Historic England

Pye Tait Consulting

Virtual College

eLearning and Heritage:
Challenges and Opportunities

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Glossary

ArcGIS StoryMaps	ArcGIS StoryMaps is a story authoring web-based application that enables users to share maps in the context of narrative text and other multimedia content. Stories can include maps, narrative text, lists, images, videos, embedded items, and other media.
Augmented Reality (AR)	AR is an enhanced version of the real physical world that is achieved through the use of digital visual elements, sound, or other sensory stimuli delivered via technology.
eLearning	eLearning refers to learning experiences which are delivered, either wholly or partly, using online or electronic resources, usually using the internet.
Google cardboard	Google Cardboard is an inexpensive handheld device that powers a virtual reality (VR) experience using almost any smartphone running Cardboard-enabled apps.
Learning management system (LMS)	A learning management system is a software application that provides the framework for handling all aspects of a learning process, including housing, delivering and tracking training content.
Massive Online Open Courses (MOOCs)	MOOCs are free online courses available for anyone to enrol on. They provide an affordable and flexible way to learn new skills, advance in a career and deliver quality educational experiences at scale.
Matterport	Matterport is an online platform for 3D space capture and collaboration.
Padlet	Padlet is a digital tool that can help teachers and students in class and beyond by offering a single place for a notice board.
Portable X-ray fluorescence analysers (PXRF)	PXRF represent a category of hand-held instrumentation that are capable of in-situ simultaneous multielement analysis outside the confines of a laboratory.
Shareable Content Object Reference Model (SCORM)	SCORM is a collection of standards and specifications for web-based electronic educational technology. It defines communications between client-side content and a host system, which is commonly supported by a learning management system.
Virtual learning environment (VLE)	A virtual learning environment is an online platform for digital aspects of courses of study, usually within educational institutions. It typically contains resources, activities and interactions within a course structure and may also offer some form of online assessment.
Virtual Reality (VR)	Virtual reality (VR) refers to a computer-generated simulation in which a person can interact within an artificial three-dimensional environment using electronic devices, such as a headset or gloves fitted with sensors. In this simulated artificial environment, the user is able to have a realistic-feeling experience.

1. Introduction

1.1. Importance of skills-based training in the heritage sector

The heritage sector is wide-ranging, encompassing organisations, groups and individuals working with a common aim to conserve, preserve, investigate and repair heritage assets. This cuts across local government (for example planning, archaeology and conservation departments); private sector professional occupations and specialist trades working in relation to the built and natural environment (such as surveyors, museum curators, carpenters, joiners and stonemasons); as well as voluntary and community organisations and groups.

Heritage training and guidance programmes play a crucial role in strengthening the heritage sector and acting as a catalyst to support heritage activity in other sectors such as construction, the natural environment and the arts and cultural sectors.

Historic England's Training Strategy 2018-21[1] makes clear that the sector faces unprecedented social and economic challenges, resulting in the loss of key personnel, knowledge and skills. Without skilled heritage practitioners, decision-makers who understand the public benefits of managing change appropriately, as well as competent craftspeople to conserve and repair, the historic environment faces the significant threat of deterioration and ultimately loss.

The heritage sector also needs support in adapting to change brought about through planning policy and socio-economic trends. Much of the heritage workforce is still primarily drawn from a particular demographic and there is a real business risk that talent is unable to access heritage training or is not represented in the sector. More widely, the sector is experiencing new challenges such as pressures for affordable housing and major infrastructure development.

As the Government's Adviser on heritage, Historic England has a role in supporting the heritage sector and utilising its expertise to deliver and signpost advice, guidance and training. A key aim of Historic England's Corporate Plan 2018-21[2] is to strengthen national capacity and resilience of the heritage sector'. The concept of resilience underpins the ability to understand, protect and manage the historic environment by a workforce that can adapt to changing needs. Stemming from this, Historic England's own training offer contributes to developing the sector's knowledge and skills to ensure heritage is protected and appropriately managed.

1.2. Impact of COVID-19 on the heritage sector and how it trains

Growth and interest arising from a necessity to move learners, heritage organisations and training providers into the world of digital learning has been building for a number of years. This has been made more urgent by the COVID-19 pandemic, successive national lockdowns and suspension of normal life which were first implemented in the UK from March 2020. Many heritage organisations

[1] Historic England Training Strategy – Our Support for Sector Workforce Development 2018-21
[2] Historic England Corporate Plan 2018-21

were forced to cease operations by closing buildings, offices, parks, gardens and other sites, or by stopping, at least temporarily, planned archaeological, conservation, construction or maintenance work.

These restrictions – including on education and training – have had a knock-on impact on businesses in the heritage ecosystem and put jobs, businesses and heritage assets at risk. Organisations have had to adapt quickly to new homeworking patterns to allow staff to balance childcare and other responsibilities with work. For many, online meetings, training and even conferences have allowed projects to continue or have even opened up new possibilities for the future.[3]

In the wake of COVID-19, the need and appetite for the heritage sector to adopt digital technology has therefore increased exponentially. However, it is not a straightforward process, with the myriad of sources/ways forward and considerations. The pandemic has forced a great deal of education and training into a more virtual and digital delivery structure, with less face-to face contact between tutors and learners. While organisations are now recognising it as very much relevant, it can still be a daunting prospect that is perceived as time-consuming and costly.

For the heritage sector, there are clear challenges and opportunities in the use of eLearning to deliver heritage skills-based training, which are examined in detail within this report. As a starting point in understanding the sector's learning preferences, Historic England's Training Needs Analysis 2020/2021 – based on 328 surveyed heritage organisations – revealed a strong preference for combined online and face-to-face training (71% of respondents) followed by face-to-face only (20%), online only (6%) and other/don't know (4%).[4]

1.3. Research aims and objectives

In December 2020, Historic England commissioned Pye Tait Consulting and Virtual College to research the use, opportunities and barriers associated with eLearning for skills-based training in the heritage sector. This was with a view to: evidencing where and how eLearning adds value in a heritage context; showcasing good practice to enhance supply and take-up of eLearning; demonstrating how skills-based training – especially through eLearning – can contribute to post-COVID recovery and sector resilience; and helping Historic England further develop its own training programme for online skill-based training in heritage.

The specific objectives of the research were to:

- Identify good eLearning practice beyond the heritage sector and suggest how this can be applied to a heritage skills-based training context;
- Assess the benefits and challenges of teaching and learning heritage skills online;

[3] Guest, K (2020) 'Heritage and the Pandemic: An Early Response to the Restrictions of COVID-19 by the Heritage Sector in England' in *The Historic Environment: Policy & Practice*
[4] Historic England (2021) Training Needs Analysis 2021/2021

- Assess the accessibility of eLearning and demonstrate how accessibility can be embedded in eLearning in a skills-based heritage training context;
- Demonstrate how heritage organisations can develop new models for the delivery of blended and online skills-based training;
- Assess the capacity of the sector to deliver eLearning; and
- Make recommendations for how heritage organisations can measure the impact of their online training.

Key definitions:

- **eLearning** refers to learning experiences which are delivered, either wholly or partly, using online or electronic resources, usually using the internet;
- **skills-based training** refers to training that is designed to encourage learners to develop certain occupation-specific skills.

1.4. Methodology

The main stages of the research (carried out between December 2020 and March 2021) involved:

- **A literature review** – establishing existing evidence and insights;
- **In-depth interviews** with 15 heritage sector stakeholders representing archaeology (4), conservation (4), construction and the built environment (2), museums/industrial heritage (1), town planning (1), heritage crafts/intangible heritage (1), rural business (1) and heritage science (1);
- **Two virtual workshops** with a total of 12 heritage organisations (mainly commercial businesses) spanning a range of heritage specialisms;
- **Two virtual workshops** with a total of 17 education and training providers operating in the heritage sphere;
- **Development of six case studies** showcasing good eLearning models among heritage organisations and education providers; and
- **A virtual discovery workshop between** Historic England, Pye Tait Consulting and Virtual College to reflect on the evidence, its implications and to shape thinking for the recommendations.

2. eLearning practice

This chapter examines good practice approaches to eLearning both within the heritage sector, as well as potentially transferrable practices from other sectors, including education, construction, health and care, and forestry.

2.1. eLearning practice in the heritage sector

The heritage sector has a strong track record of using digital technologies to promote audience engagement and facilitate meaningful visitor experiences. For the past few decades, regular use has been made of technologies such as digital audio guides, computer-based visitor information systems, visitor-focused multi-media terminals and the creation of virtual exhibitions and spaces online in order to promote enjoyable heritage experiences for visitors.[5] That said, the use of eLearning for skills-based heritage training does not appear to have developed at the same pace.

In spring 2020, the COVID-19 pandemic triggered a rapid drive towards digitalisation in the sector. The closure of many heritage organisations to the public, along with increased home working, has propelled the need to engage heritage audiences and the public through digital channels. This has quickened the need for heritage organisations to understand and effectively exploit digital technologies. The pandemic has created an increasing need both to improve digital skills across the sector and to roll out more skills and knowledge-based training through online and eLearning solutions.

Online training for UK heritage organisations and professionals tends to focus more on building digital skills rather than full suites of technical and practical skills. Examples of digital skills training programmes are as follows:

[5] M. Gruber, (2009) *The role of eLearning in arts and cultural heritage education*

Digital Heritage Lab[6]

The Digital Heritage Lab is a free programme designed for small and medium heritage organisations seeking to develop their digital capabilities and capacity. It is funded by the Digital Skills for Heritage initiative, which was set up in 2019 and funded by the National Lottery Heritage Fund (NLHF) to improve the level of digital skills across the sector.

The Lab comprises a nine-month bespoke online digital skills academy designed to help heritage businesses reach their digital potential and provides each organisation with access to a digital skills expert along with a range of online workshops and online peer network meetings. In addition, the Lab runs numerous online workshops covering topics such as fundraising, digital marketing, digital audience engagement, digital collections management, e-commerce, digital marketing. Between April and May 2020, the Lab ran four free webinars which provided support to heritage institutions during the Coronavirus pandemic. The webinars are now free to watch and cover the following topics: 'eCommerce: getting started', 'digital audience engagement', 'digital access and inclusion' and 'broadening your online engagement.'

Heritage Digital[7]

Another project supported by the NLHF Digital Skills for Heritage Initiative, Heritage Digital offers free digital skills training and support to heritage organisations. This includes a range of free guides and resources focusing on key applications of digital technology for the heritage sector, for example growing and engaging audiences online, developing and publicising digital events and creating digital content, including copyright. Since July 2020, Heritage Digital has also been hosting digital/online workshops focusing on aspects of digital such as digital fundraising, data privacy and online security, using data to grow an audience, digital leadership and choosing the right Customer Relationship Management (CRM) system for heritage organisations.

Applied Arts Scotland – DISTANCE project[8]

The DISTANCE project (Digital Immersive Technologies and Craft Engagement) is seeking to make use of Virtual Reality (VR)[9] technology to allow craftspeople in Scotland to collaborate and share their skills, knowledge and craft products. Working with Soluis Heritage – specialists in developing digital content for the heritage sector – Applied Arts Scotland is exploring ways in which craftspeople in Scotland can use VR headsets to engage themselves and others in their practice.

Many eLearning courses act as an introduction to more traditional hands-on training. For example, the Nautical Archaeological Society's (NAS) eLearning Programme[10] offers learners one year access

[6] https://www.a-m-a.co.uk/digital-heritage-lab/
[7] https://charitydigital.org.uk/heritage-digital
[8] https://www.appliedartsscotland.org.uk/distance-project/
[9] Virtual reality (VR) refers to a computer-generated simulation in which a person can interact within an artificial three-dimensional environment using electronic devices, such as a headset or gloves fitted with sensors. In this simulated artificial environment, the user is able to have a realistic-feeling experience.
[10] https://moodle.nauticalarchaeologysociety.org/

to three courses which cover the essential aspects of maritime and underwater archaeology. It gives learners access to a course tutor for queries as well as NAS membership. The courses allow learners to grasp the basics of maritime archaeology and gives them the grounding they need to carry out practical training at the Society's Skills Days.

Examples from the USA

- There seems to be a strong precedent in USA of using 3D modelling to provide virtual tours of major international archaeological sites. These include the **Digital Roman Forum**[11]**,** developed by the Cultural Virtual Reality Laboratory (CVRLab); **Digital Karnak**[12]**,** run by the University of California; and the **Digital Pompeii**[13] project, developed by t*he University of Arkansas and using the power of the Unity game engine to enable students to recreate sites such as Pompeii as part of a virtual, online lab for art historical research.*

- The **Archaeological Institute of America (AIA)**[14] works with archaeologists, educators, museum staff, and other specialists to create and compile programs and resources for teachers to use in classrooms or at home to explain what archaeology is, what archaeologists do, and how sites are discovered, uncovered, and interpreted. Resources include lesson plans and activities for download.

- The **Smithsonian Learning Lab**[15] is a major rethinking of how digital resources from across its 19 museums, nine major research centres, the National Zoo, and more, can be used together, for learning. The Smithsonian is committed to supporting teachers and their students around the globe as they face unprecedented new learning challenges. On the Learning Lab, teachers have access to millions of digital resources, including lessons, activities, and recommended resources made by Smithsonian museum educators as well as classroom teachers.

Insights from stakeholders and workshop participants

Workshop participants mentioned using the following technologies and resources to support skills-based heritage training:

<u>Heritage organisations:</u>

- Platforms such as MS Teams, Zoom, WorkCast (virtual conference platform) and Matterport (platform for 3D space capture and collaboration, e.g. for virtual tours);
- Online PowerPoint presentations and webinars with embedded audio and video (live and pre-recorded) with some implementation of assessment using PowerPoint presentations;

[11] https://sandbox.idre.ucla.edu/sandbox/digital-roman-forum
[12] https://sandbox.idre.ucla.edu/sandbox/digital-karnak
[13] https://podcasts.apple.com/us/podcast/digital-pompeii-project-immersive-distanceLearning/id1033567167?i=1000351970045
[14] https://www.archaeological.org/programs/educators/education/
[15] https://learninglab.si.edu/

- Virtual classrooms and learning management systems (LMS) such as Moodle[16] to permit self-study and guided learning;
- Live chats;
- Virtual mentoring/coaching sessions;
- Virtual conferences/seminars, including polls, content interactivity and breakout rooms;
- Video recordings of face-to-face meeting/events;
- Surveys aimed at staff and volunteers to explore skills gaps;
- 3D virtual digital tours;
- VR headset experiences;
- Short films; and
- Digital toolkits of downloadable resources.

Education providers:

- Mix of live and pre-recorded lectures;
- Live labs (for artefact examination);
- Virtual field trips and site tours – filmed;
- Massive Open Online Courses (MOOCs)[17];
- Documents/plans/blogs (pre reading); and
- Quizzes.

Several participants– especially museums and other cultural heritage organisations –mentioned using virtual meeting platforms to organise and deliver training to paid staff and volunteers. One organisation had developed a six-week plan of online training for staff and volunteers, funded by the Cultural Heritage Recovery Fund, which included update training on topics such as health and safety and equality and diversity.

The consensus is that most eLearning in heritage appears to consist of knowledge transmission through ad-hoc virtual meetings. One stakeholder was keen to stress the additional value that a collaborative approach to learning could bring, involving peer-to-peer support between learners.

Supporting the findings from Historic England's Training Needs Analysis, several participants emphasised the importance, relevance and value of a blended learning approach in the heritage sector, combining high quality eLearning with face-to-face practical training. This has clear benefits where work needs to be done outdoors and learners need practise where they are exposed to the elements, e.g. historic building repair and conservation. It was also pointed out that there is a limit on how much time a learner can spend in front of a monitor, further emphasising the value of a blended approach.

Other stakeholders and heritage organisations mentioned how advanced technologies such as VR are being used for interpretation purposes and to enrich visitor experiences (e.g. providing virtual

[16] Moodle is a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalised learning environments.
[17] Massive Open Online Courses (MOOCs) are free online courses available for anyone to enrol on. They provide an affordable and flexible way to learn new skills, advance in a career and deliver quality educational experiences at scale.

3D tours of historic sites and museums for visitors). Drone technology was also mentioned as a means of examining landscapes and buildings.

A construction sector stakeholder described how immersive virtual learning can be risk free, waste free and undertaken at reduced cost, especially where raw materials might otherwise be expensive and supervision needed. For example, learners could perform virtual cuts on wood 50 times before going on a real machine; or use cameras on tablets with a programme that can explore an object and superimpose information onto the image. Additionally, Google Cardboard[18] was mentioned as an affordable and low-cost solution for introducing learners to VR experiences.

An archaeology stakeholder felt that there is a lack of short (e.g. two-minute) videos providing bite-size heritage skills training on specific techniques; also that it is vital to think about the audience when developing eLearning and keeping in mind who will benefit, what stage they are at in their career and what the envisaged outcomes are. Another stakeholder from a planning perspective made a similar point, arguing that much depends on learners' age demographic and what they are studying for, such as high stakes exams or non-compulsory CPD, since that might affect the most desirable mode of delivery.

Heritage organisations that have embraced digital technologies for learning used words and phrases such as 'exciting', 'terrifying' being 'brave' and 'quick shift' to describe the opportunities, reinforcing how the COVID-19 pandemic has pushed the sector into a new world where the need for signposting and support is greater than ever.

Many education providers have taken steps to embrace online forms of learning as a result of the pandemic. Several mentioned migrating courses online, for example archaeology and conservation studies, using a mix of live sessions and asynchronous learning; use of guest lecturers (who have proven easier to secure during the pandemic) and peer group collaboration. Several highlighted commercial platforms as being particularly valuable, such as Future Learn from the Open University.

For some educators, low numbers of participants available for face-to-face practical sessions has led to online learning being the only viable alternative and even helped to ensure business survival. Others mentioned the significant challenge in terms of time and effort for planning and implementing these solutions, in some cases from a standing start.

Views are mixed on what the future might hold, with some workshop participants foreseeing a boom in eLearning amid changing times, and others expecting a return to traditional face-to-face methods, especially where this concerns practical skills acquisition.

Case studies

Six case studies developed from stakeholder and workshop participants, offer interesting examples of practice in the use of digital technology to strengthen learning or improve visitor or member

[18] Google Cardboard is an inexpensive handheld device that powers a virtual reality (VR) experience using almost any smartphone running Cardboard-enabled apps: https://arvr.google.com/cardboard/

experiences. The main approaches are introduced below, with more on the benefits and challenges in sections 3 and 4. Complete standalone case studies can be found in Appendix 1.

- Prior to COVID-19, **Durham University** designed two **MOOCs** using the Open University's Future Learn online platform. These archaeological and heritage courses have had over 29,000 virtual participants from more than 147 countries, including many with physical disabilities. The MOOCs have increased access to historical and archaeological findings and supported authors in delivering accurate representations of history.

- For the Archaeology Department at the **University of York**, COVID-19 impeded plans for students to undertake invasive excavations on site. Staff had to consider what the next 12-months of teaching and project activity would look like, resulting in students being given packs of information on the university's **Virtual Learning Environment (VLE)**, providing access to pre-recorded lectures, demo videos, as well as live sessions including the use of hardware like visualisers that helped maintain the practical aspect of teaching. Virtual fieldtrips were introduced, for which students received upfront materials including heritage planning applications and an hour of live teaching to talk through the critical detail. The university embraced Padlet[19] as a collaborative space to encourage conversations between students and staff. Meanwhile, ArcGIS StoryMaps[20] allowed information to be packaged up where a site visit would have been traditionally used.

- To adapt to teaching in the COVID-19 pandemic, the Department of Archaeology at **Durham University** introduced **virtual labs** to bring museum objects to life and encourage students to interact with the past. The artefact studies class was moved online and involved one-to-one lab sessions with each student using photography and analysis from museum objects sourced the previous year. Over Zoom, the tutor used a Dino-lite microscope camera to help students explore the assigned object, encourage them to ask questions and use the tutor as their 'hands'. Students had the opportunity to follow up these sessions by requesting additional analysis such as X-rays, UV photographs or further pXRF analysis[21], which were sent to them via email.

- Since opening in 2019, **David Parr House** in Cambridge had been fully booked for physical tours until the COVID-19 pandemic meant the house had to close. Following funding from Historic England, the team developed a virtual tour for visitors to sustain a revenue stream, continue to give visitors access to the house, and keep volunteers and staff involved throughout the pandemic. Following the tour, visitors can access an online 'Explore' platform for 48 hours where they can unlock 2-3 hours of additional knowledge-based content.

- **VR** technology has enabled visitors to the **Jim Clark Motorsport Museum** to sit in the driver's seat and gain an interactive experience of motorsport. This has also enabled museum staff to

[19] Padlet is a digital tool that can help teachers and students in class and beyond by offering a single place for a notice board.
[20] ArcGIS StoryMaps is a story authoring web-based application that enables users to share maps in the context of narrative text and other multimedia content. Stories can include maps, narrative text, lists, images, videos, embedded items, and other media.
[21] Portable X-ray fluorescence analysers (PXRF) represent a category of hand-held instrumentation that are capable of in-situ simultaneous multielement analysis outside the confines of a laboratory.

embrace digital technology in a curatorial and museum context where the mindset had been perceived as more traditionally 'analogue'.

- Finally and also in response to COVID-19, the **Institute of Conservation (Icon)** has implemented **online assessments** using video technology. Normally to become an accredited member, conservators and restorers would present and discuss evidence with Icon assessors face to face. However, smartphones have proven a useful mechanism to show assessors an object during the assessment process. This change has helped Icon to expand its reach globally.

2.2. eLearning practice in wider sectors

This section examines existing intelligence on e-learning practice within the education, construction, forestry, and health and care sectors, respectively. Additional research would be needed to better understand the different enablers and inhibitors to e-learning within these sectors, such as time commitment, types of devices and software used.

Education sector

The use of digital technologies to deliver learning outcomes in the UK education system has become increasingly commonplace over recent decades. The 2019 EdTech Strategy, *Realising the potential of technology in education,* highlighted the Department for Education's commitment to tackling barriers to effective technology adoption and use, whilst supporting the growth of the EdTech sector in ways to help ensure it can meet the needs of education leaders and teachers. This has accelerated significantly in response to COVID-19 as educational institutions have been forced to close and put in place distance learning measures. However, recent research suggests that there is no single, one-size-fits-all approach which works best overall or works well for all learners.

Research into eLearning experiences in the UK have found that different learners have different preferences for online learning solutions depending on factors such as age and level. According to the 2020 *Digital Experience Insights Survey*, undertaken by Jisc,[22] eLearning preferences of further education (FE) students differed slightly to those in higher education (HE). Whilst HE students tended to favour practise questions available online as a learning aid, students in FE typically favoured a wider range of interactive polls/quizzes in class, course-related videos or online practise questions. Furthermore, FE and HE students were found to learn online in different ways. According to the previous year's survey (2019), although the majority of students from both FE and HE (54%) preferred to learn through a mixture of individual and group work, FE students were keener to learn in groups, while HE students were more likely to choose to learn on their own.[23]

Evidence has shown that the pandemic has encouraged innovative online learning practices which may serve as a model to other sectors. For example, South East Regional College in Northern Ireland has embraced cloud-based technologies and e-conferencing software to convert their entire

[22] Jisc (2020) *Student digital experience insights survey 2020: question by question analysis of findings from students in UK further and higher education*. The research involved a survey of 19,137 FE/sixth form learners and 20,575 HE students.
[23] Jisc (2019) *Digital experience insights survey 2019: findings from students in UK further and higher education*

timetable into a system of remote, online learning for students and teachers. This has involved using tools such as Class Notebooks and Microsoft Teams to enable students to hand work in online and engage with one other from home.[24]

Effective eLearning in education appears to depend heavily on ensuring that meaningful channels of communication – student-tutor and student-student dialogue – are integrated into the online learning activity. This has been evidenced through research carried out in 2015 on a population of 186 students from six American universities, which found that no single approach to online learning could be equated with improved learner engagement or learning outcomes. Rather, the research found approaches which helped to tackle learner isolation and connect learners to their peers and tutors, which helped to improve learner engagement.[25]

Construction sector

CITB's 2017 report *A New Reality: Immersive Learning in Construction,* examines how digital technologies such as VR and Augmented Reality (AR)[26] have the potential for a double benefit to transform both training delivery and the perceptions of the construction sector for young people and investors. That said, major challenges include: addressing fragmented and inconsistent training; ensuring consistent immersive learning; understanding the potential of those who can use it; and encouraging training providers to invest in the technology and recognise how this would aid in reaching educational targets.

Immersive learning – which involves using AR and VR to create simulated learning experiences – has had a profound impact on the nature of training. Immersive learning is particularly useful in training workers on specialist plant and machinery, allowing individuals to be fully involved in an interactive, digital environment, without leaving the classroom.

As identified in the 2017 report, immersive learning in construction can bring the following advantages:

- **Producing 'work-ready' employees,** by allowing learners to develop the practical skills that may not otherwise be available through traditional methods;
- **Better assessments through tracking data:** Immersive technology can allow better assessments of student performance by facilitating the tracking of a learner's progress in the simulation;
- **Cost-effective tools:** Immersive learning helps to reduce the costly expense of training on specialist machinery by allowing learners to practice the skills and competencies required to carry out tasks virtually before moving on to the real equipment. Trainers

[24] The Edge Foundation (2020), *The Impact of Covid-19 on Education*
[25] Dixson (2015) 'Creating Effective Student Engagement in 'Online Courses: What Do Students Find Engaging?', *Journal of the Scholarship of Teaching and Learning*, 10(2), 1-13
[26] Augmented reality (AR) is an enhanced version of the real physical world that is achieved through the use of digital visual elements, sound, or other sensory stimuli delivered via technology.

can also focus their attention on the most specific, high cost or hazardous real world training.[27]

The construction sector also has access to a learner management system known as the Supply Chain Sustainability School.[28] Set up in 2012, the School is a collaboration between clients, contractors and first-tier suppliers. It offers a free membership-based online learning environment for those working in the construction industry, as well as for students looking to join the sector. It focuses on 17 key topics of sustainability, as well as addressing topics in offsite construction, digital, procurement, lean construction and management. Content covers training and networking events, CPD points, self-assessment, bespoke action planning, complete eLearning modules and various other training resources such as Toolbox talks, webinars, videos, web links, presentations, documents etc.

Forestry sector

The Institute of Chartered Foresters may offer a transferrable model for digital continuous professional development (CPD) in a comparable sector with a strong focus on land-based skills.

The Institute responded to the first lockdown in March 2020 by converting much of its CPD training opportunities into online delivery. It made a total of 30 hours' online CPD content available to its members, covering diverse topics such as refresher courses on the Woodland Carbon Code, the implications of DEFRA's ELM scheme for forestry, as well as a range of topics such as plant passports, timber regulation and wild-fire prevention.[29]

The Professional and Educational Standards Committee (PESC) acknowledged that the Institute, and others, had swiftly embraced digital platforms and provided members with a variety of high quality CPD opportunities. The extensive offer – including a mixture of free and paid events available live or recorded – led the PESC to conclude that members' annual CPD requirement did not need to be relaxed.[30]

Health and care sector

The UK health and care sector benefits from a wide range of online courses developed by Health Education England in collaboration with UK medical colleges and other leading professional bodies. These use centralised portals to make the process of locating and accessing training as easy as possible – a potentially transferrable example of good practice for the heritage sector.

e-integrity[31] offers over 40 eLearning programmes covering different aspects of healthcare – from intensive care medicine to compassion in practice – as well as free online resources specifically designed to help healthcare professionals respond to the COVID-19 pandemic. All training opportunities can be found in one place on e-integrity's website. Additionally, Interserve[32] offers a

[27] CITB (2017) *A new Reality: Immersive learning in construction*
[28] https://www.supplychainschool.co.uk/about/what-is-the-school/
[29] Institute of Chartered Foresters (online) *Your CPD Hub*: https://www.charteredforesters.org/2020/07/your-cpd-hub/
[30] Institute of Chartered Foresters (online) *Statement on CPD Obligation*: https://www.charteredforesters.org/2020/06/statement-on-cpd-obligation/
[31] https://www.eintegrity.org/
[32] https://interservehealthcare.com/work-for-us/training/

range of free digital training, available to registered client care staff, which is accessible in one place via its portal.

2.3. Experiential learning approach

Proposed by psychologist David Kolb in 1984, experiential learning refers to a process of learning through experience or 'learning by doing'. According to Kolb, experiential learning can best be described as 'the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming the experience.'[33]

Kolb's model of experiential learning proposes two ways through which learners can 'grasp' experience (concrete experience; abstract conceptualisation) and two ways through which learners 'transform' experience (reflective observation; active experimentation). These four components of the experiential learning process have a cyclical relationship: concrete experience provides information which learners use for reflection. From these reflections, learners can form abstract concepts which they can then use to test their ideas in the real world. By testing out concepts, learners are able to acquire more information through experience.

This type of learning, which involves gathering information through experience and testing out abstract concepts through real-world applications, are particularly useful when learning practical skills (such as learning to drive).[34]

Research has shown that certain online learning practices have the potential to deliver experiential learning. However, eLearning which successfully leads to experiential learning tends to have to be fully immersive and interactive in nature – such as gaming or simulated reality – and the most effective means of ensuring experiential learning is through the pairing of eLearning to face-to-face training.

The Resuscitation Council's Lifesaver (an interactive game designed to teach learners the basics of CPR) is a case in point. Users attempt to resuscitate a victim of cardiac arrest in a filmed sequence by moving their device up and down to simulate chest compressions. Research carried out in 2017 on a controlled group of 81 students – which compared the performance of students trained using Lifesaver against those trained through face-to-face instruction – found that Lifesaver produced comparable learning outcomes for several key elements of CPR. While students who received training through Lifesaver alone performed worse at chest compressions than those who received face-to-face training when assessed immediately after training, the research found that there was no difference in performance when assessed again after three months and then after six months.

While this research clearly shows that eLearning can lead to learning outcomes equal to those achieved through face-to-face training, it concludes that the greatest benefits are to be realised when eLearning is coupled with traditional, instructor-led learning.[35] Experiential learning for

[33] D. A. Kolb(1984) *Experiential Learning: Experience as the Source of Learning and Development*
[34] K. Cherry 'The Experiential Learning Theory of David Kolb' [online] published by *Very Well Mind*
[35] J. Yeung et al., (2017) 'The school Lifesaver study – A randomised controlled trial comparing the impact of Lifesaver only, face-to-face training only, and Lifesaver with face-to-face training on CPR knowledge, skills and attitudes in UK school children' in *Resuscitation*

practical and technical skills is therefore perhaps best achieved through a blended approach utilising both eLearning and face-to-face learning.

The Lifesaver family of products now includes an interactive game for the general public, a workforce training tool that meets the National standard for CPR and AED (Automated External Defibrillator) awareness training, and an innovative VR experience used by young learners and many first-aid trainers across the UK.

3. Benefits of eLearning

The literature, combined with stakeholder and workshop participant feedback, illustrates how eLearning can offer numerous benefits to heritage organisations, education providers and learners. These are explored throughout this chapter, along with how eLearning can help to engage particular groups of individuals and widen access to training in the heritage sector.

3.1. Benefits for heritage organisations

Flexibility

The flexibility of eLearning can give it a distinct advantage over more traditional face-to-face courses, since businesses do not need to surrender their employees for whole days or weeks at a time. It therefore supports a flexible training solution which can fit around workforce schedules and be tailored to different learning styles.

Furthermore, eLearning can be effective for upskilling and refresher training, as well as driving learner participation in training across an entire organisation. Online learning platforms can allow individuals to create a cumulative record of their learning (including course progress and module completion status) and may even be used be used to create a type of flexible 'skills passport' for individuals[36].

Lower cost training

eLearning can reduce training-related costs for employers. Not only can employers save money on trainers, they can also save on associated costs such as travel, venue hire, catering and hard copy course materials, as well as the opportunity cost of an employee being out of the business for days

[36] CBI (2019) *Employers and lifelong learning: the importance of upskilling and training in a modern economy*

or weeks at a time to attend training. To undertake eLearning, employees typically only need access to a computer and can complete the training in the office or at home.[37]

It is important to note that employers may face additional costs associated with eLearning development, access to digital technology, subscription costs for virtual platforms, providing workers with access to electronic devices etc.

Connecting senior managers to the workforce

One stakeholder pointed out that online technology means that directors and other senior officials within an organisation can connect live in front of the workforce or the grassroots membership, e.g. for Q&A sessions.

Insights from workshop participants

Heritage organisations taking part in the workshops mentioned a variety of benefits that eLearning and digital technologies have brought to their organisations. These are summarised below:

- Keeping people staff, volunteers, customers and community groups connected (especially through the pandemic) for example helping to minimise feelings of isolation and increase social contact through video-based meetings;
- Creating interest through a mix of different types of media, e.g. online conferences, formal lectures, presentations, one-to-one training;
- Reaching a wider audience of learners and members of the public, potentially internationally;
- Creating new revenue streams, e.g. 3D tours, new model for consultancy;
- Partnership working opportunities;
- A more cost-effective and environmentally sustainable solution than face-to-face training due to reduced travel and time 'out of the office';
- Increased confidence in technology among leaders, staff and volunteers; and
- Continuity of training, coaching and mentoring during the pandemic when face-to-face opportunities were no longer possible.

Case study messages

The introduction of virtual visitor tours at **David Parr House** in Cambridge has helped to strengthen digital skills. The has yielded positive impact not only for the organisation, but also in a wider social sense, for example some older staff and volunteers have learnt how to connect with family and friends via Zoom. Tours have also expanded to suit specialists, for example paint conservators, and has led to the recruitment of staff to provide additional digital support.

Icon's move to introduce remote assessments in order to accredit restorers and conservators into their membership has been well received by candidates and assessors and has avoided the risk of a backlog that might otherwise have occurred. Furthermore, remote assessment opens up the process

[37] Edgepoint Learning (online) *12 of the Biggest Benefits Of eLearning For Employees*

to restorers and conservators across the globe, with candidates now being assessed in Australia and the USA. Previously, face-to-face assessments were mostly undertaken in the UK so Icon has the potential to really grow its membership.

3.2. Benefits for learners

Improved learning experiences and outcomes

Research has shown that eLearning offers numerous positive outcomes for the learning experience, including making learning more enjoyable, allowing learners to be more flexible and independent in how they learn, and making learning content easier to understand.

Research into user experiences of eLearning tends to report largely positive views of online learning experiences. According to Jisc's 2019 *Digital Insights Survey*, the majority of FE and HE students reported that eLearning:

- made learning experiences more enjoyable (68% of HE and 59% of FE students);
- content was easier to understand (69% HE and 61% FE);
- promoted greater independence in learning (75% HE and 63% FE);
- allowed them to fit their learning into their life more easily (76% HE and 58% FE).[38]

As previously noted as part of the *Lifesaver* case study, students who received training through Lifesaver alone led to similar performance after three and six months compared to those who received face-to-face training.

Whilst this research indicates that eLearning can lead to learning outcomes equal to those achieved through face-to-face training, evidence suggests that the greatest benefits are to be realised when eLearning is coupled with traditional, instructor-led learning.[39] Experiential learning for practical and technical skills is therefore perhaps best achieved through a blended approach utilising both eLearning and face-to-face learning.

Flexibility

eLearning allows learners to undertake training at times that suit them. The flexibility of online learning means that learners can fit learning around work and family commitments, which serves to open up training to those who do not have the time to commit to attending training in more formal (and less flexible) working environments.[40]

[38] Jisc (2019) *Digital experience insights survey 2019: Findings from students in UK further and higher education*
[39] J. Yeung et al., (2017) 'The school Lifesaver study – A randomised controlled trial comparing the impact of Lifesaver only, face-to-face training only, and Lifesaver with face-to-face training on CPR knowledge, skills and attitudes in UK school children' in *Resuscitation*
[40] ICF Consulting (2018) *Review of the online learning and artificial intelligence education market A report for the Department of Education* (DfE)

eLearning can also make better use of available time than offline training, for example a training session on Zoom will typically last only for the duration of the course, whereas face-to-face training requires time to travel, which could easily consume several hours. This means that eLearning can fit more easily around working and (child)care responsibilities and make training more accessible.

Learners can theoretically access and re-access online learning or recorded lectures at any time and from any place provided they have access to a computer/phone and internet connection. Stakeholders pointed out that this is a key benefit for the heritage sector as there are often limited funds to allow staff to travel to conferences and offline workshops etc.

Several stakeholders also mentioned that the COVID-19 national lockdown and wider shift towards online communication and training solutions has enabled staff in heritage to attend more training than would have been the case previously, since staff are not hindered by travel restrictions.

3.3. Benefits for education providers

Maximising course reach

Whilst a face-to-face course may only have a small audience of local interested learners, eLearning allows the provider to extend the reach of training potentially internationally. This can be especially useful for niche specialisms (such as use of certain types of construction materials) where there may be a lack of local training supply.

Greater flexibility and reduced financial risk

eLearning allows training providers to offer a richer array of training events in a more flexible way, including multiple events over the course of a day or during the evening which can in turn attract more sign-ups. eLearning also carries considerably lower financial risk where venue hire costs might otherwise risk some providers losing out if a smaller than expected audience were to materialise. Additionally, eLearning provides increased opportunities to access insights and data to help evaluate the success and impact of training.

Insights from workshop participants

Educators taking part in the workshops mentioned the following benefits experienced from involvement in eLearning:

- Broadening the reach of training to new audiences, including new international markets;
- Better economies of scale around training delivery;
- More democratic platform through being able to invite people to talk and deliver different types of sessions;
- More tech savvy local societies being better equipped to implement lecture series online, which could rival those of universities in terms of quality; and
- New and enriched connections and dialogue between educators within the UK and internationally;

- As a result of the above, greater enrichment of trainers' own knowledge and skills through increased interactions with a more diverse audience.

Case study messages

- The development and hosting of MOOCs at **Durham University** (using the Open University's FutureLearn platform) has helped to better support practitioners across the globe and break down barriers to taking part. It has also enabled several authors to accurately represent history and archaeology in their novels;

- The introduction of virtual archaeology fieldtrips at the **University of York** has allowed students to collaborate upfront and frame discussions in a productive way, especially through the use of Padlet software. Based on students' assessments, there is evidence that they are thinking about things in a much more critical way and gaining a broader range of experiences, for example with more focus on aspects such as data processing, interpretation, and communication.

3.4. Widening access to training through eLearning

Adult learners

eLearning can be particularly effective at making training more accessible to adult learners, including those who are already active in the labour market. According to the Department for Education's 2018 *Review of the online learning and artificial intelligence education market*,[41] online learning resources are especially useful at engaging adult learners with work or caring responsibilities who may have limited time to dedicate to classroom learning. The main reason is that online learning allows individuals to progress at their own pace and at a time convenient to them.

The review, which drew upon data obtained from interviews with 42 online learning developers and providers, found accessibility to be a key area of strength of eLearning, allowing adult learners to fit training around their schedules. The review also found that the low cost of online learning courses compared to classroom-based courses, further encouraged accessibility, and that the widespread availability of free provision encouraged learners to 'try out' online learning.

Individuals with learning disabilities

DfE research[42] found that computer-based learning can be highly conducive to engaging those with learning difficulties. In doing so, it allows these learners to use specialist adaptive equipment and software and enabling mobility-impaired learners to access training without the need to travel.

[41] ICF Consulting (2018) *Review of the online learning and artificial intelligence education market A report for the Department of Education* (DfE)
[42] ICF Consulting (2018) *Review of the online learning and artificial intelligence education market A report for the Department of Education* (DfE)

eLearning also offers individuals with learning difficulties a more flexible and accommodating learning environment, for example it gives these learners the option to review materials or watch videos as often as they need and to progress at a pace they feel comfortable with. Furthermore, digital software enables students such as those with dyslexia or visual processing disorders to manipulate digital text by changing the font style or size. Online courses are typically developed to Universal Designed Learning (UDL) standards, which enables information to be displayed in different ways to accommodate different learning needs. All such characteristics offer benefits which cannot be achieved so easily through classroom-based learning.[43]

Research has typically shown that eLearning promotes greater inclusivity in training for students with learning disabilities. According to the results of a five-year research project which examined the effects of online training on a diverse selection of students in the second year of a Bachelor of Education degree,[44] the process of undertaking a course online brought numerous benefits for students with learning disabilities. These students demonstrated greater levels of self-directed learning and interaction in discussion groups when undertaking compared to offline students, as well as higher satisfaction levels. Students with learning difficulties also performed better overall in the online course compared to other students; moreover students with learning disabilities achieved a higher average grade through online courses compared with other cohorts of students.

However, to truly understand the suitability of eLearning for individuals with disabilities, there needs to be further research into the impact of eLearning on people with different types of impairments, as well as first-hand learner accounts. More recent research has suggested that online learning may in fact create barriers for people with certain disabilities, for instance, social elements of online learning can act as a barrier to participation.[45]

Insights from stakeholders and workshop participants

Most participants see great potential for eLearning in widening access to training in the heritage sector. However, some caveat this by pointing out that eLearning may be most effective in widening training participation among those who are already actively involved in the sector, rather than it being a tool to attract new people into heritage.

Stakeholders argued that the following individuals might stand to benefit most from eLearning, including:

- Those who are highly digitally literate, including younger members of the workforce, recent graduates and those who use digital resources/technology regularly in their life and work;
- Office-based heritage professionals such as those working in local government, who might find it easier and more convenient to fit eLearning into their schedules than those working 'in the field'; and

[43] J. Barden (2017) '5 Benefits Of eLearning For Disabled Students', *eLearning Industry*

[44] M. Shonfeld and I Ronen (2015) 'Online Learning for Students from Diverse Backgrounds: Learning Disability Students, Excellent Students and Average Students' in *IAFOR Journal of Education*. The research project examined the effects of undertaking an online module on students from three different learner groups: 28 'excellent students', 68 'average students' and 25 students with learning disabilities.

[45] Y. Kotera et al. (2019) 'Towards another kind of borderlessness: online students with disabilities' in *Distance Education*, 40:2, pp. 170-86.

- Learners with specific needs, e.g. dyslexia, who may be able to use tools to access information in different ways;

One workshop participant made the point wheelchair users, through being able to access training in the same way as others, could feel a much greater sense of equality as part of the learning experience. Heritage organisations and training providers taking part in the workshops mentioned the following good practice to help support engagement in eLearning:

- Don't overpromise and under-deliver;
- Manage learners' expectations and understand what they want to do with their learning;
- Make online learning events/activities stand out, e.g. on social media;
- Make the sign-up process easy;
- Constantly think about how to make training accessible to everyone, e.g. offer training in bitesize chunks and use features such as closed-captioning and transcriptions (built in to some platforms);
- Consider how to reflect modern attitudes and issues, e.g. The Society of Black Archaeologists has been hosting webinars about archaeology following the Black Lives Matter movement;
- Provide regular feedback to learners using online mechanisms; and
- Keep staff and volunteers up-to-date on opportunities and how they stand to benefit; and
- Use data analytics (e.g. Google Analytics) to identify what worked well and therefore what to potentially change.

A number of stakeholders made the point that eLearning is not the best learning method for everyone and that some individuals will inevitably struggle to manage their learning and time schedule without support, especially those with certain learning disabilities. One provider found that part-time learners have had less capacity to adapt, resulting greater incidences of learning being paused among this cohort; and another found that more mature learners tended to prefer traditional learning approaches and have also paused their learning.

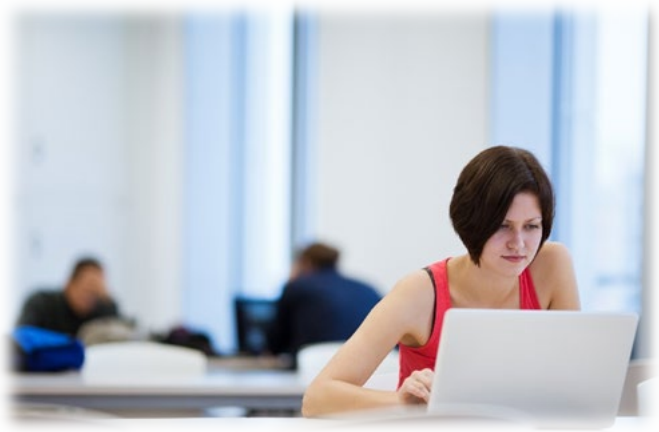
Case study message

Short, in-person courses tend to attract small numbers of students with existing and direct study links to a study area. This can lead to many potential participants being excluded due to language, visas, physical, travel and cost barriers. **Durham University** therefore wanted to increase accessibility and availability of its two new MOOC courses across the globe to better support practitioners and break down barriers to taking part.

Each student undertaking a MOOC completes a series of 'micro-steps' each week, with tasks carefully designed to be completed in lunch hours wherever possible. A multi-disciplinary approach was embraced, intertwining history, archaeology, historical geography and the creative arts, designed to keep learners engaged and appeal to a wider audience. The university describes significant EDI impact, with positive inclusive representation across gender, age, social and disability groups. The course was accessible and available to many who, due to physical, financial and social challenges would otherwise have been unable to attend.

4. eLearning challenges

This chapter sets out the general challenges associated with eLearning, followed by specific issues identified in the heritage sector. It also outlines the key skills gaps in heritage that could provide a basis for prioritising future eLearning resources, taking into account that there are possible limitations (covered in this chapter) in the ability of eLearning to teach practical and technical skills.



4.1. General eLearning challenges

Research undertaken into eLearning in different sectors has revealed an array of barriers and challenges which make the take-up of digital technologies and adoption of eLearning difficult. The Department for Education's 2019 strategy on strengthening the use of technology as a learning tool in primary, secondary and tertiary education in the UK,[46] has listed the following barriers to the effective use of technology in education:

- A need for modern infrastructure to address slow internet connections and outdated internal networking and devices;

- The need for greater digital capability and skills including:
  - The skills and confidence to use technology effectively;
  - The leadership to instigate change and to empower teachers and lectures to be confident users of EdTech;
  - The awareness of available tools and expertise needed to compare and contrast different technology options;

- The need for digital procurement capabilities to make the right choices in selecting and buying technology products; and

[46] DfE (2019) *Realising the potential of technology in education: A strategy for education providers and the technology industry*

- Concern about privacy, safety, and data security and how education providers and students are being protected.

The lack of skills, capability and confidence in the use of digital technologies is a problem which many sectors face when embracing digitisation. CITB's *Unlocking Construction's Digital Future*[47] points out that the key to the adoption of more advanced digital technologies routinely on construction sites is the development of greater digital literacy on the part of the whole construction workforce.

The COVID-19 pandemic and 'forced transition' to online delivery by higher education institutions in certain parts of the world have brought many of these barriers into sharper focus, as illustrated by the two following case studies:

- A survey of 341 teachers at **higher education institutions in the Ghaziabad region of India**[48] – which sought to explore the benefits and challenges of adopting virtual learning in higher education following Covid-19 –revealed a number of issues needing to be overcome. These included network issues, lack of teacher training, reduced learner attendance, lack of a personal touch and insufficient interaction caused by connectivity issues.

- A survey of 280 teachers and students at **universities in Nepal**[49] revealed similar issues. The survey highlighted that, while online learning may promote independence and flexibility in learning, it also places a high demand on students to manage their own learning. When asked about the challenges of online learning, participants cited the need for strong time-management skills, strong computer literacy and technological preparedness. Reliable internet connections, as well as social isolation, were also cited as challenges.

4.2. Barriers to eLearning in the heritage sector

Limitations in the ability of eLearning to teach practical and technical skills

Stakeholders and workshop participants identified limitations in the ability of eLearning to effectively teach practical and technical skills which require manual dexterity; and/or where the lab or onsite experience cannot be truly replicated. This is especially the case in sub-sectors such as archaeology, for example concerning site preparation and fieldwork; or in conservation where learners might need to be able to handle and interact with artefacts. Many participants therefore view eLearning as better suited to transmission of knowledge and developing soft skills rather than practical skills.

Notwithstanding these limitations, some participants mentioned possible applications of eLearning for technical skills, such as using videos to record a trainer carrying out a site-based activity such as

[47] CITB (2018), *Unlocking construction's digital future: A skills plan for industry*
[48] A. K. Arora and R. Srinivasan (2020) 'Impact of Pandemic COVID-19 on the Teaching – Learning Process: A Study of Higher Education Teacher' in *Prabandhan, Indian Journal of Management*
[49] P. Paudel (2021) 'Online Education: Benefits, Challenges and Strategies During and After COVID-19 in Higher Education' in *International Journal on Studies in Education*, Vol 3, No 2, pp. 70-85

artefact cleaning/object handling, or using 3D imaging/modelling for artefact analysis. More advanced techniques would have greater cost and skills implications and may extend beyond what is feasible for many heritage organisations/practitioners.

Outdated technology

The National Lottery Heritage Fund's *Digital Attitudes and Skills for Heritage (DASH) Survey*[50] - which explored the digital competence of some 4,120 people (employees, volunteers and trustees) working across UK heritage – provides an insight into the challenges surrounding the implementation of eLearning in the heritage sector. Although the DASH survey is primarily concerned with current digital capabilities of the heritage workforce, it also explores the barriers to the development of digital skills.

The latest DASH survey asked respondents "What makes it difficult for you to develop digital skills in your role?" In response, many heritage employees referred to out-of-date or inappropriate technology which acted as barriers to their individual skills and potential. Key comments included:

"Clunky IT software used by my employer that is counterintuitive and unfit for purpose"

"Being tied into a corporate technology which is not designed to accommodate specialist needs"

Several other heritage employees also mentioned poor rural broadband connectivity as a barrier to improving digital skills.

"Painfully slow internet speed makes anything more intensive than answering emails very difficult".

Although these comments relate to employees' perceptions of obstacles to the development of digital skills, they point to potential institutional, organisational and infrastructural weaknesses which may hinder mass online learning in the sector.

Digital literacy and confidence

Several participants mentioned that despite the heritage sector adapting very well to online learning during the COVID-19 pandemic, digital literacy remains a key challenge, especially for older staff and volunteers. Moreover, issues of confidence are not specific to particular age groups, job roles or length of experience. This leads to the importance of not making assumptions about an individual's level of digital literacy and emphasises how a blended approach to learning might help ensure certain individuals with lower levels of digital literacy and confidence are not disenfranchised.

Connectivity

Several participants mentioned that issues relating to internet connectivity and broadband speed can act as a barrier to eLearning, especially if several people in a household are using the internet at the same time. eLearning also presupposes that learners possess devices capable of accessing the

[50] National Lottery Heritage Fund (2020) *Digital Attitudes and Skills for Heritage (DASH) Survey Results 2020*

internet which may not always be the case, especially amongst older people who might be working as volunteers.

Costs for maintaining and licensing technology

A small number of workshop participants raised the cost of having to purchase devices and mobile data allowances for volunteers to participate in eLearning.

Several stakeholders mentioned that for eLearning to be effective, it ought to be supported by intelligent learner management systems – which can be costly – to host all of the eLearning in one place (i.e. seminars, videos, tutorials etc) as well as optional user logins, progress saving and other auto-communication systems.

Lack of interaction and 'digital fatigue'

eLearning does not fully recreate the lab or lecture hall environment, meaning that a single lecture or course taught through software such as MS Teams or Zoom might offer little opportunity for discussion between learners or reflection/feedback between learner and tutor. This ties in to the view that online training sessions tend to be better suited to knowledge sharing than practical skills acquisition.

Furthermore, several stakeholders and workshop participants emphasised that many staff in heritage enjoy the networking opportunities that face-to-face training and conferences can offer. Whilst not wholly missing in an online learning environment, these aspects are not as prominent and could contribute to reduced participation levels.

Digital learning fatigue

As a consequence of successive lockdowns during the COVID-19 pandemic, anecdotal evidence is emerging of 'digital learning fatigue' and the associated barriers of self-paced learning. This could be especially detrimental for those who would ordinarily take longer to learn and might be at further risk of falling behind. Whilst not necessarily linked to the effects of the pandemic, *Elucidat* - an organisation which supports employers to develop eLearning solutions – has analysed over 65,000 pieces of digital learning and revealed an average session time of 15 minutes. This compares to two minutes that visitors typically spend on a website before moving on.[51] Clearly therefore, eLearning needs to work hard to sustain the attention spans of young people and adults alike, and be designed in such a way to respond to attention spans that might be lower than in an offline learning environment.

Attitudinal barriers

Culture and attitude within the heritage workforce may act as an obstacle to implementing eLearning. The DASH survey revealed that many volunteers had little inclination to develop digital

[51] https://www.elucidat.com/blog/elearning-session-time/

skills or engage with online learning processes, often quoting their age as the main reason. In response to the question about difficulties in developing digital skills, volunteers said:

"I don't enjoy online training. I like face to face, one to one teaching and that's hard to come by." "Completely not interested."

"I tend to forget things more these days."

"I used to work in the learning technology sector but actually since retiring prefer not to use some of it (social media) for my own purposes. I wouldn't be interested in making this a major part of my volunteering role I'm afraid!"

A disinclination to engage with online resources was also reported among trustees, many of whom also quoted age as a barrier:

"Getting too old to learn too many new tricks, don't want to use social media."

"Lack of interest and enthusiasm… I don't enjoy learning new digital skills."

Data from DASH provides evidence of an aversity to online systems and a preference for face-to-face training among older trustees and volunteers (although this issue may be less pronounced in light of COVID-19). Employed staff were found to show a greater willingness and propensity to improve their digital skills and work with digital technology, suggesting cultural and attitudinal barriers may be most acute amongst voluntary staff employed in heritage and cultural institutions.

One stakeholder interviewed for this research made the point that there is a stereotype that the heritage sector consists of "elderly white men who might struggle with technology", but that working in heritage can actually mean working at the cutting edge of science.

Despite these barriers, the COVID-19 pandemic appears to have heralded a shift in attitudes. Several stakeholders and workshop participants acknowledged that individuals' willingness to engage with eLearning has increased markedly during the pandemic as scepticism has given way to necessity. Following a period of adaptation in response to lockdown measures, the sector as a whole – and a range of job roles – are finding it easier to identify with the benefits of eLearning. There is a notably stronger sense of enthusiasm among volunteers, especially due to not having to pay for travel to attend offline training/seminars for which they may not have been able to reclaim expenses.

Case study messages

- When developing MOOCs at **Durham University**, the conversion of face-to-face practical courses into a digital learning experience brought some initial challenges, notably how to keep learners engaged. This was ultimately achieved using a varied mix of resources such as photographs, 3D scans, instructional videos and audio. Key lessons learned included setting aside proper time and resources to plan (including choosing topics carefully); involving learners upfront to manage expectations; bringing in the right technical expertise and using quality footage of events.

- As part of virtual labs at **Durham University's** Department of Archaeology, it was noted that students weren't able to fully appreciate aspects such as weight and texture of museum artefacts. It also proved quite time-consuming, with the usual three-hour session taught in the lab translating into more than 20 hours of online one-to-one sessions with all students. Additionally, the Department felt that a specific type of visualiser would have been better to use on larger objects, but it was not available in time;

- Lessons learned from the implementation of VR technology at the **Jim Clark Motorsport Museum** has a number of potential synergies with eLearning. Firstly, digital technology can be immersive but expensive, so may benefit from a sponsor or collaborator that could lead to a longer lead-in time to launch. Secondly, possible tech teething problems might also occur. A VR headset could bring accessibility issues for some users and COVID-19 restrictions could affect the safe use of such hardware.

4.3. Tackling skills gaps in heritage

Recent research has revealed a range of skills gaps in the UK heritage sector, defined as skills lacking amongst the existing workforce. eLearning may be well suited to addressing some of these – especially knowledge gaps. Based on the evidence to date, more specialist technology may be needed if eLearning were to be used to address more technical and practical skills gaps.

According to a CEBR report into the nature and extent of skills gaps in the heritage sector, the most common is 'the ability to manage own time and prioritise own tasks', followed by 'specialist skills or knowledge needed to perform the role'[52]. Evidence from wider literature sheds further light on these 'specialist' gaps. A study from UCL highlights 'handling digital collections and data' as a key technical skill lacking in the heritage sector[53]. In commercial archaeology, the most cited skills shortages (i.e. skills hard to find in the labour market) include artefact conservation, fieldwork (invasive and non-invasive) and post-fieldwork analysis, which are often bought in from specialist firms[54].

The *Historic Environment and Cultural Heritage Skills Survey*,[55] (English Heritage, 2013), found the most pressing skills gaps across heritage to be centred on technical and specialist skills, including:

- Archaeology: Invasive and non-invasive fieldwork skills, archaeology science skills, desk-based or environmental assessment skills, cataloguing and recording skills and post-field work analysis skills;

- Conservation: Preventative and interventive conservation, conservation science skills, knowledge of the history of the production/creation of objects, preservation and handling techniques, cataloguing and recording skills and storage techniques;

[52] CEBR (2019) *Skills gap/needs in the heritage sector*
[53] UCL (2017) *Skills gaps, shortages and needs in the heritage science sector*
[54] Charted Institute for Archaeologists (2017) *Archaeological Market Survey 2017*
[55] TBR (2013), *Historic Environment and Cultural Heritage Skills Survey* (English Heritage, Creative and Cultural Skills)

- Cultural heritage institutions: Collections care, management and interpretation, preservation and handling techniques, storage techniques and collection management, digital preservation and management, cultural asset management, interpretation, preservation and restoration, recording, describing and inventorying/cataloguing and basic conservation and restoration skills;

- Planning and other related services: Managing the planning application process, managing information and knowledge relating to the planning service, facilitating the sustainable development of places, the use of materials & repairs to historic buildings, the techniques and standards involved in research and investigation, regulations, controls and sanctions in planning and building and conservation policy.

Despite evidence of gaps in these critical skill areas, the CEBR research reveals the UK heritage sector to be falling slightly behind other sectors in terms of the proportion of staff undergoing training. Approximately 31% of heritage employers reportedly putting their entire workforce through training in a given 12-month period, compared to 36% of all UK employers. Generally, employers in the heritage sector tend to tackle skills gaps through recruitment drives rather than through training: 38% of heritage employers reported increasing spend on recruitment to tackle skills gaps, while 13% offered training to less experienced staff as a solution to skills gaps.[56]

Similar findings were also reported in Arts Council England's 2018 report on resilience in the arts and culture sector.[57] Although training – or the allocation of resources for staff development – was recognised as an integral part of ensuring sector resilience, only 3% of 1,000 surveyed organisations believed that the sector was 'very much' allocating resources to staff development, therefore it could be lagging behind others in terms of workforce investment.

[56] CEBR (2019) *Skills gap/needs in the heritage sector*
[57] Golant Media Ventures and the Audience Agency (2018), *What is resilience anyway? A Review* (Arts Council England)

5. Effective delivery of eLearning

This chapter examines key considerations for effective delivery of eLearning in the heritage sector. This includes building sector resilience in the face of change; types of content and delivery approaches that might work best; capacity and capability of the sector to implement new solutions (including digital skills); support and guidance likely to be needed; the role that academia and other bodies could play; and effective approaches to evaluating the quality and impact of eLearning.

5.1. Building resilience

Arts Council England's recent Review, *What is Resilience anyway?*[58] sets out a framework of resilient behaviours for arts and culture organisations. As part of this, 'allocating resources for staff development' is a key behaviour for building resilience, meaning that training is also a central component in building the ability and capacity of the arts, culture and heritage sector to adapt and thrive in a changing world.

Arts Council England's Review also emphasises how organisations need to effectively respond to change, including 'planning for different potential scenarios' and 'having well defined processes for identifying, testing and implementing new ideas.' Furthermore, 31% of the circa 1,000 arts and culture respondents interviewed as part of the research, equated resilience with organisations that were 'open or responsive to change'.

For the heritage sector, this means doing more than simply training the workforce, but ensuring that the training approach is capable of adapting to changing circumstances. In response to the COVID-19 pandemic and changes in how people in organisations move and interact – eLearning will be critical to ensuring that the sector's training offer remains accessible.

5.2. eLearning content and suggested approaches

Participants struggled to identify what might be termed 'innovative models' for training delivery in the heritage sector, but broadly agreed that eLearning can lend itself well to efficiently and cost-

[58] Golant Media Ventures and the Audience Agency (2018), *What is resilience anyway? A Review* (Arts Council England)

effectively developing the following types of skills, which do not necessarily require instructor-led assessment and practise:

- **Knowledge-based training and CPD**, e.g.
  - Train-the-trainer;
  - Project management;
  - Finance;
  - Health and safety;
  - Legislation and regulatory requirements;
  - Applying ethical standards (interpretation, judgment and balance);
  - Context-based theory, e.g. consent process for listed buildings, managing planning applications where there is a heritage element, interacting with local communities;
  - Knowledge sharing between practitioners; and
  - Consultancy.

- **Softer skills** developed through coaching and mentoring, e.g.
  - Communication;
  - Leadership;
  - Problem solving;
  - Time management; and
  - Digital skills.

Evidence suggests that traditional 'hands-on' heritage skills are more difficult to develop and teach online, for example craft work on buildings, observations, analytical surveys, recording and practical conservation work. However, most stakeholders commented that online learning could work well as an effective introductory course or supplementary suite of learning alongside offline technical skills development, thus delivering a blended pathway of learning. In other words, it could play important role in introducing learners to techniques which they then practice onsite.

These views broadly correspond with the findings of the desk research, including Historic England's Training Needs Analysis, which emphasise the value of a blended approach. The *Lifesaver* case study also suggests that the most effective way of delivering technical skills would be through a combined approach in which eLearning reinforces instructor-led, face-to-face training, especially where eLearning alone might not be sufficient in addressing highly specialist technical skills gaps.

Stakeholders and many workshop participants are generally of the view that a blended approach for delivery of skills-based training – combining online and face-to-face elements – could work very well for the heritage sector in the future. This approach could involve the knowledge-based elements of a course being put online for learners to work through at their convenience and which serve as an introductory corollary to more practical, face-to-face training. Such an approach would ensure that the sector enjoys the benefits of eLearning (convenience, accessibility etc.) whilst retaining offline elements for further developing and practising technical skills.

As illustrated by the DISTANCE project, the use of VR and immersive technology in the heritage sector could provide a useful training model for practical and technical job-specific skills such as fieldwork, conservation and collections care – which have traditionally been learned onsite and

which may not lend themselves easily to online courses. However, almost all stakeholders who recognise the potential of AR/VR mentioned that this technology would have to be of exceptionally high quality in order to emulate hands-on skills. It is acknowledged however that powerful AR and VR gaming technology would likely be beyond the budgets of most heritage organisations.

A key advantage of simulated learning in the construction sector is to mitigate the cost of training that might otherwise be very expensive, for example plant operations. However, the set-up costs and investment in technology that may be needed to replicate these for simulated heritage training environments (such as for archaeological fieldwork) may be high and would need to be carefully balanced against the cost of more traditional training methods.

5.3. Capacity and capability to deliver

On the whole, stakeholders are divided over the issue of the capacity of the heritage sector to develop and implement more eLearning. On the one hand, some draw great optimism from developments and attitudinal shifts during the pandemic, i.e. they point to a sector that was relatively new to eLearning but has adapted quickly. The sector's knowledgeable staff are also cited as being in good position to share this knowledge online. On the other hand, stakeholders believe that the sector still has a long way to go to fully adapt to eLearning. One pointed out that the sector seems to have largely confined itself to basic eLearning techniques and information-sharing. Budgets and funding issues are also a concern and some stakeholders mentioned that the sector may have limited funds to invest in more sophisticated forms of blended and online learning.

Finally, the heritage sector is perceived as lacking a joined-up, industry-wide online learning portal which could bring together online learning resources from a range of providers in one place, enabling individuals and employers to search and access training that suits their needs. An industry-approved, one-stop-shop solution such as this may therefore work well as a centralised hub of online training opportunities for the heritage sector. Other sectors could provide useful models for such wrap-around online portals or learner management systems, such as the Supply Chain Sustainability School, mentioned above.

5.4. Digital skills gaps in the heritage sector

Instances of digital skills gaps may limit the capacity of the heritage sector to effectively implement and deliver eLearning for skills-based training, including set-up and use of Teams and Zoom accounts.

The *Historic Environment and Cultural Heritage Skills Survey* of 2013,[59] which involved telephone interviews with 1,000+ heritage professionals and organisations found that digital skills gaps were prevalent across all sub-sectors of heritage to varying degrees, concluding that specialist IT and digital skills (such as social media, web optimisation, website management and design) were particularly lacking.

[59] TBR (2013), *Historic Environment and Cultural Heritage Skills Survey* (English Heritage, Creative and Cultural Skills)

The absence of digital skills was found to be especially pronounced amongst cultural and heritage institutions, where they tend to underpin important marketing, administrative and business development processes. For example, the survey found that 41% of those working in galleries considered themselves to be lacking in important administrative and support skills, including IT and digital skills; additionally 21% of architectural, garden and landscape historians working in conservation considered themselves to be lacking in digital skills.

These findings broadly reflect other research, for example, UCL's report on skills gaps in the heritage science sector found that 'digital media' constituted a 'serious or significant' skills gap in specialist preventative conservation.[60]

The DASH survey found that while 90% of respondents believed themselves capable of using e-conferencing technology, levels of confidence around the use of collaborative digital workspace such as google docs or Basecamp were somewhat lower (only 50% of volunteers and trustees said they felt confident using this technology, compared to 70% of employees). Perceptions of individuals' ability and confidence to use social media to promote an event was also low – only 28% of volunteers, 38% of trustees and 53% of employed individuals felt confident completing these activities.[61]

These findings point to notable differences in digital skill levels between different roles in heritage, with volunteers, lesser-skilled roles and those having benefitted from less formal training generally less confident in using digital technology; and concentrations of skills gaps centred on certain technologies, including use of virtual spaces and social media for marketing purposes.

5.5. Support and guidance needs

Participants mentioned that advice, guidance and 'how-to' support would be useful in relation to the following:

- More train-the-trainer opportunities;
- Assistance in finding high-quality eLearning resources amongst those already available – free and paid-for;
- Advantages and disadvantages of different resources and platforms;
- How to plan and coordinate eLearning for a team of people (e.g. working from a template to identify audience needs, develop objectives and outcomes, and determine how those would best be achieved in relation to the subject matter and target audience);
- Effective eLearning tips; and
- Developing content that is suitable for online learning; and
- Best practice from within and outside the sector, or even having the opportunity to work with construction sector partners as part of supply chains.

[60] UCL (2013), *Skills gaps, shortages and needs in the heritage science sector*
[61] National Lottery Heritage Fund (2020) *Digital Attitudes and Skills for Heritage (DASH) Survey Results 2020*

5.6. Role of Historic England, academia and other bodies

Historic England's Training Needs Analysis 2020/2021 (328 respondents) revealed that Historic England should:

- Provide policy leadership to the sector as an authoritative heritage organisation;
- Share its technical expertise more widely;
- Provide training where there are known skills shortages;
- Disseminate best practice case studies;
- Prioritise content that is not delivered by other providers; and
- De-prioritise CPD training (where already delivered by professional bodies and employers).

Most stakeholders and provider workshop participants believe that academia is well-placed to support the heritage sector to develop more eLearning through their existing knowledge of learning platforms and being well-placed to share best practice. It was suggested this could be achieved through formal partnerships or knowledge exchange programmes, although this would be subject to whether the academic institution has sufficient capacity. Such relationships could be established if heritage organisations or sector bodies were to make contact with university faculties, such as archaeology or conservation departments.

Among the minority of stakeholders more sceptical about the role of academia, it is felt that the separation between academia and the commercial world (for instance archaeology) may act as a barrier, i.e. the skills required of archaeologists working on a commercial site may be very different from those taught to students at university. Others remarked that where certain universities use high-end and sophisticated tech infrastructure, it would be important to ensure this integrates well with systems used by heritage organisations, especially smaller ones.

One stakeholder suggested that a good way to develop and roll out effective eLearning would be through heritage professional bodies and membership associations. Since these organisations are in close contact with their members, it is felt they are in a good position to assess and respond to their needs and concerns.

5.7. Evaluating the quality and impact of eLearning

When asked about the best means of evaluating the quality and impact of eLearning, most participants tended to mention basic instruments of measuring learner satisfaction and engagement, such as surveys, quizzes, 'happy sheets' and polls that could be conducted during or immediately following an eLearning session. Several pointed out that many digital platforms and software packages have such features built in. Other suggestions included participation metrics, including number of sign-ups/dropouts.

Less commonly mentioned suggestions included depth interviews or conversations with learners to help evaluate quality and impact; as well as maintaining online training logs for individual learners to track progress and performance. One stakeholder suggested that some businesses might want to undertake some form of cost-benefit analysis.

One provider described how there is a lot of on-going discussion in the wider HE sector about different ways of getting student feedback but at the moment they are responding to the pandemic situation and need to evaluate what's working to see how that can be harnessed and sustained.

In order to evaluate how effectively eLearning teaches technical skills, one stakeholder recommended using assessors to evaluate skills learned through eLearning and then comparing the data to those learning through traditional instruction. A comparative methodology (involving a control group) could enable conclusions to be drawn about the differences in effectiveness between eLearning and traditional learning. Such an approach would need very careful design and results may be hard to determine as robust and statistically significant.

6. Conclusions

6.1. eLearning practice

- **Differing perceptions on how eLearning applies to heritage:** The research has highlighted a mix of views across the sector regarding what eLearning really means in practise, the resources needed to delivery it and how it could be used to best effect in heritage. This suggests eLearning needs to be more clearly defined and that greater awareness and understanding is needed.

- **The COVID-19 pandemic has accelerated digitalisation in the heritage sector.** Heritage organisations are increasingly accepting of digital modes of learning and primarily through necessity, are striving to overcome practical and attitudinal barriers to implementation.

- **There are limitations in the ability of eLearning to impart practical and technical skills.** The research points to eLearning lending itself particularly well to knowledge-based training, CPD and cross-cutting soft skills which do not necessarily require instructor-led assessment and practise. There are certainly opportunities for technical and practical skills training using online methods, with evidence suggesting that a blended learning approach – combining online and face-to-face components – would be most desirable and lead to better outcomes than online alone.

- **Effective delivery mechanisms for eLearning are about the 'art of the possible'.** Heritage organisations and education providers mainly use online platforms such as MS Teams and Zooms to facilitate training, with the pandemic leading to an enhancement of what is already possible rather than stimulating major – and potentially expensive – technological innovations. That said, the research has revealed examples of range of interesting practices such as virtual labs, virtual fieldwork and educational video tours, which are potentially transferable if adapted to local settings, resource levels and budgets.

- **It is unclear what the future might hold for the growth and prevalence of eLearning.** The research has revealed mixed views on the potential either for a boom or a return to more traditional face-to-face methods, especially concerning technical and practical skills acquisition. That said, changes to how people in organisations move and interact as a result of the COVID-19 pandemic mean that eLearning is likely to be critical going forward to ensure the sector's training offer remains accessible.

6.2. eLearning benefits, access and challenges

- **eLearning brings a range of identified benefits for heritage organisations, education providers and learners.** Benefits include the flexibility to undertake training at a convenient time, often with only a simple device, yet without the costs associated with venue hire, facilitators and travel expenses. eLearning can also help organisations to significantly expand the geographical

reach of the target audience, unlock new and additional revenue streams, and provide continuity of learning in adverse situations, as evidenced by the COVID-19 pandemic.

- **eLearning has the power to make training more accessible to adult learners and those with learning and physical difficulties in the heritage sector.** It can especially support those who might otherwise struggle to attend courses, for example due to work or caring responsibilities. For those with learning difficulties or physical disabilities, it can offer a more flexible pace and incorporate tools such as closed captioning and transcriptions.

- **eLearning needs to be well planned and responsive to needs.** To maximise accessibility benefits, there is a need to fully understand and manage learner expectations, and to design and develop courses in a way that best responds to their needs. Further research would be needed to fully understand the strengths and outcomes of eLearning for people with different types of impairments;

- **A range of challenges to eLearning prevail in the heritage sector, mainly attitude, confidence, digital literacy and internet connectivity.** One of the biggest challenges associated with eLearning is breaking through attitudinal barriers, especially among older workers and volunteers. That said, the COVID-19 pandemic has stimulated a shift in attitudes as scepticism has given way to necessity. Other key challenges faced by individuals and heritage organisations include lack of digital literacy, outdated technology and poor internet connectivity.

6.3. Effective delivery of eLearning

- **The heritage sector lacks quality guidance and 'how-to' support**. This includes good practice for how to improve the quality of learning (especially important when learners are paying high course fees), encourage adoption and uptake of eLearning, and to help heritage organisations and learners find courses they need in an easily accessible place.

- **Historic England, academia, heritage professional bodies and membership associations are well-placed to support the sector to strengthen eLearning.** Subject to capacity, there is appetite for this to be achieved through sharing best practice and case studies, dissemination of guidance and signposting to quality resources, and via formal partnerships or knowledge exchange programmes.

- **Evaluation of eLearning takes place but is limited.** Evaluation activities mainly comprise basic instruments such as learner satisfaction surveys, quizzes and polls rather than more meaningful outcome and impact measurement. Sharing of good practice would be useful, although any recommended approaches for deeper evaluation would need to be balanced against an organisation's capacity and available resources.

7. Recommendations

Building on insights from all stages of the research, several opportunities have been identified to support the heritage sector in embracing eLearning.

Many heritage organisations have shifted their classroom training online over the past twelve months in response to the COVID-19 pandemic, but there remain a number of areas needing to be addressed to ensure the sector can build resilience to wider changes and embrace eLearning in a proactive, thoughtful, and impactful way.

The key challenges requiring improvement fall into two core categories:

- Access to training; and
- Upskilling/CPD.

The recommendations outlined below are designed to support the sector in overcoming these challenges and can be seen as building blocks to deliver the foundation of eLearning best practice across the heritage sector. Each of the recommendations would require further scoping to refine suitability and cost.

7.1 Access to training: Implementation of a Heritage Learning Hub

Overview: Development and implementation of a centralised platform to facilitate the delivery, access, and support of training opportunities across the heritage sector.

Challenges addressed: Access to training; Absence of networking opportunities; Costs for maintaining and licensing software.

Considerations: Access to quality and consistent training and support is lacking within the heritage sector. As seen within the report, whilst many organisations do have their own eLearning provision, the quantity, quality, and consistency of the content and technical outputs vary immensely between organisations and their different learner audiences. Similarly, the training approaches available for staff and volunteers varies greatly across the sector, with inconsistent levels of feedback and little networking and peer to peer support opportunities available.

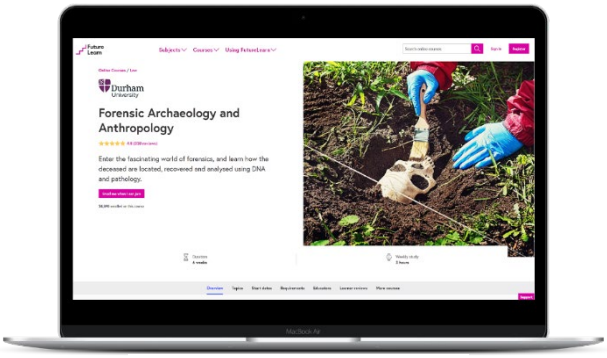
The introduction and implementation of a Heritage Learning Hub will deliver a best-in-practice consolidated platform to support heritage organisations build sector resilience and capability for the future.

Increasing access to training: One central Learning Hub could provide an engaging learning environment and promote informal and formal learning opportunities for all regardless of learner type or location:

- Informal Learning: Personal development courses and resources for just-in-time support; and
- Formal Learning: Formal programmes of learning (mandatory and compliance).

Encouraging communities of practice: The Learning Hub could be a catalyst for generating discussion and networking opportunities, sharing knowledge, challenges and best practice across the sector, thus encouraging collaboration and partnership working.

As demonstrated through Durham University's case study, Massive Online Open Courses (MOOCs) delivered through a centralised online platform can yield huge benefits and impact for individuals and the wider heritage sector, increasing inclusive access to training for all.



Durham University MOOC

The Technology: The most appropriate technology to support delivery of the Heritage Learning Hub would be a Learning Management System (LMS).

An LMS is a software application specifically designed to host, deliver, and report on learning. Typically cloud-hosted, learners can access learning content from any device, from any location to facilitate a just in time approach to training for learners.

- **Pros:** With the ability to host a variety of content types, LMS systems help to deliver and track informal and formal training, capture learner feedback, encourage discussion and communities of practice, provide ongoing learner engagement and support opportunities, with access to data and insights for accurate reporting;

- **Cons:** LMS can be costly to implement and often include ongoing learner licence fees based on learner numbers. Internal resource would likely be required by Historic England, including financial and human, to support implementation, rollout, and ongoing support.

  "Learning Management Systems (LMS) provide a framework through which learning content is delivered and managed. An LMS allows for an anytime, anywhere learning environment, delivering and tracking eLearning courses and testing. An LMS enables the organisation to use the learning content from courseware authoring tools and presentation of the content to students. Learning Management Systems are related to training software." Capterra.[62]

Platform Capabilities: The platform should encourage learner engagement, and deliver personalised learning within the context of learner needs.

[62] Capterra is a free online marketplace vendor serving as an intermediary between buyers and technology vendors within the software industry.

To facilitate the best learner experience, and to provide access to a variety of learning opportunities, media and content, our recommendation would be for the Heritage Learning Hub to include the following capabilities as a minimum:

- **Multi-media formats** – hosting of multiple asset types such as SCORM[63], video, audio, documents, to provide a rich learning experience;
- **Face to Face/Virtual Classroom** – facilitates promotion, booking, delivery and tracking of classroom training and webinar sessions;
- **Communities of Practice** – encourages group discussion, share ideas, challenges and best practice for collaboration and support;
- **Assessments** – tests can be built within the LMS to formally assess knowledge and understanding;
- **Assignments** – formal assignments can be delivered and tutor-marked to facilitate delivery of formal learning programmes;
- **Evaluations** – to instantly capture learner feedback pre, during or post learning to easily facilitate support with impact measurement;
- **Certifications** - delivers informal or formal certification of learning;
- **Pathways of Learning** – multi-media assets and activities can easily be brought together to support blended learning;
- **Reporting** – access to data and insights to help support success and impact evaluation;
- **Messaging and Notifications** – in-built messaging facilitates communication and ongoing learner engagement;
- **Branding** – Historic England branded;
- **Marketplace** – able to "house" content from multiple organisations to encourage delivery of best practice training;
- **Management** – easy management of learners, enrolments, scheduling, and administration; and
- **Integration** – with other systems to streamline access and data consolidation.

Recommended Output 1: Platform Review & Recommendations Paper

In order to scope LMS requirements in detail and to identify the most appropriate solution, we would recommend that further scoping is undertaken, with research and review conducted into LMS systems best suited to the needs of the sector, now and for the future.

The Review & Recommendations Paper should include:

- Further scoping of requirements (through research with sector and Historic England);
- Appropriate LMS platform review;
- Optimal LMS recommendation;
- Evaluation access to test platform for Historic England internal evaluation;
- Online live demonstration;

[63] Shareable Content Object Reference Model (SCORM) is a collection of standards and specifications for web-based electronic educational technology. It defines communications between client-side content and a host system, which is commonly supported by a learning management system.

- LMS implementation pricing; and
- LMS Implementation timescales.

Recommended Output 2: Research & Review of Existing eLearning

Throughout our research, it is evident and understandable that there are differing quality levels, and media types, of eLearning and training resources available to support the heritage sector.

In order to understand what eLearning materials could support the delivery of a Heritage Learning Hub, to set benchmarks for quality, and to improve access to training, an eLearning content review is recommended.

This review should include partnership working across the heritage sector, to understand and quality check existing eLearning content and where gaps are for development.

As a minimum the review should encompass:

- Formulation of, or use of an existing, Advisory Group – to encourage partnership working across heritage, training, and advisory organisations to ensure representation;
- Development, or review of existing Competency Mapping – to benchmark understanding of core skills and competencies required by the sector now and for the future;
- Understanding of available eLearning content, media formats, ownership, IP, and sharing rights;
- Mapping of available content against Competency Map; and
- Identification of gaps for new eLearning or re-development.

7.2 Upskilling: eLearning Awareness

Overview: Increasing awareness and understanding of technology, opportunities, and applications for eLearning within the heritage sector.

Challenges addressed: Limitations in the ability of eLearning to teach practical and technical skills; onnectivity; Assumed levels of digital literacy; Costs for maintaining and licensing software; Lack of interaction/feedback; Attitudinal barriers; Tackling skills gaps in heritage.

Considerations: The research has shown how upskilling around eLearning could significantly benefit the sector. For example, organisations generally accept eLearning as a beneficial training tool and have seen some significant benefits throughout the pandemic period with much training being delivered online. However, the research has identified mixed perceptions about what eLearning involves, how it can be applied within a heritage environment, as well as typical costs. These represent potentially serious barriers to take-up which is still very limited.

To tackle the challenges outlined within this report, including but not limited to the use of outdated technology and attitudinal barriers, more needs to be done to inspire curiosity around what digital

learning truly is and the art of what is possible. This could best be achieved by focusing on upskilling decision-makers in organisations about eLearning, who could then pass this knowledge on internally.

Recommended Output 3: eLearning Design Scoping Report

Many people in the heritage sector feel overwhelmed by the different types of technology available, but lack the skills needed to make best use of them for learning. To overcome these and other attitudinal barriers to technology and e-Learning, it is key that people are aware of how they can embrace it. Upskilling is therefore needed to help showcase the different technologies available to support eLearning and how these could be applied within a heritage setting.

To support the journey, and to build on the research already undertaken, we recommended the production of an eLearning Design Scoping Report to support the upskilling of sector with the following areas:

Introduction to eLearning

- What is eLearning?
- The benefits of eLearning; and
- The challenges of eLearning.

eLearning types and applications:

- Types of different eLearning technology outputs (SCORM modules, interactive graphics, video (animated, live action, interactive, 360), audio, VR, AR, games, webinars, virtual classrooms, learning campaigns, etc.);
- Applications for eLearning (practical skills, knowledge/theory transfer, exploration, behaviour change, culture change, assessment, and feedback);
- Best practice showcase (examples and their application within Heritage);
- Outline costs for different technology tools & outputs; and
- Suggested digital learning suppliers.

Learning Design:

- Learning theories for adult learners; and
- eLearning design principles – how to design eLearning for engagement.

Technical Specifications:

- Minimum recommended technology specification for **designing** eLearning; and
- Minimum recommended technology specification for **delivering** eLearning (platforms, support, cost).

Organisational Strategy:

- Partnership working – understanding where digital capabilities already exist within an organisation and how they can support eLearning; and
- Building the business case for eLearning (overcoming attitudinal/ cultural/ financial/ technical/ resource barriers).

Recommended Output 4: Interactive eLearning Module

This Scoping report could then be developed into an interactive eLearning module, with a supporting downloadable resource toolkit, to set a benchmark for best practice eLearning across the sector. It could be designed for sector-wide, flexible delivery through the Historic England website, the Heritage Learning Hub, or other organisational Learning Management systems.

Recommended Output 5: Diagnostic Tool

Development of an interactive, diagnostic tool to help heritage organisations understand their existing internal capabilities for eLearning, and where they may need further help/support.

7.3 Upskilling: Adoption of Marketing Approaches for eLearning

Overview: Increase awareness and understanding of how marketing tools and approaches can be applied to heritage eLearning.

Challenges addressed: Limitations in the ability of eLearning to teach practical and technical skills; Attitudinal barriers; Outdated technology; Assumed levels of digital literacy.

Considerations: The research has identified many good practice examples of how technology such as VR, interactive video and online platforms have been applied within a marketing setting, to enhance visitor experience and provide funding streams throughout the COVID-19 pandemic, as evidenced from the case studies.

This demonstrates that digital skills and capability already exist within some heritage organisations, but not necessarily within the training function. There are disconnects between the awareness of the existence of those skills, and how they can be accessed for application within a training setting.

David Parr House:
Virtual Tours and 'Explore' Platform

Recommended Output 6: Community of Practice

Encouragement of partnership working across heritage organisations could be facilitated through the introduction of a Community of Practice, to encourage the sharing of ideas, best practice, and collaboration and peer to peer support across the sector.

This Community could be facilitated by Historic England, and delivered through the Heritage Skills Hub, as outlined above, or through an alternative platform such as LinkedIn, Facebook, or similar.

Recommended Output 7: Diagnostic tool

Development of an interactive, branched diagnostic tool to help heritage organisations understand their existing internal digital capabilities for eLearning, and where they may need further help/support.

Recommended Output 8: Interactive eLearning module

Development of an interactive eLearning module to increase awareness of how digital marketing tools, technology and approaches can be applied within a training setting, including best practice examples, supporting downloadable resources and signposting. The module could be designed for sector-wide, open-access delivery through the Historic England website (as an html5 file), the Heritage Learning Hub, or other organisational Learning Management systems (as a SCORM 1.2 file).

7.4 Upskilling: Training Evaluation & Impact Measurement

Overview: Upskilling heritage organisations to evaluate the success and impact of their training initiatives.

Challenges addressed: Tackling skills gaps in heritage.

Considerations: Throughout our research, it has become evident that there are considerable knowledge and skills gaps within the sector to evaluate the success and impact of training.

Whilst a handful of organisations referenced use of 'happy sheets' to evaluate the success of classroom training, little evidence of eLearning evaluation was evident, with no best practice examples identified for the successful demonstration of the impact training is having on individuals, their organisations or the wider sector as a whole.

Upskilling heritage organisations with the skills they need to design training to have real demonstrable impact will:

- Help set benchmark standards for training evaluation within the sector;
- Enhance organisational ability to demonstrate return on investment;
- Increase individual and organisational capability across the sector; and
- Increase opportunities for raising organisational awareness and recognition through the sharing of success stories, and case studies, and award submissions.

Recommended Output 9: Training Evaluation and Impact Measurement Learning Programme

It is essential for success and impact criteria to be set up front, at the start of the learning design process, to ensure training interventions are built to achieve required outcomes from the outset.

We recommend that a 'train the trainer' programme of learning be designed and developed. Aimed at those delivering, supporting, and evaluating training initiatives within heritage, the programme should be designed to increase skills and capability needed for heritage to build for, and measure, the success and impact of training initiatives.

The programme would support heritage organisations to plan for success from the outset, enabling them to identify early on what success looks like for their initiative, and understand the potential impact that success could have on their staff, volunteers, organisations, environment, and wider sector.

The 'train the trainer' programme of learning content should include the following:

- What is training evaluation?
- The difference between success and impact;
- Benefits of evaluating success & impact;
- Challenges of evaluating success and impact;
- What is the 'impact' of measuring impact?
- Models for training evaluation;
- Frameworks for planning and measuring success and impact;
- How partnership working can support training evaluation;
- Best practice examples of training success & impact;
- Toolkit of templates and resources to support application within heritage.

The programme would upskill heritage organisations in moving beyond 'happy sheets', to being able to plan for success and demonstrate the individual and organisational impact of their training.

7.5 Upskilling: eLearning Accessibility Guidelines

Overview: Design of best practice guidelines to support heritage with the design and delivery of eLearning which is accessible for all.

Challenge addressed: Tackling skills gaps in heritage; Connectivity; Outdated technology; Attitudinal barriers; Loss of interaction/feedback; Assumed levels of digital literacy.

Considerations: The research has revealed positive examples of best practice where carefully designed digital training has had hugely positive inclusive impact on individuals, giving them training opportunities they would never have been able to access before (as evidenced within the Durham University MOOC and David Parr House case studies).

However, throughout the research it has become clear that a key barrier to using eLearning further within the heritage sector lies with the requirement for training to be inclusive and accessible for all, but the research points to a lack of understanding in how to meet that requirement with digital training. Furthermore, the research has identified perception issues around what accessible eLearning is, aligned with capability and attitudinal barriers preventing the heritage sector embracing eLearning for their audiences.

In order to tackle the challenges around accessibility and inclusivity of training highlighted within this report, an empathic, human-centred design and development approach to digital learning is needed. These are skills that appear to be lacking within the heritage sector based on the research.

Inclusive design is intertwined with accessibility, an area in which many organisations are striving to improve. Overall, it acknowledges that all learners are individual and have different needs, and it strives to meet them, one by one. It can't be a one-size-fits-all deal – it has to take everyone into account.

The success of any piece of learning depends on a strong understanding of the learner, their motivations and barriers to eLearning, and how can the learning be designed to be inclusive and supportive of their needs.

Recommended Output 10: Design of eLearning Accessibility Guidelines

Building on existing insights, we recommend the scoping and development of eLearning Accessibility Guidelines for the heritage sector, to provide guidance and support to increase awareness of how to design eLearning that is accessible for all, whilst still maintaining strong levels of interactivity to increase learner engagement.

The Guidelines will provide a 'best practice' outline for heritage eLearning adoption, and will consider:

Overview

- What is meant by accessible eLearning?
- An overview of Accessibility Standards;
- Benefits and challenges of accessible eLearning; and
- Best practice examples of accessible eLearning.

Learner Mapping

- Understanding your audience (demographics and learner personas);
- How to design for accessible eLearning (learning design principles and best practice theory); and
- Supporting learners (additional on and offline support opportunities, digital champions, etc.).

Resource Considerations

- Practical developmental considerations (technology, authoring tools);
- How to deliver accessible eLearning (platform considerations); and
- Organisational investment and support requirements (resources, skills, financial).

Appendix 1. Case Studies

Increasing student reach and inclusivity through Massive Online Open Courses

Chris Gerrard
"Archaeology and history of the battle of Dunbar in 1650"

Rebecca Gowland
"Forensic Archaeology and Anthropology"

Durham University strives to reflect ambitions of cultures from around the world. Pre COVID-19, the university designed 2 x Massive Online Open Courses (MOOCs) using the Open University's FutureLearn online platform. These archaeological and heritage courses have had over 29,000 virtual participants from more than 147 countries, including many with physical disabilities. The MOOCs have increased access to historical and archaeological findings, and supported authors in delivering accurate representations of history.

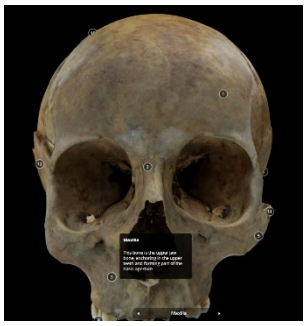
The Challenge: Short, in-person courses tend to attract small numbers of students with existing and direct study links to a study area. As an example, Durham University's 'Forensic Archaeology and Anthropology' course was a practical four-day programme with field and lab work, aimed at forensic practitioners such as police, CSIs and practitioners from the International Committee of the Red Cross (ICRC). Whilst people came from different parts of the world, the course ran with just 15 in-person students a year on average, and many were excluded due to language, visas, physical, travel and cost barriers.

The university therefore wanted to increase accessibility and availability of the course across the globe to better support practitioners and break down barriers to taking part. Chris Gerrard was also driven by his passion to open up the story of the Battle of Dunbar to a wider audience and promote the greater social relevance of archaeology as a whole beyond the university community.

The Solution: A MOOC was developed over a few months for each course, then hosted on the Open University's FutureLearn online platform, designed to ensure availability and accessibility for large numbers of students. Courses were free to access (with an optional paid-for Certificate), last 6-8 weeks and take around 2 hours per week to complete. Plenty of content variety was included, all

linked through a strong narrative arc from beginning to end. Chris took a 'detective' approach, encouraging students to uncover the mystery of archaeology and history behind the Battle throughout the course.

Each student completes a series of 'micro-steps' each week, with tasks carefully designed to be completed in lunch hours wherever possible. A mixed media approach was also adopted, including written content, audio, video, original documents and maps to decipher, 3D graphics, 3D digital scans*, with reflective, written activities, quizzes and additional resources and links to further reading to support all student levels. Tutors were available to respond to comments and chat.



*A 3D, annotated digital scan of a skull, developed for Rebecca's MOOC

A multi-disciplinary approach was embraced, intertwining history, archaeology, historical geography and the creative arts, designed to keep learners engaged and appeal to a wider audience. Courses were promoted in a variety of ways, including via Durham University's social media channels, exhibitions, email signatures and articles, and through FutureLearn's own marketing channels which proved extremely effective in reaching previous learners.

The Results: The success and impact of both MOOCs have been phenomenal, including:

- ✓ **Average 4.8 out of 5-star reviews** from learners;
- ✓ Huge increase in student participation in the first year, from an average of just 15 in-person, to a combined **29,362 international students** from **147 countries;**
- ✓ Significant EDI impact, with positive **inclusive representation** across gender, age, social and disability groups. The course was accessible and available to many who, due to physical, financial and social challenges would otherwise have been unable to attend;
- ✓ The content has **supported remote training** throughout the pandemic by US colleagues;
- ✓ The Certification revenue received by the University can **help fund resources** to support the running of the course further;
- ✓ Encouraging six authors to **accurately represent history and archaeology** in their novels.

"There is a huge public appetite for heritage-based MOOCs. There is such an enthusiasm out there! The UK has a global reputation for archaeology and heritage – you'd be pushing on an open door, and people would engage with them." **Rebecca Gowland, Durham University**

Lessons Learned: Conversion of face-to-face practical courses into a digital learning experience is a challenge. This makes it important to find ways of keeping learners engaged via a mix of engaging resources – including photographs, 3D scans, instructional videos and audio.

- **Set aside proper time and resources:** This applies to both creating, developing and running a MOOC;
- **Involve learners upfront**: Set expectations, let learners know how much support (if any) you can offer, encourage them to interact and be mindful of different time zones;

- **Bring in the right technical expertise** – Think about animations, film, high quality graphics and illustrations, music and try to gather those creative skills together. Digital technology is important for creating varied and engaging content, but this does require expertise, so plan this in to your budget and time.
- **Use quality footage of events when they happened**: Record video footage of sites and excavations to use as content that is less static that photographs. If you don't have any live footage, think about other ways to make the narrative less static and as relevant as you can
- **Choose your topic and audience carefully**: FutureLearn will only support MOOCs which have broad appeal – it can't be too niche or pitched at a specific level. Remember - you are the story-teller.

"The heritage sector is not well served by MOOCs – there is a real gap here. With the right team, it would be possible to quickly develop some standard MOOCs which would fit firmly within Historic England expertise and interests, particularly around standing buildings,* well-being and heritage and current initiatives like Heritage Action Zones. All these *would be very well suited to MOOCs." Chris Gerrard

"FutureLearn encourages a structured format and short bitesize pieces of content, interspersed with discussion and activities so it's not a passive learning experience." Rebecca Gowland

FutureLearn is a British digital education MOOC platform, jointly owned by The Open University and SEEK Ltd. As of June 2020, it boasted 175 UK and international partners, including non-universities.

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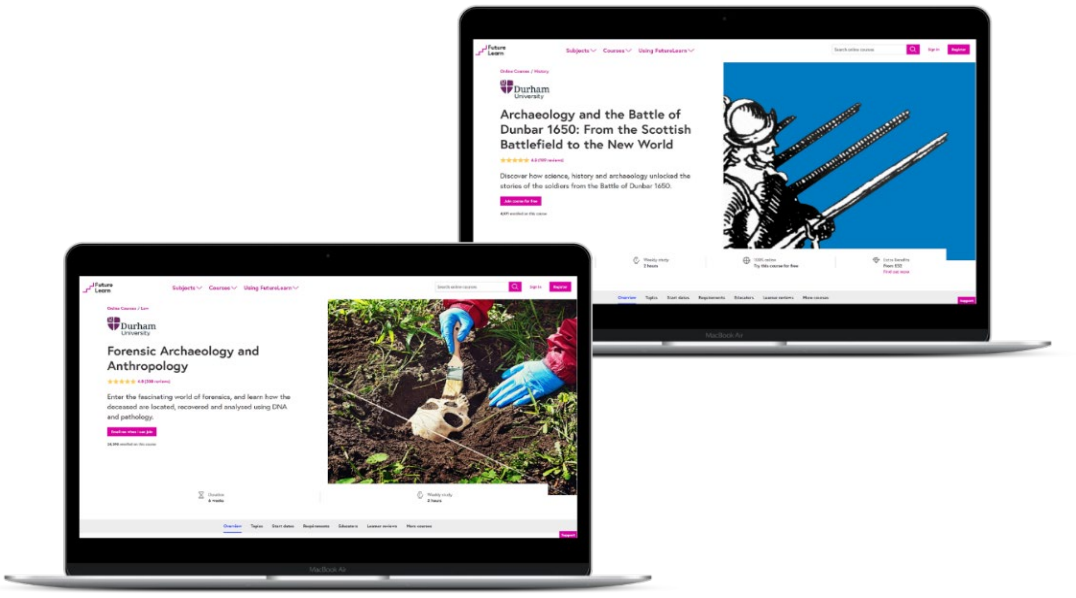


Virtual learning for practical lessons

Teaching and building conversation between students, and being able to teach those sector skills that site visits and practical work traditionally provided whilst dealing with virtual and social learning constraints.

Dr Louise Cooke
Lecturer in Conservation

Dr Helen Goodchild
Project and Fieldwork Officer

The Challenge: A key challenge for the Archaeology Department was 'flipping' teaching so that students could still undertake practical work whilst dealing with virtual and socially distanced learning necessitated by COVID-19. First-year students in particular were due to carry out invasive excavations just at the point when lockdown started, which impeded their ability to work on site. For Dr Helen Goodchild, this meant thinking quickly about using technologies in a way they hadn't done before. Meanwhile, as Dr Louise Cooke points out, staff had to consider what the next 12-months of teaching and project activity would look like.

In terms of specific technologies, the university has embraced Padlet[64] software as a collaborative space which helps conversations to develop between students and staff. Meanwhile, ArcGIS StoryMaps[65] allows information to be packaged up where a site visit would have been traditionally used. In one example, teaching geophysical survey, a virtual StoryMap tour around York's Museum Gardens was created where, as well as looking at the history of the landscape, students were asked to project plan a survey of the area with a fixed budget, taking into account the history,

[64] Padlet is a digital tool that can help teachers and students in class and beyond by offering a single place for a notice board.

[65] ArcGIS StoryMaps is a story authoring web-based application that enables users to share maps in the context of narrative text and other multimedia content. Stories can include maps, narrative text, lists, images, videos, embedded items, and other media.

environment, and future development plans of the area, feeding back their rationale via Padlet for later live discussion.

The Results: Padlet has allowed students to collaborate upfront and frame discussions in a productive way. Looking at students' assessments, they are now thinking about things in a much more critical way. Dr Goodchild has witnessed students gain a broader range of experiences that they would not previously have had. The focus away from data capture meant more time could be spent on critical aspects such as processing, interpretation, and communication. The use of Padlet has also allowed students to dive deeper into an activity than if they had been walking around a site. Informal feedback has been positive and first year students have been really enjoying their virtual field trips.

"In some ways, though students may have been disappointed with not having the hands-on experience, in retrospect they've had more exposure to a wider range of teaching and greater breadth of experiences." Dr Helen Goodchild, University of York

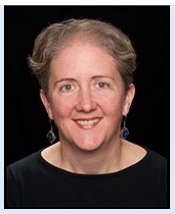
"On reflection, our students now have a varied set of skills. Group work in person requires a very different approach to group-work virtually and I feel they now have a more developed set of professional skills. A challenge for the future is how they use that different set of skills in the sector when they graduate" Dr Louise Cooke, University of York

Lessons Learned: For Dr Goodchild, teaching with a social distance has given the Department space to develop virtual learning experiences that they hadn't tried before. At first, students were at risk of being overloaded with new technologies but that has been addressed, so it's about resisting the temptation to squeeze in "just a little bit more". As Dr Cooke points out, Padlet was initially over-used, which became overwhelming. That has now been streamlined and students followed that journey so they felt part of the changes.

The department now leaves space for critical discussion and recognises that design of virtual learning needs consistency to help students navigate around packaged-up content. In the future, the university would like to continue using pre-recorded lectures, use of Padlet and virtual site visits but review how those are combined with in-person teaching and practical activity in a more blended way.

Use of Virtual Labs for Artefact Exploration

Adapting to teaching in a pandemic, the Department of Archaeology introduced virtual 'live labs' to bring museum objects to life and encourage students to interact with the past.



Dr Emily Williams
Associate Professor (Teaching)
Department of Archaeology

The Challenge: As part of Durham University's Master's degree in Museum and Artefact Studies, students are assigned two objects over the course of three terms to study, draw, photograph, analyse and report on. This involves telling the story of the objects, including how they were made and used, along with the surrounding social context. However, COVID-19 restrictions in 2020 created the problem of how students could gain access to and interact with objects sourced from museums.

The Solution: Associate Professor, Dr Emily Williams moved the artefact studies class online and ran one-to-one lab sessions with each student using photography and analysis from objects sourced the previous year. Prior to conducting Zoom sessions, students were provided with high resolution digital images and pXRF analysis. Over Zoom, Dr Williams used a Dino-lite USB microscope to show each student their assigned object, encouraged them to ask questions and – in Dr Williams' words – "use me as their hands." Students had the opportunity to follow up these sessions by requesting additional analysis such as X-rays, UV photographs or further pXRF analysis, which were sent to them via email.

The Results: Students were excited to have access to their own object, which gave them a real sense of ownership. Having access to high resolution photos of the objects taken from several angles was also important as it allowed the students to keep looking at their object. A notable limitation was that the students struggled to get a sense of 'monumentality' due to not being able to handle the objects themselves, for example, they weren't able to fully appreciate aspects such as weight and texture. It also proved quite time-consuming, with the usual three-hour session taught in the lab translating into more than 20 hours of online one-to-one sessions.

"It's important to give students a lot of space to develop the skill of learning to look at an object, especially when working remotely." Dr Emily Williams, Durham University

Lessons Learned: Dr Williams determined that the Dino-lite microscope worked better on smaller objects such as Egyptian beads compared to larger objects. Furthermore, a visualiser would have been better to use on larger objects, but it was not available in time. If following this approach again, Dr Williams would consider doubling students up with an object or putting three students together in a team to reduce the amount of extra teaching time.

David PARR HOUSE

How their virtual tour achieved so much more than simply keeping David Parr House afloat throughout the pandemic

When David Parr House closed their doors due to the pandemic in 2020, they developed a virtual tour which has already had significant impact for the charity.

Charlotte Woodley
charlotte@davidparrhouse.org
Pilgrim Trust Curator
David Parr House

The Challenge: Since opening in 2019, David Parr House, a small heritage organisation in Cambridge, had been fully booked for physical tours until the COVID-19 pandemic meant the house had to close.

The Solution: Having received some funding from Historic England, David Parr House saw an opportunity to develop a virtual tour for visitors, to sustain a revenue stream, continue to give visitors access to the house, and keep volunteers and staff involved throughout the pandemic.

A virtual tour seemed like a good way of using the resources they had gathered over the years, including videos of the conservation process and audio memories of house neighbours and family.

Virtual tour guides greet visitors on Zoom and introduce them to the house. Visitors are then given a personal, guided, hour-long tour, with a Q&A session at the end. Following the tour, visitors have access to an online 'Explore' platform for 48 hours, where they can explore 2-3 hours of additional content via 103 hotspots of the house, including conservation videos, audio memories, sounds of the house, photographs, documents.

The Results: The tour has had many positive results for David Parr House, including:

- **400% increase in tour capacity,** from eight (for physical tours) to 40 for virtual tours;
- **Extended reach and inclusivity**, with the tour attracting many new people including international visitors, those with mobility issues, and larger educational, corporate and private groups;
- **Flexible tour times**, with five tours a week delivered at different days and times, including weekends and evenings, attracting a wider and international audience;

- **Large revenue increase,** enabling the House to not only stay open throughout the pandemic, but generate additional income well after the house re-opens;
- **Increased digital skills,** offering not only organisational benefits, but wider social impact too, with some volunteers and staff now better able to virtually connect with family and friends via Zoom;
- **Expanded digital delivery** via specialist tours, including paint conservators and specialists, and recruitment of staff to provide additional digital support into other areas.

"We now have a House tour which is accessible for international visitors, for those with mobility issues, and for school groups – people who would never have been able to visit before due to the size and fragility of the House." **– Charlotte Woodley, David Parr House.**

Lessons Learned:

- **Training and support has been essential:** 18 out of 21 volunteers were very enthusiastic to embrace new technology and become virtual house guides, so David Parr House offered two-hour training sessions, followed by one-to-one support which has worked very well;
- **Making best use of existing resources:** When developing the virtual tour, David Parr House played to their strengths and used existing content on the House for a head start, before developing new resources;
- **Keeping volunteers involved:** Encouraging volunteer ideas and feedback throughout the virtual tour development process helped to ensure a smooth visitor experience;
- **Partnership working:** Working closely with the Matterport[66] platform provider, Venue View, helped to adapt the technology to best suit the heritage market and tailor its applications.

"Matterport was a very financially manageable platform for us. I would definitely recommend it to other heritage organisations." **– Charlotte Woodley**

[66] Matterport is an online platform for 3D space capture and collaboration: https://matterport.com/en-gb

Incorporating Virtual Reality (VR) into the museum space

Live Borders invited visitors to the Jim Clark Motorsport Museum to sit in the driver's seat and experience the life of motorsport champion Jim Clark through VR. This brings some interesting potential lessons for e-learning.

Jane Hogg
Commercial Director
Live Borders

The Challenge: The Jim Clark Motorsport Museum opened in Duns, Scotland in August 2019 to showcase the life and racing career of Jim Clark. Live Borders identified a need to convey the dynamism and excitement of motorsport by giving a 'hands on' experience that would not otherwise have been possible with a traditional static exhibition of medals, trophies and other memorabilia.

The Solution: The Assistant Curator and Education and Engagement Officer researched the possibility of incorporating a Virtual Reality (VR) headset into the exhibition. Working with the Lotus heritage team, the interactive VR experience invited visitors to hop into the driver's seat themselves and experience Clark's races.

The Results: Jane Hogg, Commercial Director for Live Borders, describes how the exhibition was well received by visitors of all ages who were happy to pay a bit extra for the VR experience.

"It was a double hit. Although there was one person in the car, it was a great pleasure for people to watch someone else do the VR via a shared screen."

This experience had a positive economic impact as visitors were more inclined to stay in the area for longer and use other facilities. Jane praises the museum staff for embracing digital technology – not easy since in her experience the curatorial and museum mindset is traditionally analogue. VR therefore provided a great way of introducing latest technologies into the museum space.

Lessons Learned (that would also apply to VR for eLearning):

- Digital technology can be immersive but expensive, so may benefit from a sponsor or collaborator. As Jane found, her sponsor was keen to have strong involvement in how VR was integrated into the exhibition, resulting in a longer time to launch;
- Digital technology inevitably has teething problems. This was no exception in Jane's case so she would recommend a soft launch before rolling it out;
- VR headsets can bring design and accessibility issues for some visitors;

- COVID-19 restrictions can affect the use of such technology (as Jane found, COVID-19 meant the VR headset had to stop being used, but the team is now working on a safe and manageable solution).

THE INSTITUTE OF CONSERVATION

Accredited assessments online

In response to COVID-19, Icon has discovered new ways of assessing candidates and growing their global membership base without the need for face-to-face meetings.

Patrick Whife
Training & Development Manager
Icon

The Challenge: Icon is a leading professional body for restorers and conservators. To become an accredited member, practitioners would usually present and discuss evidence with Icon assessors face to face. However, in light of COVID-19 restrictions. Icon therefore had to find a new way of enabling accreditation professional assessments to continue.

The Solution: Icon moved the process online with assessments taking place virtually via Zoom or Microsoft Teams. Patrick Whife – Training and Development Manager at Icon – found smartphones to be a great way of showing assessors an object during the assessment, although there can be some issues with lighting, balance and connectivity. So far, seven virtual assessments have taken place this year with another 14 scheduled. Once completed this trial will be fully reviewed before it is more widely adopted.

Photo: Matt Wreford

The Results: This process has been well received by candidates and assessors and has avoided the risk of a backlog that might otherwise have occurred. Furthermore, remote assessment opens up the process to restorers and conservators across the globe, with candidates now being assessed in Australia and the USA. Previously, face-to-face assessments were mostly undertaken in the UK so Icon has the potential to really grow its membership.

"This is a great opportunity for Icon as we are one of a small number of bodies globally that offer professional accreditation in this way." Patrick Whife, Training and Development Manager at ICON

Lessons Learned: Patrick makes the point that Icon are keen to continue using remote assessment, particularly for conservators based outside the UK. This means identifying criteria for best practice (for example testing technology before an assessment) and producing advice and guidance for both assessors and candidates to boost confidence.

"Assessors and our accreditation committee need to feel confident that an assessment delivered remotely is of equal standing and rigour as something that has taken place face-to-face. I feel confident it is. Our challenge is to bring other members involved along with us." Patrick Whife, Training and Development Manager at Icon.