

**Themata 3**

E-learning Archaeology, Theory and Practice

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# E-learning Archaeology, Theory and Practice

*Heleen van Londen*

*Marjolijn S.M. Kok*

*Arkadiusz Marciniak (eds.)*

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## Introduction *Arkadiusz Marciniak*

### *E-learning – a short overview*

The digital age we all live in is inhabited by omnipresent multimedia technology and the internet. They triggered a revolution in the way knowledge is produced, transferred and communicated within the communities of specialists and the general public. All these groups are increasingly being exposed to new methods of learning and this is reflected in their demands for more flexibility in the way they are taught. This was first manifested by using increasingly developing electronic resources to underpin traditional methods of knowledge acquisition. Numerous Web links to empirical materials as well as the publishing of course materials such as pdf documents or PowerPoint presentations are now the norm. Later, communications can be added in the form of simple email or online discussions. However, these methods of transmitting knowledge has numerous shortcomings to students, specialists and the public alike. E-learning attempts to offer the tools and methodology to overcome these intrinsic limitations and to help in producing and communicating systematic knowledge to different constituencies (e.g. Belanger & Jordan 2000; Clarke 2007; Mischke 2005).

E-learning is a very broad category. It is defined as any type of learning environment that is computer enhanced and supported by multiple computer and online multimedia technologies. These involve in particular the Internet as well as other electronic media such as cd-rom, interactive tv, intranet, or extranet. The process of learning is independent from the time and place and the trainer and student are bridged through the use of these technologies. It is sometimes referred by the lay person to as 'distance learning', 'online learning' or 'virtual learning'. These are certainly not synonymous as they refer to different ways and means of content delivery at a distance using various technologies (see Collison *et al.* 2000; Horton & Horton 2003; Hyla 2009).

E-learning has a long and rich history. The technologies used in this environment originate directly from more traditional modes of learning at a distance. They have been increasingly developing and improving reaching its current and most advanced form by being communicated by the Internet,

the omnipresent multimedia technology. Computers were introduced to the learning process almost from the beginning of their existence. As more and more personal computers became available, the idea of online learning was put forward. At the end of the 1990s the learning management systems (LMS) were implemented making the possible emergence of such solutions as web based training solutions.

The emergence of these new computer and online technologies and their application in the domain of education mark a new era in distance learning. More traditional forms of learning and training are systematically supported, and often replaced, by these new technologies facilitating faster, more efficient and usually cheaper means of distance education. Different forms of distance learning are now dynamically increasing in public institutions as well as at schools, colleges and academic institutions across many disciplines. As indicated by many examples, e-learning has proved to be one of the best methods leading to competitiveness among companies in the knowledge based economy.

E-learning education is of a universal character and can be used and directed to a wide audience. As indicated by previous studies, these are the most enthusiastically used by working professionals with a lack of time for participating in traditional training and/or working in remote geographical territories, individuals living and working in towns and villages far away from education centres, disabled people, the unemployed, and individuals interested in getting various certificates offered by e-learning course providers.

E-learning is supported by multiple computer and online multimedia technologies (see also Pluciennik in this volume). The following types of e-learning can be distinguished depending upon the methods of didactic material acquisition: (1) Computer-based training (CBT), (2) videoconferences, and (3) Web-based training (WBT), and (4) Mobile learning (M-learning). There is no room in this short introductory paper to discuss the details of all of these solutions and to compare their benefits and shortcomings. The two first solutions are relatively simple. CBT refers to the production and distribution of didactic material on cd-roms. Videoconferences make it possible for people in two or more locations to see and hear each other at the same time. It requires software making it possible both for audio and video streams to be coded and decoded (Carliner 2002; Horton 2006).

The increasingly popular WBT is a sophisticated approach to distance learning in which training is delivered by the Internet or intranets and is an

ideal media for reaching trainees anywhere and at any time. Its use does not require any other additional software except for a computer with online access and a moderate internet browser. The training content is placed on the specially designed e-learning platform. The implementation of online technologies makes it a much more efficient e-learning method as compared to computer-based training.

The WBT course is explicitly designed to be placed on the Internet and provided by the LMS/LCMS multi-user environment making it possible to create, store, manage, and deliver a digital learning content. It is usually written in an XML-based framework known as SCORM (*Shareable Content Object Reference Model*) a standard making it possible to share learning objects among different learning management systems. This facilitates its further transfer between LMS/LCMS systems of different producers making it possible to multiply the use of the training content. As regards the role of the trainer, the means of acquisition of didactic materials as well the communication methods among a group of trainees, one can distinguish two major types of WBT training. These are comprised of self-training and training supported by the instructor (Driscoll 1998, Horton 2000).

The content of e-learning courses should be communicated using different media including text, voice and sound. The efficiency of training directly depends not only on the quality of training materials but also on interesting and stimulating presentations. E-learning courses are characterized by a number of functionalities making it possible to exchange learning materials, do tests, communicate with each other in many ways, track and trace the progress, etc.

#### *E-learning in archaeology – on outline*

These innovative methods of education have been occasionally implemented in archaeology proving that they have the potential to raise standards of teaching and training various aspects of the discipline. In this chapter I intend to briefly discuss the major developments and achievements of the e-learning application to date. This overview does not intend to systematically present these applications and there is no consensus what e-learning in archaeology is and what it is not. Particular users define it in a significant manner.

Having all these terminological problems in mind, a representative picture of e-learning solutions in today's archaeology seems to be provided

in the session 'E-Learning in Archaeology' held at the 'Computer Application in Archaeology' conference in early 2009 (CAA E-Learning in Archaeology Session 2009)

The majority of the papers referred to the application of M-Learning solutions. Angharad Williams of the Royal Commission on the Ancient and Historical Monuments of Wales reported on the Royal Commission project and focused upon the use of mobile devices to teach the general public about the Welsh historical environment. Using GIS, GPS and mobile technology they are set to deliver information and audio-visual resources of local heritage outside museums or heritage sites, making it possible for their individual exploration.

Learning resources for mobile devices accessible to undergraduate students 'in the field' are being developed at the University of Sheffield. Bob Johnston and Graham McElearney presented a project that was carried out at the University of Sheffield to develop the use of mobile devices focused upon numerous field skills in both undergraduate and postgraduate teaching and learning in archaeology. In a similar vein, Andrew Folkard reported on a pilot project on the production of providing multimedia virtual alternatives to field trips. The observation and measurement undertaken on a field trip is replaced by videos of the field trip and presented in the form of a multimedia package combining GIS along with theoretical and historical information.

Similar results are achieved by the use of podcasts that can take on a number of forms including audio-only, enhanced audio (i.e. sound with still images), or video. Alan Greaves of the University of Liverpool reported on a number of case studies for the use of podcasts to support learning and teaching in different aspects of archaeology. These were comprised of recordings of lectures (audio-only), audio-only podcasts for use on fieldtrips, enhanced-audio skills podcasts, and Interactive Quick time VR and audio soundtrack. The availability of user-friendly software packages and hardware make the production of such digital resources increasingly easier.

E-learning can also comprise exploring the pedagogical potential of Second Life for teaching spatial theory in archaeology. The most advanced pilot projects have been carried out at the University of Leicester (see below) and the University of California at Berkeley (Okapi Island in Second Life 2009).

The current state of e-learning development in archaeology has also been summarised in the recently published book *E-Learning Methodologies and Computer Applications in Archaeology* (2008) edited by Dionysios Politis.

It presents a range of applications of e-learning solutions in education in archaeology. The book divided into four sections including *E-Learning Technologies; Strategies, and Methodologies; Spatial-Computational Technologies and Virtual Reality Reconstructions in Archaeology; Electronic Publishing and Copyright Protection* followed by a section presenting a range of interesting case studies. The first part aimed at discussing such issues as open and distance learning tools, teaching and learning in virtual environments or the emergence of e-learning 2.0. The second part is only very generally related to e-learning as it is focused upon virtual reconstructions, virtual museums, the use of expert systems or machine translation systems. The third part covers a range of issues related to publishing such as the legal issues of electronic publishing in virtual environments or electronic forums.

A significant field of the e-learning application in archaeology are distance courses offered by academic institutions. A number of e-learning courses is offered by The Subject Centre for History, Classics and Archaeology which is part of the Higher Education Academy, institution that supports teaching and learning in UK higher education. They are aiming at enhancing the quality of teaching and learning in archaeology.

One of the Subject Centre's initiatives is the project 'The Evaluating Multiple Interpretations Generative Learning Object' (EMIGLO) intended to create a generative learning object for the humanities (Okell 2008). It is in the form of a fully editable e-learning tool creating an on-line tutorial made of students' own empirical material supported by a range of file type such as jpg, .txt and .mp3 format and making it possible for their manipulation. Its purpose is to familiarise students with a range of interpretations, test their understanding of details, similarities and differences, and facilitate their own critical interpretations. As a result, students become critical interpreters in the context of explicitly applied theories and methodologies.

Another project entitled 'Using Images in Teaching History, Classics and Archaeology' is aimed at producing a web-based tutorial to efficient and context-specific using images in teaching practice (Using Images in Teaching History, Classics and Archaeology 2009). It will utilise resources from, for example, the Borthwick Institute Archive at the University of York and the Archaeology Image Bank. Equally interesting is the Drawing and Recording Skills in the Archaeology project. It is intended to elaborate tools facilitating student skills in archaeological drawing and recording.

The most elaborated e-learning program in academic archaeology is

offered by the School of Archaeology and Ancient History, University of Leicester that has been running since 1997 (Distance Learning Course 2009). It offers a two year long distance learning MA in Archaeology and Heritage and an MA in Historical Archaeology for students from all over the world. Each MA comprises four taught modules and a 15,000-word dissertation. Each module lasts for 15 weeks. These are the following modules for the MA in Archaeology and Heritage: Landscape Archaeology; Classical Landscapes; Planning and Management of Archaeological Projects; The Archaeology of Standing Buildings; and an Interpretation and Presentation of Archaeological Heritage. As regards the MA in Historical Archaeology the modules are: Doing Historical Archaeology; Archaeology of the Modern World; Historical Archaeology of England; Classical Landscapes; and The Archaeology of Standing Buildings. All these modules are also available as Postgraduate Certificates (with a shorter 7,500-word dissertation). PhD research degrees by distance learning are also available. There are currently over 120 students registered for our postgraduate courses, and more than 100 students have now graduated with an MA, and a number with distinction (see also Pluciennik in this volume).

*E-learning in archaeological heritage – a case of 'Archaeological heritage in contemporary Europe' a course*

This book is another contribution to a growing body of e-learning applications in archaeology and archaeological heritage. Its main aim is to discuss various facets of the Leonardo da Vinci project *E-learning as a tool of knowledge transfer in the field of protection and management of archaeological heritage* completed during 2007 – 2009 by six European partners in the context of other undertakings in distance learning solutions in archaeology over the last few years. The e-learning solutions implemented in the project were carefully designed taking into account the peculiar character of archaeological heritage as well as the nature and dispersal of the target group. As one of the first undertakings of this kind, its various aspects need to be thoroughly discussed to identify its benefits and failures and more generally to identify the various pros and cons for the development of e-learning in archaeology in the future.

The book is composed of eleven chapters. Seven of them refer directly to various facets of the project such as its design, methodology, implementation, and evaluation. The remaining four contributions discuss current initiatives in implementing different distance and e-learning solutions in archaeology.

The first chapter written by Mark Pluciennik and based upon his long-lasting experience, debates extensively the benefits and failures of distance learning and e-learning as well as pressures for convergence between them as well as between e-learning and traditional learning. For the author e-learning is certainly not a substitute for other ways of education. On the contrary, it is a complement mode of content delivery, which in places proves to be the most efficient one. However, it is clear that not all learning can be done through digital presentation, video or the manipulation of processed data. This is especially so in the discipline such as archaeology where one has to learn a range of practical and embodied skills directly through doing tasks such as : finds processing, assemblage analysis, surveying or excavation. If we choose to implement e-learning solutions, however, it is necessary to provide a serious structural, resource and staff support being a prerequisite for supplying and maintaining high-quality and up-to-date education.

A block of the project's based papers begins by Arkadiusz Marciniak's overview of the project. The project's explicit objective was to exchange the best practices and innovative solutions in the field of the archaeological heritage of northern Europe. In particular, its major purpose was to design, develop, test, assess and implement web based training solutions in developing and upgrading vocational skills in this sector by preparing and conducting a multimedia e-learning course composed of fifteen interrelated modules. Furthermore, the project developed and implemented new methodology including the transfer of knowledge from the conventional to the e-learning format and the elaborated training methodology.

The latter aspect is carefully presented in the paper written by Jacek Marciniak. The course was designed, produced and implemented taking into consideration the needs and time constraints of archaeological heritage professionals comprising the major target group. The paper discusses in detail the models and methods of distance training and their applicability for the sector of archaeological heritage and tools used in the distance learning process, use of multimedia, learning management systems supporting conducting distance learning, in particular the LMS/LCMS system's functionality as well as details of the course's preparation and implementation and details of the training process.

An important part of the book comprises papers aimed at evaluating the course content as well as the training process. Papers by Agnieszka Chwieduk, Katarzyna Marciniak, and Andris Šne are based upon careful and systematic

questionnaires that were collected among trainees in all participating countries after the completion of the course. The questionnaire consisted of 67 questions. For the vast majority of trainees, it was their first contact with this innovative method of vocational training. Overall, both the course and the training were evaluated very highly. Most of the participants learned a great deal of current and actual issues and themes in the archaeological heritage sector in Europe and which were believed to be of use in their professional work. Interestingly, the international character of the course was treated as a clear asset. The best aspect of this training method was its flexibility regarding the time and the place of learning. The least positive opinions were regarding teamwork. The technical side of the course was highly valued.

In the paper by Anders Gustafsson and Håkan Karlsson, the authors compare the results of the training of the course *Archaeological heritage in contemporary Europe* with the course *Archaeology. Introductory course* that has been conducted for some time in the Department of Historical Studies at the University of Gothenburg, Sweden. Despite the differences between them in terms of their objectives, length, focus, depth, and expectations, the experience of both courses make it clear that e-learning solutions in archaeology can be a significant asset in disseminating archaeological content among professionals and the public alike.

Monique H. van den Dries in her paper provides a thorough and detailed evaluation of the course from a personal perspective as one of the trainees. Being a heritage professional herself, she explicitly addressed various aspects of the training from the point of view of its major target group. She stressed in particular a high quality of the course content, methods of its delivery as well as its usefulness for the heritage sector. A number of thoughtful points on the future of e-learning applications in archaeology were also formulated.

A paper by Marjolijn Kok is written from the personal perspective as an author of some training modules as well as a teacher. She discussed in particular her experience with teaching in the condition of no direct interaction with students. Her overall positive evaluation of the course was that she found the teaching itself as an alienating experience as it lacked direct contact because it is essential for this kind of experience. The general usefulness of this method of content delivery is arguably context specific and it is better suited for the dispersed target group and seems to be less efficient in the case of academic education.

In the paper by Alvaro Arrizabalaga, Maria José Iriarte and Rosa Martínez, the authors present an interesting ongoing e-learning programme in archaeology implemented by the Aranzadi Science Society (Spain) and called it the Arkeonet. It is aimed at presenting the programme's objective as well as the training methods and applied tools. It further presents a detailed description of the programme's content in relation to the group of trainees. Kenneth Aitchison in his paper discusses e-learning application in a transnational project *Archaeology and Construction Engineering Skills (ACES)*, funded by the European Commission's Lifelong Learning Programme under the Leonardo da Vinci II strand. The ultimate learning materials that the project produced was e-learning. The paper discusses development of learning materials that has gone through a process of reviewing best available practice and then using this information to produce 'handbooks' of technical advice later converted into e-learning format.

#### *Concluding remarks*

E-learning in archaeology is a relatively new domain. Its potential has hardly been explored and assessed. As shown by the examples presented above, it is understood very broadly and difficult to estimate which of its applications are prevailing at present and how its various facets will develop in the future. However, all of the major types of e-learning such as computer-based training, videoconferences, web-based training, and mobile learning are clearly present in archaeology and archaeological heritage. The experience of the course 'Archaeological heritage in contemporary Europe' as well as many experiments and pilot studies in e-learning in archaeology and archaeological heritage make us sure that we are experiencing the development of a new and still relatively unexplored approach to teaching in archaeology.

E-learning has numerous advantages. It is results oriented, versatile, and cost effective. In terms of web based multimedia courses, it offers good training content. It forces teachers to thoroughly rethink it before hand and present it in a systematic way. Furthermore, it is presented in an interactive way comprising text, graphics, animation, sound and video. The course content can easily be modified and updated. Students can study the course content in short segments. They have direct links to auxiliary materials in the form of attached files and electronic resources available on the Internet.

E-learning allows students self assessment so they can test their own progress with the course. At the same time, trainers can easily monitor the

training progress of particular participants, identifying emerging problems and providing necessary support. E-learning training is very flexible. It can reach geographically dispersed students. All materials can be accessed at the most convenient time in many ways depending upon individual time schedules. This refers to a non-sequential use enabling students to navigate content in different ways, or obtain a general view before getting into the details of the course's individual segments and provides constant access to reference and revision material. The course offers suitable and easy contact with other trainees creating an interactive and stimulating environment. The trainees will also learn to work together in a collaborative manner. At a certain scale, e-learning is cost effective making it possible to train a large number of students at the same time. However, the costs of the production of e-learning content are high.

There is no doubt that e-learning is devoid of drawbacks and failures. The teacher has no direct access to the students that make the training a somehow alienating experience. Any skills that rely on inter-personal contact cannot be satisfactorily acquired in this way. Learning at a distance requires self-discipline and good personal time management, which means they can be satisfactorily achieved only by highly motivated individuals. The course is also restricted to people with access to a computer and/or appropriate browser. Clearly, limited IT skills may also be prove to be a restricting factor.

These advantages and disadvantages are clearly not a universal character and are evidently context specific. Hence, while in some contexts these solutions are clearly beneficial in some others it can prove to be inefficient. The experience of both teachers and students in the course 'Archaeological heritage in contemporary Europe' make it clear that advantages largely outnumber disadvantages, as discussed in detail in this volume. I would argue that the course and experience gained during its preparation and running will prove to be very useful and beneficial for the development of e-learning in archaeology in the years to come.



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