to find teaching resources within them.
- Teachers frequently use websites in planning, delivering teaching and planning visits out of school. They vary greatly in their approaches and needs.
- A lack of time is a key factor so they need information to be brief and clear.
- Favourite web resources can be used over and over again, and shared widely.
- They don’t go to specific museum websites to look for resources, but search on a browser.
- They view museums as trusted sources, but alongside others such as universities, BBC or science institutes.
- Resources must be clearly linked to the National Curriculum and Key Stages.
- Resources must be free, and not require log-ins (although some log-ins as it makes them feel part of a club, but log-in process must be easy)
- You should not expect teachers to contribute to forums, but they do like to be invited to give constructive criticism about specific learning resources.

3.2.3 Brought to Life

*Evaluation of Brought to Life website on the history of medicine by Wellcome collection/Science Museum*

- Primary audience was formal learners of the history of medicine at GCSE to undergraduate level in the UK, their teachers and lecturers
- From the outset of the project all activities were developed in line with the needs of the target audiences. Front-end evaluation was carried out to identify the needs of students and teachers and how we could engage them.
- Was a success e.g. exceeded target visitor numbers and credited with beauty through its imagery and design, and a dynamism through its multimedia and thought-provoking prose.
- However, more work needs to be done to extend our reach to these target audiences. Integrating the site with the coursework and set curriculum of GCSE students and getting it on the reading lists of undergraduates of medicine would be the aim, making the site a mandatory element of any history of medicine course rather than part of extra study.
3.2.4 Launchball

*Evaluation of Launchball, 2008, Teresa Teireixa*

Although not aimed at educators, Launchball is a good example of an online activity that meets teacher’s needs by engaging children and stretching them:

- Launchball appeared to succeed in bringing the ethos of the Launchpad gallery online.
- KS2 and KS3 children thought Launchball was a fun and educational science game.
- Most children thought it was for children aged around 9-14 years old.
- The majority of children liked the problem-solving aspect of Launchball, as it made them think and figure things out by themselves.
- This evaluation of Launchball with KS2 and KS3 children revealed evidence of learning across four categories: cognitive, development of skills, affective and personal.

3.2.5 Tate’s digital platform

*Jen Ohlson and Elena Villaespesa, Researching and evaluating of young audiences on Tate’s digital platform, Feb 2015*

http://www.tate.org.uk/download/file/fid/46119

- Google analytics and heat map inform us that the “Resources” are the most visited part of the Tate Collectives site.
- Data from the Tate Collectives website survey and heat map inform us that visitors’ priority is to find out “What’s On” at Tate (Britain, Modern, Liverpool, St Ives) for young people, followed by information about Tate Collective, followed by “Browsing other people’s artwork”. Half of survey respondents have their own blog/website which requires us to offer something more unique rather than being another channel with the same functionalities.
- The (limited) social features of the Online Community are not being used properly, beyond minimal commenting. The Online Community is currently being used as a showcase platform, of which many others exist - eg, Tumblr, Cargo Collective or own websites.
- Data from the Tate website survey informs us that 32% of visitors to Tate’s website are under 30 (the highest percentage of visitors in aged 20–24) and mainly come with an intellectual purpose to carry out research on Art & Artists.
- Teachers and youth group leaders are also known to create profiles on the Tate Collectives site too.

3.2.6 Wondermind

*Sharna Jackson et al, Tate report on use of its Wondermind resources with input from educators and users*

http://www.tate.org.uk/download/file/fid/22039

Selected Findings
• Wondermind has value as a resource for teaching and learning about neuroscience, especially with non-scientific audiences. Respondents agreed that using sites like Wondermind to teach science topics through art and literature is more effective than traditional methods.

• Awareness of Wondermind was generally very low amongst respondents to the online survey. However, when informed of the site’s contents, respondents were interested in Wondermind and had high expectations of its quality, particularly due to its connection to Tate.

• Case studies suggested that the experience of using the site was generally positive, particularly for families. Teachers believed that Wondermind has had a positive impact on their pupils. However, teachers and parents both believed it was difficult to use Wondermind toward a larger objective – for example, planning a lesson around the site, or for continuous home study. There was a lack of explicit links to the curriculum, lesson plans, or strong ties to art generally.

• Some respondents, particularly teachers, suggested that as there is seemingly no new development, there is less impetus for long term use of the site.

• Teachers favourably compared Wondermind to other resources, noting the design quality and reactions from pupils.

3.2.7 Fire of London

Mariruth Leftwich and Martin Bazley, MoL evaluation of Fire of London resource and how teachers used it in class
Research conducted in 2006-2008

• Teachers are more likely to use images and collections databases than complex interactives.

• Experimentation should not be discouraged because it is important to keep challenging teachers to do more with the valuable digital assets that museums provide.

• The role of teachers, and their mindset about learning, is paramount in the effective implementation of Web-based resources.

• The difference in student achievement is related to the teacher and how he or she applies these resources to the students’ learning needs.

• Digital programs are best used in blended educational experiences, in which traditional aspects of the pedagogical process occur alongside the technology activities. The program helps, but does not substitute for, the teacher in the pedagogical activity.

• There is a responsibility on the part of those who provide teachers with content for the classrooms to understand the wide-ranging issues they face and to find ways to support their efforts.

• 67% of the eighty-five history teachers surveyed indicated that they use museum and archive Web sites with their students. Similar figures were found in The National Archives survey, with 57% stating that they use Learning Curve with students more than once a term. A larger percentage, 80% of the teachers in the Institute of Education study and 85% in The National Archives survey, use museum Web sites in lesson preparation.
• Designing with a whole class in mind e.g. using whiteboards is quite a different exercise from designing for an individual student to work with the resource.

• Teachers in each stage of consultation stated that they preferred to use Web sites that were geared to the children as the audience rather than the teacher. Whilst the teachers were eager to use Web sites designed for children, they specified that they would like teacher resources to help them facilitate usage as a class. Instructionally, teachers felt it important that they introduce themes and demonstrate how to use the Web site as a class, rather than allow students immediate free access to the site.

3.2.8 Hecht Museum

*Hecht Museum: Evaluation of online materials used in galleries, and how they could become more attractive to school audiences, carried out in 2012-13.*


Whereas individual visitors are enthusiastic about using the mobile guide, a typical school group does not consider the guide an integral part of their visit. We posit, however, that the mobile guide has the potential to engage and support learning for the school children in a similar way that it does for adults who find it compelling during their museum visit. They designed the mobile guides to adapt to needs of school students of maritime archaeology, HE students of Art History and elderly people. They observed and adjusted according to their responses. School students did become engaged by a ‘treasure hunt’ approach and HE students enjoyed the resources when it was adapted to encourage more student-led enquiry into interpretations of paintings.

3.2.9 Evaluating games

*Danny Birchall and Martha Henson, Evaluating games as an interpretive tool with online audiences, 2012*


“In this paper, we have set out the case for the importance of evaluation for museum games, particularly those that seek to achieve engagement with museum content. Our understanding of good evaluation is that it is predicated on clearly set and prioritized objectives, measured with a well-defined set of evaluation tools. While formative evaluation is key to ensuring that you produce the game that you want to produce, summative evaluation can tell you much about the success of a game after its launch, including the unexpected and the intriguing.

We have presented a selection of both formative and summative methods. Few projects will have the luxury of incorporating all these into an overall evaluation plan, but we stress the benefits of multi-method evaluation, and in particular combining methods to refine or amplify your understanding, such as follow-on phone interviews from surveys.”
3.2.10 Getty report on teacher use

*Theresa Sotto, Getty report on teacher use of online resources, 2012*


“Teachers perceive their students as positively impacted by Getty lessons and activities in a variety of ways, especially when experiencing a visit to the Museum. The Getty’s teacher resources also help students make connections between art and other disciplines, demonstrating that the arts-integrated strategies in the resources are effective. Due to Getty resources, the majority of teachers believe that their students are: engaged in the content (74.8%); able to connect art to other disciplines, especially demonstrating an increased understanding of history concepts (72.8%); and able to make personal connections to works of art (70%). Getty resources have also positively impacted teachers’ creativity and knowledge of art. More than 64% of respondents agree that using or reviewing Getty lessons has increased their own knowledge of art, and more than half of the respondents agree that using or reviewing Getty lessons has increased their creativity.”

3.2.11 IWM resources

*Martin Bazley, evaluation of IWM online learning resources, 2013.*

Current online learning resources (Their Past Your Future)

- Teachers say there is plenty of impressive content – but some report it is not easy to ‘see the wood for the trees’.
- Useful to have key stage and theme/event browse, but would like to browse by keyword.
- Search results are not always appropriate.
- Want to split up results by topic or type, as so many results to look through is quite daunting.
- As well as teachers, some parents and other non-formal learners visit the Learning pages

Developing new resources:

- Teachers wanted WW1 resources to be distinctive, very creative and interactive otherwise young people wouldn’t be engaged
- Resources need to be visual and clear, useful as stimulus and visual reinforcement
- Content must be short and punchy, and if possible include audio or video
- For A level provide more in depth versions of documents as well.
- Present all material as web pages, but provide printable, editable alternatives.
- Powerpoints are valued as ‘prepped’ materials to use in the classroom (must be editable)
- Provide images in gallery style by topic, each linking to a larger image with more information.

3.2.12 FWW Centenary resources

*Marketlink Insights Ltd, evaluation of FWW Centenary resources, 2013-14*

- There was overall positive response towards the IWM digital learning resources and demand was expressed for a comprehensive source of educational materials for the entire period of the FWW.
• Only half the users were school teachers (48%), most being secondary History teachers.
• More publicity needed so teachers are more aware the IWM is the place to go for FWW content.
• Teachers wanted more enquiry-based content, with more questions.
• They wanted easier signposting so they could quickly see how to use content in lessons.
• Wanted language and content to be suited to children and young people.

### 3.3 Understanding the main interest groups in digital cultural learning

#### 3.3.1 Overview

This section lists the main parties that are interested in developing and partnering in online/digital museum learning. In each category, the types of organisation are listed roughly in order of the centrality of their interest.

Note that in each type of organisation there are several agendas, sometimes in conflict, which will have a bearing on their goals for online or digital learning. For example, in museums, the main tension can be between conservation and learning. In universities it may be between research and education. In schools, it can be between whole-person wellbeing and achievement. In digital agencies, perhaps it is between commerce and social good.

#### 3.3.2 Cultural organisations

<table>
<thead>
<tr>
<th>Different types of cultural organisation</th>
<th>A typical ideal vision includes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Consortia e.g. World Heritage Sites, Festivals or Centenaries</td>
<td>o Creating a virtual world museum: Exposing their collections and content so comprehensively to the web that it can join up gaps in knowledge and recontextualise fragmented or lost heritage. (Curators/museums)</td>
</tr>
<tr>
<td>o National museums</td>
<td>o Creating the ultimate ‘total artwork’ using virtual, multi-sensory and immersive technologies. (Artists)</td>
</tr>
<tr>
<td>o Smaller/regional, independent and university museums</td>
<td>o Serving a mission to disseminate knowledge to increase stewardship of heritage or public participation in science (Institutes or heritage bodies)</td>
</tr>
<tr>
<td>o Heritage sites - natural &amp; cultural heritage</td>
<td></td>
</tr>
<tr>
<td>o Public archives/special library collections</td>
<td></td>
</tr>
<tr>
<td>o University archives/special collections</td>
<td></td>
</tr>
<tr>
<td>o Contemporary visual arts/galleries</td>
<td></td>
</tr>
<tr>
<td>o Science and ideas-based institutions</td>
<td></td>
</tr>
<tr>
<td>o Architecture, place-making and design organisations</td>
<td></td>
</tr>
<tr>
<td>o Ethnic and faith communities</td>
<td></td>
</tr>
<tr>
<td>o Creative companies</td>
<td></td>
</tr>
<tr>
<td>o Theatre, music &amp; dance organisations</td>
<td></td>
</tr>
<tr>
<td>o Literature &amp; literacy organisations</td>
<td></td>
</tr>
<tr>
<td>o Community or socially engaged arts or art therapy</td>
<td></td>
</tr>
</tbody>
</table>
3.3.3 Educational organisations

Different types of Education settings
- Universities
- Education authorities
- Specialist educational associations (subject advocates e.g. NSEAD, NATE)
- Educational charities (e.g. with focus on special needs)
- Schools (especially federations, trusts, independent schools etc)
- Youth sector (agencies, charities, associations e.g. ENYAN)

A typical ideal vision includes:
- Creating a massively open connected system that efficiently delivers knowledge and also starts to generate new knowledge through exponentially increased interactions between people and data.
  (Universities/educators)
- Young people transformed into empowered, entrepreneurial and creative players, accessing knowledge and generating fresh new ideas (learner-focused educators)

3.3.4 Digital organisations

Different types of digital agency
- Commissioning broadcasters e.g. C4/BBC
- Big players that fund & invest e.g. Google, Microsoft
- Web, app & games developers
- Digital education SocEnts & charities (e.g. focus on youth & developing countries)
- Creative skills hubs and co-operatives

A typical ideal vision includes:
- Using the very latest technologies as a base on which to innovate to create an experimental and massively popular product such as a game, app, experience or service tool.
  (Developers)
- Creating content that reaches a mass audience, which has educational value but also generates awards, investment and advertising revenue.
  (Broadcasters)

3.4 Defining terms around digital learning
Digital is often used as an umbrella term for several kinds of product or service. It’s useful to distinguish some terms and notions to avoid too much conflation. This also serves as an update on latest trends.

**BYOD: Bring your own device**

As ownership of mobile devices (smartphones and tablets) has spread to such a large proportion of the population, more museums and schools are basing their digital strategies on providing mobile-friendly digital content. Schools that are embracing mobile learning tend still to encourage purchase of, or provide, standard devices but others, especially from 14 years upwards are finding that the most practical approach is to encourage students’ use of their own devices.

**Computing**

This is the word for newly introduced subject in the new National Curriculum in England. It builds on the formerly named Information & Communications Technology. The intention it has become, in some ways, a harder subject embracing computer science, coding and programming, and computational thinking, rather than ensuring practical experience of some common WYSIWYG tools that students might encounter in the workplace. However, it is extended statutorily to the Primary phase, so that 5 year olds will now need some opportunity to learn coding. It is hoped that the investment of digital companies & Govt interest groups will inject more creativity and guidance into the subject.

**Digitisation**

The conversion of data into digital form e.g. images of collections. Before the internet became dominant, this was the focus of work to make cultural heritage accessible.

**Digital art**

Art using mainly digital tools as a fundamental part of the creative or presentation process. Increasingly, contemporary creativity either has both digital and ‘real world’ elements, or is entirely digital in form. This occupies the concerns of universities, archives, museums and funding bodies because it means a radical shift in commissioning, collecting, funding and training. Where does the work exist and how can it be defined? Culture itself becomes more performative, ephemeral, collaborative, genre-defying and conceptual, and less easily defined by material artefacts and unique creators.

---

6 Requirements for KS1 include:

- understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
Digital interpretation
There may be many other terms for this, but it is used here to encompass the use of digital technologies to enhance the cultural experience, including the museum visit, for the general visitor. Innovations include use of might involve use of responsive kinetic/touch surfaces, or embedding social media into displays, or adding layers accessible through mobile apps. Because of ‘smart’ technologies, there is less clear distinction between museum display and online innovations.

Digital creativity
A term we might use for all the forms of creative making enabled by technologies. It includes using tools for photographing, sound and video recording, editing, web-building and programming, game-making, 3D printing and hacking objects. Digital creativity helps make learning more relevant, visible and motivating, and many digital creative skills are important in school and college curricula, but it isn’t synonymous with Digital Learning/E-Learning. It can be used across the curriculum in schools, but many schools could increase this considerably. It tends to be seen as only relevant to creative and technical subjects. Promoters of the new Computing subject often synonymously use Digital Creativity, perhaps in a wish to emphasise that programming is a creative activity and that there is a wealth of opportunities for hacking your world (e.g. using MakeyMakey and Raspberry Pi).

Digital in schools
NESTA’s Oliver Quinlan has distinguished three areas of digital in schools:
- Computing - Technology as a subject
- The Subjects - Technology within existing disciplines such as Art & Design
- Technology Enhanced Learning - Technology as a tool for teaching learning
This research focuses on the latter, and in particular online learning resources.\(^7\)

E-learning (or eLearning)
A very broad term, used less these days, to encompass the use of any electronic media in learning, including broadcast media, Virtual Learning Environments etc. Increasing sophistication of technologies has enabled innovation in models of learning, so that various settings have developed to be more:
- content rich: having access to an ever increasing, evermore global and evermore interactive repository of rich media and data about any topic
- multimodal - learning through different modes of communication and engagement with the world e.g. visual, moving image, speech & code.
- asynchronous - so that learners can learn at their own pace, in their own time, not tied to a timed lesson.

---

\(^7\) http://www.nesta.org.uk/blog/clarifying-technology-schools-3-ways#sthash.K4zYF5gZ.dpuf

\(^8\) Flow will also publish in April 2015 research for Artswork SE on Extending Digital Practice in cultural organisations and schools, which covers all three areas of technology
- systematic - so that learners can follow a logical and linear path through a procedure, and reinforce and repeat until they have mastered a stage
- personalised - so that learning needs of individuals can be diagnosed, tailored, created and paced to suit them
- collaborative - so that learners can work together on tasks in ways that are not dependent on being in the same space and time.

**Online learning**
This term is synonymous with E-learning but is used more frequently now, particularly in the Cultural sector (as museums, in particular, are more likely to focus on putting content online than creating rich learning opportunities with various electronic technologies).

**Mobile learning**
Or M-Learning. As computing devices are smaller and more portable, schools & learners are shifting from seeing whole classroom models as the leading edge of tech-enabled learning (e.g. Interactive Whiteboards are being replaced by tablets in some schools). Portable devices encourage learning activities to be more physical, outdoors and in multiple contexts. Use of tablets/smartphones offers the possibility to integrate the use of devices for:
- documentation (previously done with cameras/audio recorders)
- creative response and production (previously done with editing tools on static computers)
- sharing learning via social media (previously done more slowly, and via intranets)
- learning via the internet (previously done with whiteboards/static computers)
This means that the distinction between Digital Creativity and Online Learning is broken down.

**Internet of Things**
Computing power embedded in various objects (e.g. in homes, museums, streets) that are connected to the internet. This combines with the availability of wearable and ultramobile connected devices (such as Google Glass). These emerging technologies will affect the cultural visit experience, forcing us to consider ‘Smart Mediation’ as an alternative to online learning. They are also inspiring much of the innovations in practice in the new Computing curriculum. Children are experiencing IoT in games such as Disney Infinity where toy action figures enter the screen when placed on a platform.

**Post-digital**
This reflects an emerging attitude that digital is simply the dominant mode and enabler of all our contemporary tools for engaging with the world. All designs for new products and services should assume that the best tools will be integrated throughout, and these are likely to be digital. Post-digital foregrounds human experience rather than the mechanistic aspects of digital.

### 3.5 Vendor, Partnership and Remote models
3.5.1 Overview

These three terms are relational models in Museum Learning in general, not just in the digital/online sphere. The Stronger Together project explores the implications of a shift from a Vendor model to a Partnership model. In part, the brief for this digital research includes defining how a Partnership model can extend to a Remote model by using digital technologies.

3.5.2 Vendor model

A museum (or charity/business etc.) offers a service in exchange for a fee, and/or to help meet Key Performance Indicators for funders. A museum reviews their assets such as space, collections and expertise, and exploits them to devise products and services that most efficiently meet demand. This corresponds to a Transactional approach to learning.

3.5.3 Partnership model

A museum (or charity etc.) collaborates with its clients or audiences to co-design and co-deliver products and services, and negotiates mutual benefits. They might be commissioned to deliver services (e.g. by a local authority). Partners (e.g. community organisations, subject associations or schools) may sometimes invite their own clients (e.g. young people) to be involved in decisions or giving feedback. This corresponds to the development of a more Transformational approach to learning, and to the idea that when individuals are transformed, there are impacts on organisations and wider communities.

3.5.4 So, what is a Remote model?

There is a negative connotation to the idea of ‘remote’ - it sounds bloodless and unresponsive, and anathema to the materiality and expressiveness of cultural experience.

In the pre- and early-internet days, for the Cultural sector ‘remote’ would have been seen as simply opening up assets for anyone to use independent of place or time, through print or digital online publishing. In this model, the users or clients were assumed to be invisible and there were few means of engaging with dialogue with them, apart from through generic feedback about the digital service. Digital or remote provision of content was often devoid of context. Collection items, which were often already decontextualised by being in a museum (rather than a house, church, grave, forest etc) were denatured further by digital reproduction in a catalogue.

Collections were, optimally, fed into aggregators such as Europeana so that there were more opportunities for recontextualisation alongside collection items from other museums. However, aggregators are still relatively underfed by museums and are not yet used enough by those who have skills at recontextualising disparate collections.
Crucially, what has been lacking in most cultural websites is the application and extension of dialogic and enquiry-based pedagogy that has otherwise grown strong in live museum education practice.

Meanwhile, in museums, the Partnership model is starting to be replaced by or combined with the ‘Participatory’ model, which places even more emphasis on clients from partner organisations, or individuals from the wider public, taking part in co-design and co-delivery. This may mean that there is somewhat less mediation by organisations representing client communities, and more generic and inclusive reach to anyone who is motivated to take part. This has been influenced by the emergence of the Digital realm with its Crowdsourcing and user-driven Service Design.

It is assumed that we should envisage the Remote model as a positive and innovative force, so it may need to be defined in more idealistic terms. Such a definition would need to be open enough to allow a whole range of approaches to emerge.

3.5.5 Good practice in a Remote model

A more positive definition of Remote museum learning might include the following:

**Freeing content from the owning and creating institution:**
Making media content and collections available to be aggregated into other datasets. Where possible, to make them available at high res and without copyright fees or watermarks etc so that they can be exported and used in other platforms and presentation tools, allowing educators, learners, researchers and content producers the freedom to design learning materials to suit them.

*The main party that might be interested in this is content producers (e.g. digital or educational companies) as it allows them to do business without hurdles, and to experiment freely.*

**Make cultural and heritage experiences available to virtual visitors:**
Using a range of technologies to enable people to experience events, places or objects without travelling. This might include:
- visual conversational tools such as Skype/Hangouts/FaceTime
- 3D and panoramic representations of a place, perhaps layered onto Google maps, or with deeper information such as 3D objects or video/audio hotspots
- cultural facilitators (performers/educators/experts etc) going out into community or learning settings with combinations of digital tools and authentic artefacts, which allow them to see into the museum while also handling objects and meeting people.

*The main party that might be interested in this is cultural educators, as it gives them a chance to remain in control and to demonstrate their interpretive innovations, and also to connect with their audiences more intimately.*

**Putting interpretation into the hands and settings of learners outside the walls of the cultural organisation:**
Educational organisations (and individuals/learners) being incentivised, inspired and empowered to create and run their own culturally-enriched content and learning tools. Usually, individual learners would work within a space or process led by either a cultural organisation or educational organisation (or partnership). For example, Re:creative includes exhibition reviews and creative briefs from young people involved in youth groups hosted by five London galleries. There may be fewer well-promoted examples where educational organisations lead the hosting.

The main party that might be interested in this is schools and colleges, and individual learners (e.g. in youth groups).

These factors could point us to a definition of innovation in digital Museum Learning:

- Enquiry-based pedagogy stretched through the technology
- Open data and shareable content
- The cultural experience made as accessible and exciting as possible to remote audiences
- Learners and teachers enabled to lead and develop their own learning pathways.

### 3.6 Digitally-enhanced museum learning pathways

#### 3.6.1 A learning pathway is a story of change

In all our evaluation work and audience research we apply a Theory of Change approach, to understand the most effective agents for change. For this project, we assume that most parties in cultural, educational and digital learning provision are primarily concerned with transforming the attitudes and aptitudes of people (towards increased knowledge, tolerance, stewardship, citizenship, imagination and well being). These parties share a belief that creative and cultural learning can effect these changes, either by focusing on the arts or in combination with academic or technical domains of learning.

#### 3.6.2 Five factors in quality cultural and creative learning

There are perhaps five types of goal in any creative and cultural learning activities:

1. **Playing** for intrinsic outcomes:
   Creative play that is learner-led, open-ended and self-expressive
2. **Learning general skills**:
   Learning that uses creativity to develop transferrable skills (e.g. acquiring life skills or literacy)
3. **Learning about culture**:
   Creative making, enquiry and dialogue in response to artworks, places, stories or topics (e.g. making ‘selfies’ as a way in to understanding a portraiture exhibition)
4. **Practising culture**:
   Learning that focuses on developing high quality virtuosity in an arts or cultural discipline (e.g. becoming a dancer)
5. **Learning through deep participation**:
Active and empowered participation in cultural practice or management of the organisation (e.g. being part of youth advisory and curation group in a gallery)

We used these five elements to help analyse and categorise the digital case studies we discovered. Each one – roughly in the order above - could be seen as appropriate for different phases in a learners’ development as a creative practitioner and cultural citizen. Playing for intrinsic outcomes is foundational, and should continue throughout all the other phases for those to be effective. This could be seen as a pathway through learning at a macro level. All of these aspects can be enhanced by digital resources, perhaps some better than others. Perhaps with current available technologies, the most strongly represented is number 3, Learning about culture.

3.6.3 Schools, Museums and Digital as three agents in the pathway

In this research, we are interested in three key agents to aid this pathway of transformative learning, not just Digital resources, but Schools and Museums as shown in this infographic.
What's at the centre? Arguably it would be core methods of creative and enquiry-based learning, drawing on Ludic and Epistemic play⁹, working in combination with each other.

⁹ A distinction made by Corinne Hutt in 1979. Epistemic play is Exploratory play in which knowledge of things is acquired. Ludic play is play that draws on past experiences and includes symbolic and fantasy play.
In parallel with these twin modes, there is a distinction to be made between:

- E-learning: Accessing epistemic content, networks and experiences through online resources, and
- Digital Creativity: Playing, creating and documenting using digital tools

These are not entirely separate, and shouldn’t be. However, many digital museum offerings either emphasise provision of knowledge (visible online and therefore widely accessible) or creative activities (less visible, published or permanent). Joining and underpinning the two modes is: Communicating to learn and collaborating on projects using digital tools.

3.6.4 The direction of innovation

The diagram below shows how the direction of innovation in digital technology is potentially a force for change in learning. As commercial technologies become more optimised for kinaesthetic activity, more making and more self-expression, there is more potential for digital learning to be more physical and haptic, more ludic and creative.

3.6.5 How learner pathways can be missing from developments in digital culture

In 2013 ACE and NESTA commissioned a report called ‘Digital Culture: How arts and cultural organisations in England use technology’ by Hasan Bakshi. This identified an elite of organisations as ‘cultural digirati’ who are making greater use of a wide range of resources for advice and ideas,
are more open to experimentation, and have digital skills spread throughout their organisation rather than concentrated in any one area. Those using digital technologies well are also those more likely to report reaching a more diverse, younger and more international audience. However, this report, based on a substantial survey sector, failed to ask organisations how digital contributed towards informal learning and formal education outcomes.

This reflects how cultural learning teams have not always been central to the development of a brand’s digital presence, not typically a fault of their own making. Museums have tended to focus on digitising collections and creating virtual museums (and this is curator-led). Increasingly, they are recruiting staff from digital or marketing backgrounds, who develop museum initiatives that are very participatory or playful but without building on educational practice.

In addition, digital engagement led by Learning teams or in education projects takes place offline, or in safe sites, or sites more suited to or owned by young people. This practice may be extraordinary but it can be invisible. As mentioned above, dialogic and enquiry-based pedagogy that is strong in live practice is lacking in visibility in online offerings.

3.6.6 Ideal learner pathways

What kinds of pathways might we see if Museum Learning could be optimally geared to the growth of individual learners, via the enhancement of digital technologies? We might see more learner involvement in and awareness of their own development, and following their own paths of interest. We might see a solid foundation of playful and inventive activity continuing throughout their phases of interaction with culture through digital means. See the infographic below for an ideal learner pathway.
Learning pathways
Enhanced by digital and museums

Unaware
Connect through peers

Other interests
Link to interests
Tech helps personalise. Able to reach content globally to link with interests.

Curious
Intrinsic motivation
Enjoyable experiences. Feeling value in objects/sites. Want to discover.

Hooked in
Museum seen as possibility
Browsing for inspiration, places to go or useful content for projects

Exploring
Connecting

Responding
Connecting with others
Commenting, Questioning, Planning creativity with others.

Participating
Building & sustaining
Joining groups. Bonding over interests. Champions for museums, campaigns, or skillsets. Using tech to build projects.

Creating & sharing
Making meaning
Creating artwork. Following instructions to make new things. Communicating ideas. Setting up experiments. Sharing online.

*for Stronger Together
### 4. Analysis of the digital case studies

#### 4.1 Regional case studies

<table>
<thead>
<tr>
<th>Description including: Audience, Lead sector, Scale and Scope of project.</th>
<th>Presence of innovative features</th>
<th>Predominance of types of learning content</th>
<th>Evidence of interactivity, popularity and sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amersham Museum:</strong> Using Historypin for Metroland exhibition 2013 Volunteers did research with local people &amp; pinned old photos to map, to accompany ‘pop up’ exhibition which schools visited. Schools could use Historypin map &amp; photos as a resource later.</td>
<td>Included to show use of Historypin as tool for museum learning projects. It is open to all to upload photos to the map, so it is <strong>social</strong>. Includes oral history recordings too so is <strong>Transmedia</strong>.</td>
<td>It isn’t targeted at schools but a way of presenting content that schools can use. The more that students are involved in e.g. uploading photos or creating their own stories with the content, the more that learning will result through <strong>Play and Deep Participation</strong>.</td>
<td>If content is shared on third-party platforms that are successful and well-maintained you increase access to and sustainability of digital content. The project itself is a good example of a hybrid community digital storytelling project.</td>
</tr>
<tr>
<td><strong>Lead Sector:</strong> Museum (though Historypin is product of Shift, a social &amp; digital agency)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scale:</strong> Small [<a href="https://www.historypin.org/channels/view/51779#">https://www.historypin.org/channels/view/51779#</a>! photos/list/]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Arbib House:</strong> Sound piece project worked with students from a variety of year groups to record and produce a sound piece based on WWI. Students were recorded in Drama lessons, History lessons and read extracts from diary entries. These were combined with poems, music and sound to create a sound piece that was played in all assemblies.</td>
<td>Includes 3 apps: Pic Collage (use photos taken in museum or imported from its website, create collage); Brushes 3 (used by Hockney, can use to create sketchbook like notes to analyse or mimic paintings); 123D – creates a 3D model of an object</td>
<td><strong>Playful</strong>, open-ended interpretation of works. Digital &amp; communication skills. Somewhat aids understanding cultural context. Promotes deep study within visual art &amp; art history so is <strong>About Culture and a Cultural Good idea to provide resources for BYO devices, so very sustainable. The apps themselves are very interactive. Helen Ward says “The project has generated lots of interest amongst the OAT network (OxfordArtTeach). It</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Lead Sector:</strong> School and arts agency together (a company based in York, Prove2Productions)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ashmolean Museum:</strong> Digital sketchbooks. Using iPads on a museum visit to explore art collections.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lead Sector:</strong> Museum sector in collaboration with a school (Marlborough CoE school)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scale:</strong> Small. Resources encourage groups to bring own devices to museum using particular apps, inspired by work done by small group of students. [<a href="http://www.ashmolean.org/education/dsketchbook">http://www.ashmolean.org/education/dsketchbook</a> s/]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
from several photos of it. Teachers' notes suggest 5 activities for using the apps.

**River & Rowing Museum:**
Use of Skype to follow up visit by Year 7 Biodiversity Science project

**Lead Sector:** School and museum together

**Scale:** Small

Use of Skype as simple free video-conferencing tool

Learning involved real experience of pond dipping & museum learning, followed up by more activity at school, then responded to by the museum.

**Pitt-Rivers Museum:**
Interactive PDF about Great Haida Box Project, with videos/podcasts embedded

**Lead Sector:** Museum
http://www.prm.ox.ac.uk/haidabox.html

Embedding interactive content into a PDF.

Project noted because it gained traction when a Chief Examiner placed link on her website.

**The Story Museum**
Digital Storymaker in residence and Down the Rabbit Hole Digital Hack
http://www.storymuseum.org.uk/whats-on/digital-hack-rabbit-hole/
Part of Artwork SE’s Extending Innovative Digital practice project.

Unusual role of digital storytaker in residence. Supporting development of a Games-making club, where children are designing both digital and analogue games for the museum. Running a Digital Hack inviting teams to create digital games.

The focus on games is Playful. The digital storytaker’s work explores stories and creative literacy so it is About Culture. Involving children in designing games for the museum encourages Deep Participation.

Developmental work with schools struggled because schools were changing management and one in special measures. The most successful activities have been informal learning – summer courses etc.

### 4.2 National Case Studies

<table>
<thead>
<tr>
<th>Description including: Audience, Lead sector, Scale and Scope of project.</th>
<th>Presence of innovative features</th>
<th>Predominance of types of learning content</th>
<th>Evidence of interactivity, popularity and sustainability</th>
</tr>
</thead>
</table>
| **Northampton Inspire.**
An exploratory technology and art teachers’ network group. We hope to work with you to promote an inter-disciplinary approach to the primary curriculum by combining technology and art techniques in creative and responsive ways. | Open content: Yes, videos etc. are overtly described as an OER. Doesn’t create a remote experience of any particular place but | There are multiple learning projects and model classroom activities that cover the full | It’s a very successful learning network. 46 case studies uploaded, with lots of vibrant content. Teachers are commenting |
**http://mypad.northampton.ac.uk/inspire/**

**Lead Sector: Education.** University of Northampton working with teachers on STEM to STEAM project. Their projects make use of museums, galleries & other arts orgs

**Scale:** Small. But has ambitions to spread innovative digital practice beyond its region.

---

**Gamar:**

Learn and fun at museums using Augmented Reality. The first games are for British Museum, National Maritime Museum, Cutty Sark, Royal Collection. Free download with in-app purchases £2.49 per venue. More will be added.

**Lead Sector: Digital, commercial.** Gamar is an enterprise focused on creating children’s apps for London’s attractions. Uses characters & ideas that fit with the museums’ learning offer.

**Scale: Medium-Large.** Commercial model. Team of 12 people in collaboration with Royal Museums Greenwich.

---

**Connecting Collections**

Aims to use the Culture Grid ([www.culturegrid.org.uk](http://www.culturegrid.org.uk)) as an underlying database to capture content which is then improved and augmented to provide learning resources. Focuses on addressing CYP, creating videos that voice CYP’s views about collections, and links to the Arts Award framework. More information at [http://weareculture24.org.uk/projects/connecting-collections/](http://weareculture24.org.uk/projects/connecting-collections/).

**Lead sector: Museum** but no museums, only independents (2 companies, one charity). Culture24 are leading with support from the Collections Trust

---

**About Culture.** Possibly also about a range of Cultural Disciplines. More *Playful* than MyLearning & 100 Objects as it has youth-led video. Strategic resource that combines learning

---

**Very strategic and potentially fairly sustainable. Not launched yet so unable to judge its quality or popularity.**
and Culture Street

**Scale: Large.** Builds on large-scale project Culture Grid. Aims to serve multiple locations, collections & topics. Resources from many sources. However, it increases agency of learners & teachers to explore topics & content of their own interests.

<table>
<thead>
<tr>
<th>My Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>A huge online learning resource created specifically by the cultural sector, mainly museums and heritage sites. It aggregates and re-presents learning resources from other museums. Very curriculum-linked and teacher-orientated. Mostly from across Yorkshire &amp; NW, but it is now national. <a href="http://www.mylearning.org/">http://www.mylearning.org/</a></td>
</tr>
<tr>
<td><strong>Lead sector:</strong> Museums but not by museums. It was originally a Renaissance initiative but is now managed by Leeds Museums &amp; Galleries. The team who run it have a teacher panel that reviews resources before they’re published.</td>
</tr>
<tr>
<td><strong>Scale: Large.</strong> 234 contributing organisations</td>
</tr>
<tr>
<td>A good robust website, adapted over 8 years. Not technically highly innovative. Underpinned with good specifications &amp; thinking on digital rights.</td>
</tr>
<tr>
<td><strong>About Culture.</strong> Adds value as they can collect detailed usage stats, respond to curriculum changes in the way they curate and market it, and can create resources for museums that don’t have the capacity or skills to do it themselves.</td>
</tr>
<tr>
<td>It recently reached a million unique visits over 12 months.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teaching History with 100 objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspired by the British Museum’s successful A History of the World in 100 Objects, teaching resources that focus on 100 objects for History curriculum. <a href="http://teachinghistory100.org/">http://teachinghistory100.org/</a></td>
</tr>
<tr>
<td><strong>Lead sector:</strong> Museums, British Museum in partnership with museums around UK. Funded by DfE</td>
</tr>
<tr>
<td><strong>Scale: Medium.</strong> Fairly simple in concept &amp; content, but with wide national reach.</td>
</tr>
<tr>
<td>Simple robust website. Search features, thumbnail images, and notes to prompt discussion and activity. Nice feature called ‘Bigger Picture’ explains themes and other objects linked to the focus object.</td>
</tr>
<tr>
<td>Requires teachers to read, select &amp; plan their own teaching. Ideas are not very playful. Very much ‘About Culture’.</td>
</tr>
<tr>
<td>Unsure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tate Worlds in Minecraft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tate Worlds are exciting Minecraft ‘maps’ that present virtual environments inspired by artworks from Tate’s collection. The maps allow players of Minecraft to explore a range of paintings and sculpture, undertaking various activities and challenges that relate to the themes of the artworks, or exploring how they were made.</td>
</tr>
<tr>
<td>Allows a Remote Experience of artworks by creating a 3D metaphorical version of them in Minecraft. Minecraft is an Open, User-led environment.</td>
</tr>
<tr>
<td>Players play the game by exploring the already created maps within Minecraft, which may then inspire them to create their own. It</td>
</tr>
<tr>
<td>Assume this was a free/cheap/voluntary project. Had lots of publicity. Popularity of Minecraft suggests it will have longevity.</td>
</tr>
<tr>
<td>Lead Sector: <strong>Museums</strong> (Tate-led) with 5/6 ‘mapmakers’</td>
</tr>
<tr>
<td>Scale: <strong>Small</strong> but ambitious</td>
</tr>
</tbody>
</table>

**EPIK Minecraft Arts award Toolkit**

Guide to achieving Arts Award with activities using Minecraft, including cultural activities such as recreating historical monuments or events [https://epik.makes.org/thimble/MTQ2NTM4NzUy/discover-digital-arts-award-teaching-kit](https://epik.makes.org/thimble/MTQ2NTM4NzUy/discover-digital-arts-award-teaching-kit)

**Lead Sector:** Partnership: Created by **digital agency** EPIK as part of project led by ACE bridge organisation **Artworks SE** with Turner Contemporary

**Scale:** **Small**

| **Open and User-led.** | Encourages use of Minecraft to be creative and to learn about cultural topics. **Learning About Culture** through **Play**, but also develops **General Skills** (especially **Digital**) through **Deep Participation** |
| Resource will be distributed as part of a toolkit to cultural & education sectors. Doesn’t need sustaining now created. |

**Digital Narratives initiative**


Hampshire & Solent Museums Alliance joined forces on a strategy to improve digital storytelling & engagement, with training workshops & guidance on using social media. This link is an account by National Motor Museum at Beaulieu on how they applied their learning to a project about Camping and Caravanning.

**Lead Sector:** **Museums** with support bought in from digital culture experts

**Scale:** **Medium**

| **Approach uses third-party social apps and the approach to digital storytelling is contemporary.** | **Is not primarily a learning project, but provides content that is useful for learners of all ages** |
| The digital strategy is sensible and sustainable |

**Historic Royal Palaces,**

**Explorer missions.** One of four pillars of Learning programme, inspiring CYP 0-19 years to use both online resources & tablet-based apps to explore the Palaces from home and at the sites. A key Explorers offer is **Time Explorers** [http://timeexplorers.hrp.org.uk/teachers](http://timeexplorers.hrp.org.uk/teachers)

Multimedia/web channel serves and underpins this programme. See [http://www.hrp.org.uk/PalaceKids](http://www.hrp.org.uk/PalaceKids)

**Lead Sector:** **Museums** - Led by the museum/heritage organisation HRP

| Using tablets for mobile exploration of palaces. Lots of choice & freedom to add your own narrative. Well differentiated for range of ages. | Time Explorers are themed challenges, kicked off by videos of costumed characters needing help. Children visit a palace to solve puzzles, explore & share their work on a digital ‘passport’. This is very **playful,** |
| Has been developed over a 4 year R&D period, and will continue to evolve. Very interactive. Hard to tell how popular (but Flow evaluated the pilot phase and it was well received by schools) |

---

**Flow UK**

**Digital strand Stronger Together**

**March 2015**
### 4.3 International Examples

<table>
<thead>
<tr>
<th>Description including: Audience, Lead sector, Scale and Scope of project.</th>
<th>Presence of innovative features</th>
<th>Predominance of types of learning content</th>
<th>Evidence of interactivity, popularity and sustainability</th>
</tr>
</thead>
</table>
| **MOMA**  
Art & Inquiry course on Coursera, provides strategies for teaching art in the classroom. Sits alongside another course on Art & Activity. For teachers.  
[https://www.coursera.org/moma](https://www.coursera.org/moma)  
**Lead Sector:** Museum sector (Museum of Modern Art NY) in partnership with Coursera, an education platform company  
**Scale:** Medium because has mass international reach, requires high standard of content for accreditation. Not Large because MOMA has only produced two courses so far. | **Open content:** Less good on this. As a MOOC, you can only access content if you register. You receive links to content in a semi-synchronous way. The content is not openly & continually shared, so as to create a distinctive environment.  
**Remote experience:** Very good. Videos of art & teaching in galleries mean you don’t have to attend CPD in situ. Not strong on User-led as it is instructional teaching led by an expert. It uses multimedia (video, text etc) but not Transmedia as it’s solely online. | The content primarily promotes learning about culture (about artworks). But it also develops general skills of teaching about and with art. It is quite strong on Deep Participation as it encourages peer-to-peer learning through discussion forums & tasks, and lets you see into the workings of an art museum. | 17k participants and 1500 got cert of completion. Coursera told them that people were watching videos til the end, more than any other course. 60% were teachers. Has had 726,000 shares on Facebook. MOMA also has a Facebook teacher’s network with nearly 2,000 members. (Edinburgh Uni ran a MOOC on digital culture with 100k registered.) |
| **ArtLab iPad app from MOMA**  
[http://www.moma.org/explore/mobile/artlabapp](http://www.moma.org/explore/mobile/artlabapp)  
Make a sound composition, a shape poem, a group drawing, etc then save and share your artwork. Explore how artists use line, shape, and colour, discover artists' processes and inspirations, and | **It offers Remote experience** e.g. compelling longer term exploration beyond a visit.  
**Other:** Makes good varied use of iPad-style digital art tools. Sharing can only be | Has c.10 activities plus prompts for more of your own. Strong on play and learning About Culture through creativity. Not all | See review site (link under description) |
<table>
<thead>
<tr>
<th><strong>MoMA Art Lab</strong></th>
<th><strong>Rijksmuseum Studio</strong></th>
<th><strong>Khan Academy</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Create your own artwork inspired by MoMA’s collection (work by Matisse, Calder etc)</td>
<td>High res digital collection images can be gathered by users into galleries, downloaded and used in their own designs, which can be uploaded to the gallery, submitted for a cash prize and sold through their Etsy shop</td>
<td>In partnership with many museums including BM, Tate, Asian Art museum &amp; many others</td>
</tr>
<tr>
<td><a href="http://www.moma.org/explore/mobile/faq">http://www.moma.org/explore/mobile/faq</a></td>
<td>It is very open and user-led. Other: The idea itself is innovative</td>
<td><a href="https://www.khanacademy.org/">https://www.khanacademy.org/</a></td>
</tr>
<tr>
<td>Gets 4 out of 5 stars on this review site <a href="https://www.commonsensemedia.org/app-reviews/moma-art-lab">https://www.commonsensemedia.org/app-reviews/moma-art-lab</a></td>
<td>Not targeted at educational audiences, but of great value to secondary to HE students in creative subjects. Disseminates public learning About Culture, through a Playful and creative approach. Designers submitting for prizes are involved in Deep Participation.</td>
<td>Lead Sector: Khan Academy (both Digital and Education sector). KA creates tutorials using museum content, with their agreement.</td>
</tr>
<tr>
<td><strong>Lead Sector:</strong> Museums Seems to be led by MOMA</td>
<td><strong>Lead Sector:</strong> Led by museum</td>
<td><strong>Scale:</strong> Large scale (one museum, but very ambitious)</td>
</tr>
<tr>
<td><strong>Scale:</strong> Large scale as it’s rich with content and likely to have large distribution</td>
<td><strong>Scale:</strong> Medium (one museum, but very ambitious)</td>
<td>Has thousands of videos and growing number of museum partners, with mass international reach. Google has put $2 million into it.</td>
</tr>
<tr>
<td>Turned on by adults. Has audio for pre-readers. Made available by being on the App store. The inspiration artworks/artists are quite well chosen to suit the qualities of art that can be made in iPad art software. Good user support, and assume that the mobile content will be used on gallery visits</td>
<td>Award-winning and popular</td>
<td></td>
</tr>
<tr>
<td>The art activities are formulaic, many are open-ended. Not really learning about a particular discipline – it’s more like a structured portal to museum content alongside other kinds of learning content.</td>
<td>Mostly learning About Culture. Learning style is not very playful or active, mostly reading or watching videos. The digital badges encourage progress but not necessarily deep participation in a cultural discipline or organisation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult to know how much it is used. Likely to be massively more than museum’s own websites but KA is best used for maths/physics. It’s completely free. Its videos have been translated into 65 languages so has near-universal reach.</td>
</tr>
</tbody>
</table>
especially videos. However, the user doesn’t experience it as Transmedia as content is fed it into platform where young learners are motivated to progress. Uses digital badges. Encourages learners to create their own programs & spin-off projects with their learning.

**Hive Learning Networks**

[http://hivelearningnetworks.org/about/](http://hivelearningnetworks.org/about/)

Hives are comprised of organizations (libraries, museums, schools) and individuals (educators, designers etc). Together, they create opportunities for youth to learn in & out of classroom experiences, design innovative practices and contribute to their own professional development.

e.g. MozFest at Ravensbourne [http://2014.mozillafestival.org/proposals/](http://2014.mozillafestival.org/proposals/)

**Lead Sector:** Collaborative Led by digital (Mozilla) and funded by Other (MacArthur Foundation)

**Scale:** Large international network. Content provided (e.g. Hive Cookbook) is relatively medium-scale.

Mozilla is known for being open, keen to share and develop. Very [user-led](http://2014.mozillafestival.org/proposals/) as these are basic tools for user-led activities.

Learning is through [Deep participation](http://2014.mozillafestival.org/proposals/) and Play but it’s not About Culture in the discipline of traditional arts. Using these tools would develop discipline in Computing. Basing a Hive in a museum would enable link with cultural learning.

Hives don’t yet exist in Europe. However, Mozilla runs lots of education events in UK Potential to be very sustainable. Very interactive.

**Google Cultural Institute**

Tools for museums to upload digital collections (usually highlights) and create themed galleries. Public can create their own galleries from the entire collection. Has also added Google Open Gallery so museums etc can create their own separate online space with video etc. [https://www.google.com/opengallery/](https://www.google.com/opengallery/)

**Lead Sector:** Led by digital/commercial. But museums can now create their own in Google Open Gallery.

Innovative by enabling aggregation of cultural collections. Includes images from Streetview of cultural monuments/sights, and includes video etc. so is fairly [Transmedia](http://2014.mozillafestival.org/proposals/). Includes an Open Gallery now, so is increasingly [open and user led](http://2014.mozillafestival.org/proposals/). Very high quality images & design, integrated with social media.

Isn’t overtly a learning resource but is a useful tool for learning as you can create galleries from the collection, and set up your own gallery in Open Gallery. Supports learning About Culture.