

Themata 3

E-learning Archaeology, Theory and Practice

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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 is 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 types 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 efficiently and context-specifically use 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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01

Education and e-learning in archaeology. Teaching materials in a virtual world *Mark Pluciennik*

Introduction

This paper was written for a conference about E-learning and Archaeology: so a specific medium and a specific discipline. But it has been or will be presented in different media, oral and digital; and of course the whole topic as well as this paper sits within many wider contexts – of pedagogy, of economics, of capitalism and globalisation, of anthropology and sociology and the ways that technology can promote and subvert various agendas, including those within education, and many of which come under the rubric of ‘flexible learning’. So I would like to start by thinking a little about those wider contexts and concepts. Let me also situate myself by saying that in my institution my role is that of a Director of Distance Learning (in archaeology and ancient history), not e-learning, and so this paper spans the two. What I am convinced by, at present, is that e-learning is not the same as distance learning (though it can be), and distance learning is not entirely e-learning, though again it can be. What I also want to propose is that there are dangers, as well as benefits, in conflating the two. Further, although there are many benefits to e-learning,

I also want to argue that the pressures for convergence between not only distance learning and e-learning, but also between e-learning and traditional, face-to-face learning that we are seeing at many universities, are not always and invariably good, and sometimes need to be actively resisted. Finally, I shall suggest that while a key characteristic of the developing educational world is complexity, organisational support sometimes lags behind the needs of those producing, delivering, supporting and expecting new forms of learning.

Chronologies and practices of learning

It is generally accepted in contemporary educational theory that much effective learning is not a case of simple knowledge transfer from teacher to student as though ‘knowledge’ were a collection of facts equivalent to a material object, to be transferred from one brain (the teacher’s) to another (the student’s), whether individually or collectively. Rather, learning should be active rather than passive, and often works best when thought of as a form of engagement, whether with ideas, or materials, or practices; and often co-operatively too in dynamic learning situations as ‘communities of practice’ (e.g. Bird 2001; Lave & Wenger 1999; Russell 2002; Thorpe 2002; see also Burke and Smith 2007 for application of these ideas to campus-based teaching and archaeological theory). On the other hand I do want to acknowledge that sometimes, for all of us, we do want ‘facts’, or ‘words’ or images: we want to learn or check what the legislation says, what the form of that pottery vessel is, the distribution or location of these sites, what’s available or local practice elsewhere... This is part of what the internet has become for many of us: a giant database, a repository of potential information, and a way of searching it as, or instead of, a library in a way which means that we don’t have to bother about where we enter it or where the information is stored. But what is exciting about many current technologies is that they can enable new or differently-emphasised ways of learning, forms of participation and collaboration, as well as more traditional exploration and absorption, for a whole range of groups who are otherwise dispersed in space and/or time.

E-learning can also be usefully considered as just one facet of a more general shift towards a more general ‘flexible learning’. The information and communication technologies available to us all have one thing in common (just as print technology does!): they allow non-co-present communication. Typically for the traditional print medium the communication is individually received and understood (read!), and perhaps physically responded to, at a time of the recipient’s choosing: it is an asynchronous medium. The big difference in the various modern technologies is that they are easily and speedily delivered and responded to: they are or can be interactive; they often allow near-synchronous responses which can become quite close to dialogue in the traditional sense; they allow one-to-one or one-to-many or many-to-many responses. And such responses can instantly become semi-permanent records of learning which in themselves can become iterative learning resources – emails, bulletin boards, wikis, blogs for example, but also

potentially podcasts, videos, or videos from webcams and so forth. So in addition to, or between the timings of traditional methods (read this, write an essay; or listen to this and let's discuss as a group), we now have technologies which blur the differences between synchronous and asynchronous learning, teaching and participation, knowledge transfer and learning, reading, observation and dialogue. Exercises and tests can be administered and indeed sometimes assessed automatically and on-line. Images can be much more creatively and engagingly and usefully presented: pictures, maps, data sets, graphs, presentations, animations, 3D reconstructions, all of which can be interactive, manipulated, viewed differently, and themselves constructed by individual students or by synchronous or asynchronous groups in learning projects. There are perhaps four lessons from this.

Firstly, in terms of materials and teaching/learning (and the difference between those is also becoming increasingly blurred, especially in aspects of CPD), we can genuinely do more and in a variety of different, sometimes more useful and also often more engaging ways.

Secondly, there are different 'chronisms' available, by which I mean the timescales over which people (students, teachers, participants) communicate and interact. Some forms are (quasi) synchronous, but there are many which are semi-asynchronous and differently or partially synchronous for different participants – wikis, blogs, emails, texts, assignment feedback, peer review... To think about it another way, there are various ways of 'presencing' or co-presencing members of what are often called 'learning communities'. The concept of what constitutes dialogue can be both stretched and compressed.

Thirdly, there are different combinations and directions of one-many or many-many relationships which again can continuously vary in their extent, size, chronologies and dynamics (e.g. e-tivity task groups and e-moderators, (Salmon 2002, 2003), project sub-groups, virtual classrooms, observers, 'lurkers', participants...

Fourthly, all this means that especially within relatively small disciplines such as archaeology, good educational or training provision at levels above the introductory is likely to be complex, being quite highly-tailored to specific

audiences and staff – and that probably also means 'expensive', despite potential economies of scale for parts of the process.

As is well known, many of the qualities of e-learning noted above mean that it is part of, is helping to construct, and is generally seen as crucial to 'flexibility', one of the new buzz-words in contemporary politics and economics as well as education. Of course we then have to ask: flexible in which aspects? And flexible for whom?

Flexibility

There are many contested ways in which the term 'flexible' is understood. Neo-liberal governments such as those in the UK in recent decades have tried to promote and indeed enforce 'flexibility' among the workforce as a way of adapting to and competing within a globalised economy. From one point of view then 'flexibility' becomes the mantra of commercial and capitalist organisations and governments for mobile, adaptable and well-trained labour forces available more or less on demand (e.g. Standing 1999; Smart & Smart 2005). Flexibility can thus be associated with job insecurity, short-term contracts and part-time working and the so-called 'feminization' of labour; for employers the ability to out-source, cut costs and respond rapidly to market conditions. In this view flexibility in education can also be seen largely as a response to globalised yet fragmented markets, and the increasing insistence on knowledge, training and education as a commodity, and one for which the costs can be increasingly transferred away from government and towards employers or individuals. The onus to adapt to (for which read 'accept') change in a globalised world through lifelong learning is often placed on the employee/learner (Edwards *et al.* 2004: 160 – 164). But others, more positively, have seen 'flexibility' associated with ways of increasing access to education, especially for traditionally under-represented groups of increasingly diverse students. This is coupled with moves from elite to mass Higher Education systems, the increasing availability and use of new technologies (initially radio and television, as well as the later forms of ICT), and associated developments in pedagogical theory (see e.g. Jakupiec and Garrick 2000). For Taylor *et al.* (1996: 49) academics tended to see flexibility as:

'involving the provision of increased learning opportunities and options. In addition, "flexibility" was seen as an attempt to work towards the notion

of the autonomous learner, particularly challenging the “culture of dependence amongst on-campus students”.

Thirteen years after that was written the landscape of learning has changed: technology especially makes it possible either to make the notion of the ‘autonomous learner’ more applicable to all students, thus only offering personal, face-to-face or at least synchronous support at key points, and potentially enabling mass teaching, staff reductions or both; or equally making it possible to mimic a ‘culture of dependence’ among groups whether physically co-present or not. Virtual classrooms, bulletin boards, wikis, blogs can all be used or thought of as if they represent peer group or tutor-student group interaction in a supportive way which encourages dependent, rather than independent learning. A broad definition of student-centred flexible learning was developed by Deakin University in Australia:

Flexible learning refers to an approach that places the needs of learners... at the centre and takes account... of the particular circumstances of learners and teachers, the requirements of the subject of study and the available options for learning methods and *milieux*. Flexibility may apply to access to courses; accommodating diverse student groups in a course; the place, time and pace of study; the form and pattern of interactions among learners and teachers; and the type and variety of resources to support study and communication. Underpinning principles include primary emphasis on student learning; catering for diverse backgrounds and learning styles of students; accommodating diverse learning environments; recurrent education as a lifelong process; and the appropriate use of information and communication technologies to facilitate learning.’ (Calvert 1998 cited in Bottomley 2000)

The above refers to flexibility in just about every aspect of learning and teaching. I don’t know how successful Deakin University has been in implementing this particular policy, nor what the students or teaching staff feel about its success as opposed to administrators and managers, but this is clearly an ideal vision of ‘flexible learning’, and inevitably there will be practical constraints in implementing that kind of policy. With regard to the various categories and perspectives on what exactly constitutes flexible learning, there is though at least some overlap and agreement between parts of the various constituencies.

Within the UK, which has espoused a kind of neo-liberal economics for the last 30 years, it is fair to say that the economic rationalist argument has tended to dominate. But there have also been other factors. Among those not involved in delivering education, and just like the internet bubble, so flexible learning and especially e-learning was seen as a desirable initiative for senior managers and politicians to be associated with. E-learning and new technologies were seen as revolutionary; the rulebook for learning and education provision could be thrown out of the window; content mattered less than the platform and the medium really did become a large part of the message. To politicians, the promise was alluring: just as the internet supposedly provided unlimited opportunities for commerce unconstrained by the ‘old’ business models, so e-learning, with all the excitement of technology, could revolutionise education provision. In the UK in 2000 the government decided to start an ‘e-university’ from scratch using business people and consultants, rather than those already experienced in delivering education in a variety of media (Education and Skills Committee 2005). It collapsed disastrously in 2004, *sans* funding, *sans* courses and *sans* students, but having consumed a great deal of resources, including payment of a ‘performance bonus’ to its leader. A subsequent report into the fiasco of the UKEU, as it was called, noted that the:

‘UKEU allowed the development of the technology platform to drive its strategy and the development of programmes. It had a skewed focus on the platform, based on an assumption that once this was right, the original projections of very high student numbers would be easy to realise. Unfortunately this assumption was not based on research evidence, but on an over-confident presumption about the scale of the demand for wholly internet based e-learning.’

(Education and Skills Committee 2005: 41)

With fingers burned, and despite some rhetoric about how e-learning could improve access, flexibility, and enable better use of resources, in practice it has proved easiest for UK governments to concentrate on vocational training and the perceived requirements of employers or ‘the economy’ rather than the needs (or wishes) of actual or potential students, teachers or institutions. These constituencies do have aspects in common: flexible learning is commonly seen as a way of widening participation in post-compulsory education, for example, though whether resources always usefully follow the rhetoric is

a very debatable point. A related issue, the heightened attention being given to Continuing Professional Development (CPD), is also highly relevant for much flexible provision. Being optimistic, it enables students to fit in ways of developing their own careers, education and prospects – their individual aspirations – around their own lifestyles and commitments. It can also be thought of as improving the skills and knowledge base of their institutions and employers and the country (or EU) as well as those of individuals. Being cynical, it also easily enables employers to shift at least some of the burden away from themselves: for example they do not have to make time available within the working day for study or training; they can also, intentionally or not, transfer some of the monetary cost to the employee/student, since it is not taking place in work time. Apart from fees, e-provision is also well-known as a mode of delivery which often results in transferring book and especially printing costs away from institutions and to individual students, who often prefer to engage with texts away from a computer screen. Access to e-resources is also often time-limited in ways that books are not, which encourages such individual printing.

But because e-learning is genuinely international and simultaneous, self-contained materials do of course overcome the problem of distribution and some forms of learning at a distance: geography really does not matter in many aspects of e-learning. Thus e-learning also proves particularly attractive not only to individuals, but also to geographically dispersed ‘learning communities’. This is seen for example within multi-national companies who can provide common training to all their employees, for example (Jurich *et al.* 2002); and this is one reason why e-learning also appeals to pan-national institutions including the EU. E-learning and ICT more generally offer ways of engaging with issues of integration, consistency, awareness, the promotion of co-operation and so forth. There are also negative aspects to which some have drawn attention: does such easy communication lead to an emphasis on ‘branding’ rather than content? Does the common denominator and large and varied audiences encourage superficiality and homogeneity of provision, rather than the stimulus of friction and difference? In Europe too there are arguably disadvantages to ‘integration’ as well as benefits, and the values, goals and effects of European cultural programmes including those related to archaeology are disputed (Archaeological Dialogues 2008; Pluciennik 1998). All this is part of the context of the project which this conference is celebrating and of archaeology and e-learning more generally.

Nevertheless, as suggested at Deakin University, flexible learning including e-learning can also be rightly glossed in terms of better access to educational opportunities and widening participation. There are a number of barriers which may discourage particular people from entering or staying within archaeology or HE, or more generally blocking their aspirations: these are geographical, socio-cultural, physical, financial and logistic. Certainly our distance learning students at Leicester would include some who would feel vulnerable and uncertain attending university in person, at least to start with. We have an open access policy at our introductory level, because distance and e-learning doesn’t limit the size of groups in the same way as the physical constraints of traditional face-to-face learning may, and we are more interested in whether students can come out with qualifications, rather than policing them on the way in. Other socio-cultural reasons include class or other group perceptions of and attitudes towards Higher Education or debt, for example; inability to pay or unwillingness to accumulate debt; cultural disapproval of the worth of particular subjects or suitability for, say, women; physical disabilities (some of which may be particularly pertinent to aspects of archaeology); individual circumstances e.g. commitments to care for others, other jobs, partner’s commitments, preference to remain where one is, wish to study archaeology for leisure only – all these may restrict individual availability for study in the traditional way. Obviously many of these are matters which have to be addressed at a much wider level, such as the nature of aspirations among socio-economic groups, or distribution of resources. But this is not to say that we should not try to counter such barriers in various ways, and potentially e-learning (and distance-learning) offer some support for this. Physical disabilities are often to be dealt with on an individual case basis. Increasingly, at Leicester, we are finding a small but growing number of students coming to us who are interested in and want to do archaeology, but are confined to their homes for various medical reasons; or are in prison or other institutions with limited library (and computer) access; or cannot deal with traditional materials for reasons of disability: we have pioneered a course for the blind and severely visually-handicapped, for example. Many others are nervous of attempting (or returning to) Higher Education, and we and other flexible learning providers may offer an unembarrassing and relatively pain-free way in, ironically largely because of the isolation and lack of personal interactivity that often cited as a disadvantage of distance learning.

So in summary: one can criticise aspects of flexible learning as ways of shifting education and training costs from the state and employers towards individuals; and parts of, and responses to the widening participation agenda can be seen as collaboration with particular contemporary capitalist demands and practices. It has been argued that flexible learning is largely shaped by the demand for a particular type of labour force whose members are expected to engage in lifelong learning, but primarily for the benefit of their organisations. The state sector of higher education and many of our institutions and organisations are themselves acting within certain market forces, subject to often debilitating management within the so-called 'audit economy' (Shore and Wright 2000). But there are also many potential direct benefits of flexible and e-learning. Institutionally, it is another way of hedging against potentially falling traditional recruitment – of spreading risk. It presents another way of managing the risks from changes in our primary markets and recruitment pools, and a way of coping with internationalisation and globalisation. Nevertheless, for many of us the development of flexible learning is part of a general commitment to increasing opportunities, for those who have the ability and wish to do so, to study archaeology among other subjects: it can be part of an emancipatory and inclusive educational strategy, of reaching new groups, enabling new learning and communication opportunities for individuals and collectivities across borders and boundaries whether sociological or physical. Thus for a variety of reasons I think we can safely predict that in the immediate future at least various aspects and modes of flexible learning and especially e-learning in archaeology, as elsewhere, may generally become more important. This is suggested by developments in technology, attitudes towards learning, and trends in national, pan-national and international policies towards training and professional development. And this means that the provision of learning is likely to become generally more complex, as it engages with different groups, in different ways, for different purposes, in dynamic educational, economic, cultural, commercial and technological environments.

Complexities of provision

To evaluate the reasons why we should or should not promote or adopt particular practices in specific situations we need to understand the parameters by which successful distance learning and e-learning are judged from various different perspectives – students, teacher, administrator, institution,

company, accountant, technologist, researcher. But because many of these groups are varied within themselves in terms of experience, expectations, education, skills, as well as in the aims and objectives of the teaching materials, and indeed the nature of the objects of disciplinary study and focus, we should not expect that e-learning materials will always be similar to each other, or indeed to other forms of presentation, learning or teaching. And technologies, including the ubiquitous PowerPoint, for example, even if on one level a simple replacement of an earlier technology such as film slides or transparencies, can change the nature of face-to-face teaching, let alone when inserted into a Virtual Learning Environment (see for example Gabriel 2008). The range of technologies and forms of technologies I mentioned earlier – and no doubt many more to come – together with the requirements of particular student groups, or institutions, or teachers and teaching styles, and disciplines, and courses, mean that there is a very complex matrix of possibilities for how best to deliver teaching materials and how to engage learners. There are opportunities for many combinations of perspectives, forms and structures. For example technologies can vary in richness (the kinds and numbers of technologies employed within a particular e-learning environment); depth (how much and how learning materials are made available); appropriateness (e.g. the need for zoomable plans, interactivity, real or simulated data, links to text, video tutorials, virtual classrooms etc); medium (digital? Web-based? Mobile; Virtual?) There are different chronisms of communication (permanent, ephemeral, synchronous, asynchronous etc); different learning objectives, disciplinary 'objects' and the natures of disciplinary knowledge; variety in student backgrounds, experience and education; and variation in finance and/or time and/or people available (see Figure 1).

My basic argument is that while most teaching practitioners understand that there is no one model for e-learning – which is potentially a good and liberating aspect – institutions and commercial companies often find it much easier (and on the face of it cheaper) to act as if there were. And that is where some of the tensions come in.

The difficulties of implementation

For example: some of the functionality of this ICT, especially that which enables potentially instant communication, has led to a naive view, especially among those who are not actually doing the teaching, that e-learning should be about replicating as far as possible campus-based experiences for students

Nature of technology	Richness	Depth	Appropriate?	Chronism	Availability
Nature of students	Background	Experience	Education	Finance	Time
Nature of discipline	Practical	Theoretical	Lab-based	Individual	Team-based
Level of learning	Introductory	Degree	Graduate	Research	Professional
Level of support	Minimal	Assessment	Tutoring	Pastoral	Participatory
Learning objectives	Knowledge	Assessment	Skills	Training	Qualifications
Institutional requirements	Staff	Investment	Fund-raising	Support	Maintenance

at a distance. That is why we have the term ‘Virtual Classrooms’, among other things. Yet those virtual classrooms, bulletin boards, wikis and blogs are not substitutes or replacements for seminars or tutorial groups; text-based communication is not the same as verbal communication especially with all the richness of nuance, inflection and body language. However, this is not to say that digital media are inevitably worse, but rather to recognise that they are different with their own strengths and weaknesses. For example, sometimes, the lack of embodied persona in electronic media can be an advantage – it can helpfully depersonalise, de-individualise and even democratise exchanges. But one needs to be aware not only that text is not the same as speech, or face-to-face delivery, and that the use of (say) VOIP and webcams (as in the MA in Digital Heritage discussed below) introduces interesting and new issues of pedagogy, rather than sidestepping or reproducing old ones through digital means.

Figure 1 The complexities of e-learning provision: some of the parameters.

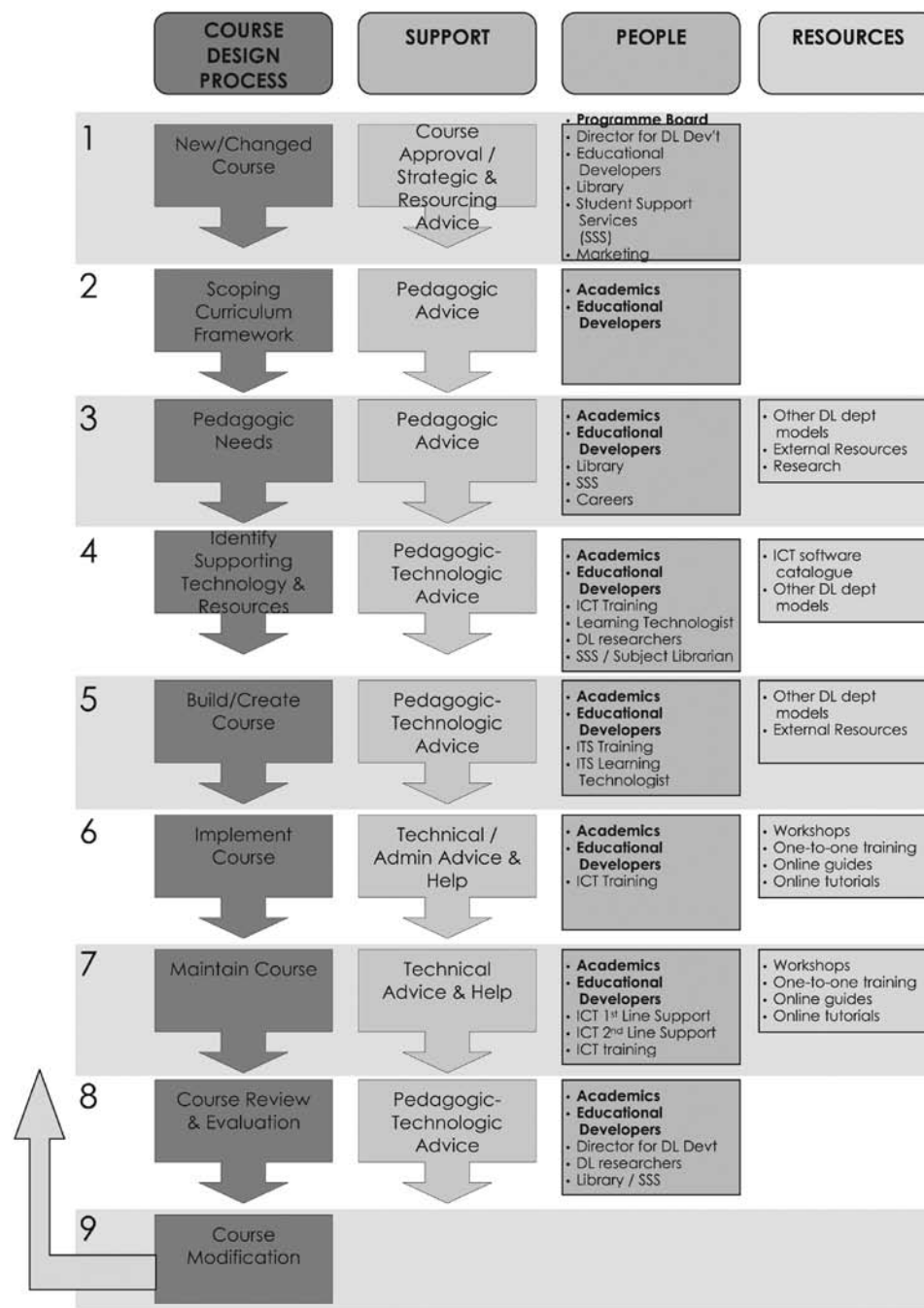
At the same time there is the view that campus-based or distance-learning teaching using e-learning methods can enable scalability and efficiency (and increase institutional size and income) – ever larger groups, repeated delivery, mechanised assessment and using largely digital resources which relieve e.g. pressure on libraries and teaching rooms. This is partly true, and is one of the benefits of e-learning in making possible new forms of mass education. It can also make viable specialist and niche education by enabling sufficiently large student cohorts to justify investment in course material production. But by and large research suggests that the costs of providing e-learning are in fact often comparable to those of traditional forms (Bottomley 2000: 102 – 4; Rumble 1997; Wentling & Park 2002), though of course costs to students (in terms of travel, accommodation, lack of earnings and so forth) may be considerably less.

There is also the danger of technophilia, which can affect not only politicians, as seen in the example of the UKU described above, but also some educationalists. Technologies can in themselves become very seductive – they are sometimes perceived as ‘cool’ and fitting in with especially ‘young people’s lifestyles’ – can we deliver courses to mobiles? MP3 players? Virtual worlds? Via Facebook? YouTube? This actually stereotypes both students and indeed technological use-patterns – which are not always strongly related to age, rather than class, location or education, for example. For some educationalists and educational technologists who may themselves be innovators, the *technologies of delivery* can become the ‘cutting-edge’ and the exciting aspect, with a great loss of focus on both student needs and desires, academic requirements and wishes, and especially academic content. There are various costs associated with this: one is that academics (or students) may easily find themselves spending more time on learning their way around new platforms, media and softwares and their updates than they do on the subject matter. The speed of technological innovation and rate of software revision can make this a real problem, and also act as a potential barrier to genuine widening participation. ‘Early adopters’ of technology may be catered for, but others effectively shut out or discouraged. My own university has a ‘Learning and Teaching Strategy’ which insists that students must have more-or-less continuous high-speed access to the internet, not recognising that off-campus and for some individuals, constituencies and (parts of) countries this is unrealistic, exclusive, simply unavailable or too expensive.

Should we listen to students?

Not everyone wants the same delivery or learning methods. The Open University in the UK, a large, successful and long-established distance-learning institution, found that using discussion lists sometimes attracted a relatively small proportion of participants: some did not log in at all, others observed but did not contribute to discussions – they were ‘lurkers’. The OU perceived this as a ‘problem’ to do with the ‘learning community’, and hence on at least one programme, introduced sanctions for those who did not participate: an assessment was partly-based on email discussions, and those who did not contribute were required to lose 15% of their mark. A substantial minority preferred to be penalised rather than take part in such enforced dialogues. At my own institution I have similarly been advised by e-learning educationalists to make assessment partly or wholly dependent on digital materials as a way of enforcing student log-in. But we also know from student feedback that many (and especially after spending a day at work on a computer) prefer not to spend more time staring at a screen. Yet some also – rightly – complain that materials do not print-out properly if they are written for digital distribution. In addition, they want a permanent record of their course materials, which can be easily annotated and added to, and which will not disappear from their view after their registration period has finished. However, they like being able to explore, for example, maps, plans and other images, and especially the ability to link through directly from screen to e.g. journal articles without having to type in a web address, sign into the library and so forth. Balancing these individually perfectly reasonable needs which are, though, partly contradictory and in any event not shared by all the student community or cohort, simply adds to the complexity of e-learning provision. Which is why our preferred route at the moment is precisely to offer ‘hybrid delivery’ in various forms – as cd-roms and hard text; as modules and materials in a VLE and hard text; as primarily hard-text materials but with digital ‘resource areas’. I discuss some examples below.

Figure 2 Flow diagram summarising typical e-learning course design and development processes within a university (adapted from Helen Lentell and Alex Moseley, pers. comm.). This series of processes is itself normally preceded by informal and formal discussions at departmental and sub-departmental levels, where initiation typically takes place.



Organizational issues

With increased capacity offered partly through technology, student groups are potentially becoming perhaps both larger and more fragmented, and in any event more various in many ways. Across any institution there will be disciplinary differences of emphasis and both across and within disciplines different requirements and emphases at various levels between training, information provision and knowledge transfer, learning and research through various media. Producing materials which are relevant and appropriate for these different groups and requirements is in itself much more complex than typical traditional campus-based courses, and in general requires a far higher initial investment of time and people. Institutionally, whether or not e-learning is thus worth this investment (in traditional accounting terms) broadly depends on student numbers (assuming these are funded or fee-paying), fees, longevity of materials and their maintenance and support costs, and the intensity of support required for the students. Producing distance-learning and e-learning materials is itself a complex task (see Figure 2).

For those institutions wishing to develop not just e-learning, but also accepting the wider mission of flexible learning outlined above, there are thus many more structural, organizational and administrative implications. Apart from changed patterns of investment, there are issues of student records, income, staff management and culture – to be effective and efficient ‘flexible learning’ has to be available all year round and with multiple start and finish dates, for example, which changes the pattern and tempo of academic staff time, and has many other knock-on effects which I won’t go into here. In my own institution, which has long been involved in distance learning as well as traditional campus-based delivery, and both modes which increasingly use versions of e-learning as one of the delivery modes, flexible learning has largely been developed relatively independently within departments. This has been excellent from the point of view of producing materials and modes of delivery which are disciplinarily-relevant and appropriate for the particular cohorts of students. As an example of fragmented organic growth it has produced much interesting variety. But it is not proving easy to communicate the values of such variety among the disparate and dispersed practitioners, nor to learn from good (or bad!) practices and change; departmental or disciplinary traditions of doing, structures of practice can become easily sedimented and then fixed within bureaucratic procedures. And often procedures and the academic and administrative architectures developed for

traditional delivery are wholly inappropriate for flexible delivery and learning. As we are finding to our cost, increasingly database structures are insufficiently-detailed and inflexible at the institutional level, yet fragmented and incompatible or otherwise inappropriate at disciplinary or departmental levels, and change can require major and costly re-engineering. Yet simply providing e-learning within traditional structures is surely not taking full advantage of what these new technologies can offer in practical and social and political terms.

Case studies

Finally I want to present four very brief examples of ways, each from my own institution, in which primarily archaeological or related materials are presented and delivered using e-learning resources of various kinds.

Case study 1: Digital delivery

The simplest case is that of a postgraduate module on the *Archaeology of Standing Buildings* which had initially been delivered as a hard copy text in a large folder, plus associated textbooks and journal offprints. From 2005 we produced this in web browser format on a cd – this was the most compatible with any platform of almost any age. Lack of full digital copyright permissions meant that although weblinks could be included, not all associated teaching materials could, and so a hard copy element was still required. Student response has shown very little concern about the medium, except for a small number who claimed that it did not print out correctly, showing that some at least still prefer all hard copy to engage with. A similar response was met from students where preparatory material for a field course was provided in Blackboard, a Virtual Learning Environment: while liking the ability to click directly on hyperlinks to access journal material, they did not like the way that the main text printed, yet this was the only way they could keep a permanent record of the course materials (access will expire with their student registration).

Case study 2: Materials for the visually-impaired

We have produced a short module, *Introduction to Archaeology*, which is specifically-designed to use digital and other media as a way of making material available for visually-impaired students. The module text was written expressly for this project, bearing in mind the variety of ways students might be accessing this material (visually, aurally, braille) and for the inclusion and

production of accompanying artefacts. The module text was produced in a range of formats: print (large font); digital (cd-rom) in order to be used with a screen reading package such as JAWS, or a screen magnification package such as LUNAR, or even LUNAR PLUS, which is a combination of magnification and speech; audio as an MP3 file; and Braille print. Ensuring that prospective students had access to this range of formats was a key element in the production of this module, allowing students to select and combine formats according to individual need. This of course affected the ways in which visual material such as graphs, tables and photographs could be presented – Braille for example, is not suitable for the reproduction of tables. On the advice of staff at the Royal National Institute for the Blind we also ensured that any visual materials (such as pictures, site plans and so forth) were described in the text as fully as possible.

We also produced a set of enlarged reproductions of ‘real’ archaeological artefacts which were closely linked to different sections of the text and could thus be seen by the partly-sighted, and felt by those without sufficient sight. These replica artefact sets were made available in specially designed boxes where each artefact was numbered and linked by cord to a specific part of the box, meaning that each artefact would be returned to its correct place after each examination. For further details including artefact images and student response see Pluciennik & Young (2009).

Case study 3: Teaching through avatars in a virtual world

As part of a research project, we have experimented with using the virtual world Second Life as a medium for delivering synchronous experiences (tutorials?) in spatial theory in archaeology (Edirinsingha *et al.* 2009). It should be noted that the group had students from the UK, Germany and the USA, and it was difficult to find a time when all could ‘meet’. Nevertheless, we prepared four hour-long sessions, which included a digital simulacrum of a Sami tent, and a Kalasha village including a birthing hut, to parts of which entry for avatars was restricted according to gender. Communication and teaching in Second Life included PowerPoint presentations on virtual screens e.g. within the virtual village and the surrounding landscape, and by ‘chat’ – almost instant text messaging, allowing exchange and dialogue. (Voice exchange would also have been possible). Logs of conversations were subsequently available to all. Students who participated were genuinely enthusiastic and did feel that they were getting to ‘know’ staff and students better

even in avatar form, and also engaged well with the ideas being presented. However, preparation time (including building virtual landscapes and structures) was lengthy, and it was a staff-intensive if rewarding way of delivering a relatively small part of one module to a small group of students.

Case study 4: Museum Studies and Digital Heritage

A newly-introduced MA in Digital Heritage (Museum Studies 2009), perhaps surprisingly to some, despite the subject and required technological expertise of the developers and students, deliberately does not rely solely on digital delivery. Student responses and educational consideration have guided production of materials in a variety of forms and media ranging from hard copy texts to group tutorials conducted through Skype (using webcams and VOIP), materials in a VLE including a ‘Common Room’ jointly-curated by students and staff, and various web resources. These various media were chosen by the academic developers who are experienced in the provision of d- and e-learning.

The examples briefly described above, and to our knowledge many others, suggest that e-learning in whatever form is not a blanket answer or solution, no more than would be lectures, or textbooks, or practical classes, or essays or examinations as the *only* means of teaching or assessment in any field. But what digital resources do make possible – albeit at a cost – is for many more ways of teaching, learning and doing to be explored and adopted as appropriate. They can also potentially play a very large role in developing or improving access to education for many groups of people, in the same ways that earlier technologies of print, radio and television have also done. What learning is and might be will also change – user-constructed groups and resources are becoming an increasingly important and an interesting dynamic, both as a part of formal education, but also as an educational analogy to open-source software, for example. E-learning and associated developments will also no doubt have less-intended consequences. Over the longer term, the socio-political implications are as interesting as the educational ones, perhaps.

Conclusion

What seems likely though is that not all learning is ever going to be by e-learning (or distance learning) – at some stage one has to go on site, in the field, in the laboratory, into the archive, the workplace, factory, or organisation; one has to learn practical and embodied skills directly through

doing – finds processing, assemblage analysis, buildings recording, surveying and excavation for archaeological generalists, at least; similar though different requirements will apply for most if not all other disciplines. Not everything can be done through digital presentation and simulation, video or manipulation of processed data. E-learning is not a substitute: it is a complement, even if sometimes such delivery can replace parts of other forms of education. So what we seem likely to end up with in many disciplines including archaeology, is what is called hybrid or blended learning, in which education is delivered through many media. Of course, many of us are already used to that in campus situations: large groups, small groups, independent learning using traditional books and journals, presentations and materials within Virtual Learning Environments, on-line resources. But – in the UK at least – what hasn't often kept pace is the institutional understanding and management of what genuine flexible, hybrid learning implies behind the scenes. If one is talking about a widespread and easily available *system* of flexible learning including much e-learning (rather than small-scale research or other projects), then we need to think seriously about the kind of structural, resource and staff implications for supplying and maintaining high-quality and up-to-date education, at whatever levels. Given current economic forecasts, that might be the biggest challenge of all, over the next decade.

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02

E-learning in archaeological heritage. An example of 'Archaeological heritage in contemporary Europe' a distance learning course *Arkadiusz Marciniak*

Introduction

Archaeological heritage constitutes finite and non-renewable cultural resources of humanity. Its preservation, management, and conservation is an indispensable element of international and national heritage politics. Hence, any decision undertaken in this sensible domain needs to be solidly grounded and well informed. This is particularly important considering the range of vital changes experienced over the last few decades. The upsurge in infrastructure development and urban expansion across Europe and intensive agriculture have brought about the large scale destruction of numerous archaeological sites and landscapes. Awareness of these threats to the substance of our archaeological heritage and the fast pace of its destruction is now much more common than two decades ago and archaeologists themselves are more aware of their own responsibility to protect this heritage (see Kobyliński 2001a). Further developments comprised the internationalization and standardization of archaeological heritage management as manifested by the adoption of international standards and regulations such as e.g. the Valletta Convention or later the European Landscape Convention and its implementation in national legal regulations. Consequently, much of the attention has been shifted towards landscapes and planning. It became clear that archaeological heritage management should become integrated in planning (Fairclough & Grau Møller 2008).

These changes resulted in the move to development funding projects and have brought new concern for professional standards and accountability to archaeology. Taking management decisions based on argued presentations

and justifications has also led to important changes in the way we see archaeological data and the manner of assessing their significance and value. The dynamic development of rescue archaeology has significantly shaped the character of European archaeology in the form of the commercialization of the archaeological profession. The emergence of private archaeological firms working on rescue projects has led to the rapid creation of quite a new professional group on the market. It is characterized by a high efficiency in conducting long excavation work on a large scale. Consequently, doing archaeology is now seen by many archaeologists as a public enterprise that draws attention to the social role of their work and the relationship between the producer and consumer of archaeological data. The protection and management of archaeological data is no longer a matter of concern to the academic community but to the general public (see Kobyliński 2001b; Holtorf 2005; Marciniak 2006, 2010).

The last two decades are also marked by the use of archaeological evidence for the creation of collective memories of local communities but in a way different from the past when archaeology was aimed at justifying nationalistic claims. The public is becoming recognized as a stakeholder in the decision-making process of heritage management and its role as a consumer of the products of archaeological activity is getting apparent. Advances in information technology have also enforced a greater openness of archaeological activities and resulted in the breakdown of the dominant elitist attitudes of the professional milieu.

One way of dealing with the challenges posed by recent developments is education. The need of developing and upgrading vocational skills in the sector of the protection and management of archaeological heritage as well as the final users, decision-makers and experts at different levels is a must taking into account the current state of the heritage sector across Europe. This is further strengthened by the increased scope of co-operation that increased dramatically but did not facilitate easy access to all available resources including EU-funded projects (Marciniak 2010).

Doubtless to say, the very nature and consequences of these rapid changes in almost all domains of archaeological heritage, including its theoretical foundations and practical regulations, are not sufficiently known among people professionally responsible for the protection and management of archaeological heritage in particular countries. This refers in particular to archaeologists with decades of experience who completed their academic

training some decades ago. Needless to say, these developments increased the demand for properly trained professionals. This makes it possible to identify emerging challenges and to be able to protect and manage the archaeological heritage in a more efficient way.

The Leonardo da Vinci project *E-learning as a tool of knowledge transfer in the field of protection and management of archaeological heritage* arose due to the perception of an unsatisfactory dissemination of newly emerged archaeological heritage issues among practitioners in the field across Europe. Hence, its explicit objective was to exchange the best practices and innovative solutions in this field. Consequently, the project was aimed at supporting participating countries' policies and actions to equip those of a limited access to the newest knowledge and whose qualifications need updating in addition to students who have no qualifications. As such, it can be regarded as a case study in which European standards and regulations were taught in a peculiar context of protection and management of the archaeological heritage sector in participating countries. The project was then intended to consolidate European co-operation in education and training in the sector. In particular, its major purpose was to design, develop, test, assess and implement innovative solutions in developing and upgrading vocational skills in this sector at the European level.

A sensible vocational training in the field of archaeological heritage management requires a set of new educational tools to be available in an easily accessible form to various categories of users. E-learning solutions is a perfect tool supporting the didactic process. The basic advantage of e-learning is that training can take place at any time and in any place. Such solutions satisfy directly the needs of the target groups as well as other potential users. To my best knowledge, the training in the field of protection and management of archaeological heritage was never carried out with the application of e-learning solutions. Hence, there is no frame of reference as regards the methodology of e-learning training in this domain. Accordingly, the project developed and implemented new methodology including a transfer of knowledge from the conventional to the e-learning format and the elaborated training methodology. The project eventually resulted in the production of a multimedia e-learning course composed of fifteen interrelated modules.

The project was conducted by institutions representing six EU member states including Germany, Latvia, the Netherlands, Poland, Sweden, and the

United Kingdom. It was co-ordinated by the Instytut Prahistorii and Wydział Matematyki i Informatyki Uniwersytetu im. Adama Mickiewicza w Poznaniu and the partnership comprised also Amsterdams Archeologisch Centrum, Universiteit van Amsterdam; Institutionen för arkeologi, Göteborgs universitet; Latvijas Universitate, Vestures un filozofijas fakultate; Institut für Prä-historische Archäologie, M.-Luther-Universität Halle-Wittenberg; and English Heritage. The partners ensured transnational co-operation from a different and complementary institutional and cultural background. All of them have extensive experience in the field of archaeological heritage education and vocational training as well as e-learning implementation solutions.

The projects objectives

The project aimed to implement e-learning solutions in vocational training in the field of archaeological heritage protection and management. The entire didactic process was focused upon the presentation of a range of vital aspects of archaeological heritage taking into consideration on the one hand the particular character of solutions in different countries and on the other hand a need for their standardization in the light of European integration. Consequently, this will eventually render the possibility for the universities to elaborate graduate curricula which will ensure access to knowledge, the quality of scope of which will correspond to full time studies. A well defined and described methodology of the application e-learning solutions in the educational process will render the possibility to modify curricula in particular subjects and change the number of periods and relations between classes, lectures, workshops and consultations. By applying e-learning, the barrier connected to time restrictions and students dispersion will be eliminated.

The project led to the elaboration of a cohesive methodology of e-learning course production in the field of archaeological heritage protection and management (see J. Marciniak in this volume). This formed a basis for conducting test training among end users. It made possible the production of fifteen multimedia e-learning modules covering the most significant issues in this field and their distribution between the partners. Eventually, a test training was carried out in all participating countries. Their content was distributed in the form of web based training using the e-learning platform for internet training at Adam Mickiewicz University in Poznan.

The training was followed by a systematic evaluation of the usefulness and efficiency of e-learning solutions in the field among different target groups in

participating countries considering its peculiarity and different experiences. According to the results of this survey, the training substantially increases knowledge, experience and the qualifications of people and institutions who jointly work on the project (see Marciniak & Chwieduk; Šne in this volume).

The projects trainees

The main and direct target group in the project were professionals in the sector of archaeological heritage protection and management as well as graduate and extramural students interested in this field of expertise from participating countries. Other specialists working in the archaeological sector or people somehow related to this sector, such as contract archaeologists, planners, architects, forest rangers, etc. supplemented this group. Since this is a largely dispersed group, the internet has provided the most efficient application for communication and high quality vocational knowledge distribution.

The project was first of all directed to professionals in the sector of archaeological heritage protection and management. They are usually employed in local branches of the heritage sector in participating countries located in provincial capitals, while their branches are placed in smaller cities. Understandably, the group is largely dispersed and is characterized by a varied access to the newest knowledge in the field. This group is professionally very active and hence methods of vocational training need to combine efficiency of the educational process with their obvious time constraints. Other segments of this group are comprised of different individuals working in the archaeological sector or otherwise related to it. A dispersal of this group is even larger than the heritage sectors employees. They are associated with archaeological heritage related issues on an irregular basis. Consequently, keeping them up-to-date with recent developments in this field is a prerequisite condition to facilitate efficient and beneficial co-operation with the archaeological heritage sector.

The second major target group is comprised of graduate and extramural students of universities from participating countries. A consequence of the old-fashioned system of archaeological education in the new EU countries, as evident in Poland and Latvia, is an almost complete lack of heritage courses in university curricula. This is particularly unfortunate as archaeological heritage is becoming the backbone of contemporary archaeology and the broadly understood heritage sector today creates the majority of

archaeological jobs. At the same time, graduate students from the old EU countries usually suffer a lack of systematic knowledge of the complexity of heritage issues in the countries that recently joined the EU, especially in these with whom share similar conditions of northern Europe and have a comparable archaeological potential.

The results of the project clearly stretched out far beyond the direct target groups. Its products can be used among employees in the sectors of protection and management of archaeological heritage in all European countries, both new and old EU members, as well as other individuals working in the archaeological sector or otherwise related to it. Other potential users might comprise graduate students interested in the protection and management of archaeological heritage at universities across Europe. They can either use the project results in languages of the project partners or translate them into their own languages.

The training content

As mentioned above, the major objective of the e-learning training was to get a group of trainees acquainted with the most appealing issues in archaeological protection and management across Europe and provide them with practical solutions in their implementation. For heritage professionals, this knowledge is meant to be efficiently implemented into their own professional practice. Students have got a body of knowledge produced by leading experts in the field in Europe making it possible to recognize the most appealing issues in the domain of protection and management of archaeological heritage across Europe. This will considerably enrich their qualifications in the job market.

The training was composed of fifteen individual modules and contributed to a better understanding of the changing nature of archaeological heritage as well as economic, social and political circumstances that shape its character. They stressed the general public as an important agent in archaeological heritage policies and discussed the diverse concerns of numerous public constituencies in the practice of heritage offices. The second major objective was to recognize the principles of mapping archaeological resources with an historical context of its development as well as get to know the basics of GIS techniques, aerial photography and geophysics in the practice of the archaeological heritage sector. The course also stressed the significance of efficient methods of the valorization of archaeological resources e.g. by the implemen-

tation of the concept of a biography of landscape in providing a better understanding of archaeological heritage by the general public. Another block of issues comprised principles of international conventions in the field of protection as well as the modern management of archaeological resources and requirements of its sustainable development. A special part of the course was devoted to discussing the challenges and pitfalls of commercial archaeology. The course also stressed the importance of communication with the public as well as presenting efficient methods of engagements, publicity and media relationships in addition to the ways of presenting heritage issues in museums and schools. Each module was prepared by one or two representatives of the participating institutions after consulting its contents among the partners. The details of the trainings constituent parts are provided in Table 1.

The first part of the course *Theory of archaeological heritage* was aimed at discussing numerous facets of cultural heritage and set its archaeological component in a broader context. It addressed its dynamic character and stressed numerous and intertwined conditions of its development in changing historical, social, and political circumstances. In particular, this part advocated a need of the explicit identification of the general public as an important agent in archaeological heritage policies and introduced the concept of a stakeholder. The plurality of the perspectives needs to be in place within archaeological heritage management to address the diverse concerns of numerous public constituencies. The major objective of this introductory part of the training was also to present the theoretical foundations of archaeological heritage as well as the mechanisms of its construction in today's dynamically changing economic, social and political circumstances. It stressed the increasing significance of public constituencies whose needs and expectations need to be identified, addressed and met in the practice of heritage offices (e.g. Chippendale et al. 1990; Skeates 2000; Fairclough 2002; Ashworth 2005; Carman 2005).

The second part entitled the *Mapping of archaeological heritage resources* aimed at presenting methods of recognizing and recording archaeological resources as well as managing and analyzing spatial data for the needs of archaeological heritage protection and management. It began by presenting the impact of different archaeological paradigms on the recognition and valorisation of archaeological resources as well as strategies of protection and management of archaeological heritage. Changes in archaeology determined

Course parts	E-learning courses
Theory of archaeological heritage	Theorizing cultural heritage Mentalities and perspectives in archaeological heritage management
Mapping of archaeological heritage resources	Concepts of understanding – spatial valorization of archaeological heritage resources Aerial survey in archaeological protection and management systems Geographic Information System as a method of management of spatial data Geophysical prospection in archaeological protection and management systems
Valorization of archaeological heritage	Images of the past Cultural biography of landscape
Protection and management of archaeological heritage	International conventions and legal frameworks Sustainable development in the archaeological heritage sector Management cycle and information systems in the archaeological heritage sector Commercial archaeology
Politicizing archaeological heritage	A single voice? Archaeological heritage, information boards and public dialogue Methods of engagement, publicity and media relationships Public outreach – museums, schools, services

the development of methods applied to protect and manage archaeological heritage resources and it is widely assumed that the development of academic archaeology has significantly influenced our views on archaeological heritage and the methods applied in this field (Hodder 1992).

A major objective of this part of the training was to present methods of collecting, transferring and analyzing spatial data. It focused in particular on

the systematical discussion of non destructive methods of recognizing archaeological resources, such as aerial photography and geophysical prospection, and the evaluation of their usefulness in archaeological heritage protection and management. The effectiveness of aerial photos depends on their integration with other methods. This mostly implies compounding aerial photos with various geophysical surveys. In the process of integrating different methods in the studies of archaeological sites, all of them should be treated as complementary to each other. Any differences in the results obtained via different methods provide a stimulus for reflection on the reasons for differences, on the site condition, and its preservation and stratification processes (Wilson 2002; Gaffney, Gater 2003).

A separate module was aimed at providing a brief discussion of GIS in the context of its use in heritage management practice, as well as to present a background and solid introduction to the applications and types of information for which a GIS is well suited. It further discussed the limitations of GIS applications in particular contexts. It stressed that the role of GIS in any given project must be well defined to become its useful component, and issues such as accuracy and resolution of a data set must be taken into account when performing analyses and interpreting results (Conolly & Lake 2006; Mehrer & Wescott 2006).

The third part of the course *Valorization of archaeological heritage* was aimed at discussing how images of the past are created and valorized by using elements of archaeological heritage. These images are further used in creating and maintaining local and regional identities. Accordingly, archaeological heritage was presented as being a real fact and invention at the same time. The interest in the study of landscape has increased over the last few decades. In order to serve the value of sustainable development, a strategic approach is called for in the field of planning. For that, it is essential to disseminate knowledge on the history of landscape and landscape elements (Bender 1998; Edgeworth 2006).

In this respect, a biography of landscape as an invented image of the past and a useful tool of analysis, created and carefully maintained, was presented and discussed at length. The metaphor refers to the life history of landscape and as such is a personification. It became recently a tool for sustainable development. The biography approach can be very appealing in its narrative quality, but its selective character can have negative aspects. A good alternative approach could be the Historic Landscape Characterization as developed

recently by English Heritage. It is seen as an important tool for achieving the goals of the European Landscape convention, as it has a more holistic and integrated approach to management and understanding. This part of the course also discussed the concept of authenticity and its significance for archaeological heritage (Aldred & Fairclough 2002; van Londen 2006).

The fourth part of the course *Protection and management of archaeological heritage* was aimed at discussing issues directly connected with the protection and management of archaeological heritage. It provided a systematic overview of these international conventions and regulations that had and remain to have significant impact upon archaeological heritage and its protection and management. During the latter half of the 20th century, the number of international charters and conventions dealing with the conservation and preservation of cultural heritage was prepared and approved both by world (e.g. UNESCO or ICOMOS) or European (mainly Council of Europe) bodies. The charters and standards provided guiding principles towards defining an appropriate response to particular conservation and heritage issues. These conventions and charters had an important effect on education and practice in the domain of protection and management of culture heritage. On the political level, they proved to be important documents for the conservation of cultural property and an indication at the international level of governmental responsibility for the conservation of cultural property (e.g. Fairclough 2002; Fairclough, Rippon 2002).

Over the last few years the concept of sustainability has been translated to the cultural field. Under the pressures of globalisation and general economics it is feared that cultural diversity is under threat. If we want to keep a degree of cultural diversity we actively have to engage with the management of the landscape in a sustainable manner. This module delved into the concept of sustainability and the way in which it applies to cultural resources. This fairly new development in cultural heritage management to deal with sustainability and its affects in the archaeological practice was brought to the fore. There is always a constant balancing act between conservation and development (Cleere 1989; Willems 1998; van der Valk and Bloemers 2006; Aitchison, Edwards 2008).

This part of the training further discussed numerous facets and pitfalls of commercial archaeology (e.g. quality and standard of work, professionalism, ethics, etc.). Questions concerning which elements are of relevance for the

evaluation of the role of commercial archaeology in archaeological heritage management were also explicitly debated.

The fifth part of the course *Politicizing archaeological heritage* was aimed at discussing a range of issues related to the presentation and popularizing of archaeological heritage and communication with the general public at the site, through museums, schools, media, and the internet. All modules in this part explicitly focused upon strategies and methods of achieving these goals by a range different media. In particular, they discussed knowledge production ranging from digital field archaeology, visual representation, knowledge management, and the sociology of knowledge. It presented several projects that are concerned with the ways such processes operate in the context of archaeological information as a means of sharing diverse forms of knowledge with diverse communities. It discussed conceptions of knowledge as performance and the potential of the web as a contact zone, in which environments can be constructed that support the generation and representation of knowledge in, by, and for diverse communities (Biehl 2002, Zevans & Daly 2006).

The modules in this part stressed the importance of communication with the public, methods of engagement, publicity and media relationships. Multimedia technology and the internet have marked a new era in the way archaeology is communicated to the public. Archaeology is undergoing a revolution, with both the presentation of the practical work and theoretical questions regarding what knowledge is communicated and how is the specialist community and the public engaged in this knowledge production and knowledge transfer. This last part of the training presented a case study of a 'multimedia excavation' that also served as a training ground for young heritage management and archaeology students. As such, it outlined how multimedia can be applied to excavating, analyzing, processing and interpreting the past as well as communicating and popularizing archaeology to the public (e.g. Hamilakis 2000; Richards & Robinson 2000; Holtorf 2007).

Learning process

The course was conducted in an assisted distance training mode. This means that all training materials were provided online and the training process was supervised by a teacher. All distance learning activities in the training were provided on the e-learning platform available at www.e-archaeology.org. The e-learning platform refers to the learning management system Edumatic

available at the address above. The training process was made of lectures and practicals. It was conducted in a precisely defined timetable with a clearly specified start and completion date set up separately for each country participating in the course. The training materials were provided as multimedia and interactive e-learning modules available in the Edumatic system for each part of the training. Any auxiliary materials, in particular pdf documents, were placed in the platform in a specially allocated space 'Teacher's documents'.

Students were obliged to get acquainted with the content of each of fifteen courses according to the training timetable carefully designed for each partner. In order to activate their participation in the training they were also obliged to participate in the discussion forum. In the course 'Archaeology in contemporary Europe' there were three such discussion forums:

1. *What is heritage?* as an integral element of the first part of the course, Theory of archaeological heritage; 2. *Archaeological heritage. Fact or construction?* as an element of the third part, Valorization of archaeological heritage; and 3. *Presenting the past and setting the agenda* as an element of the last part Politicizing archaeological heritage. The discussion forums were provided to the trainees according to the precisely designed training timetable.

Students were also urged to prepare one collective homework. This referred to the an essay written by a group of trainees on a given subject aimed at writing an essay. The assigned essay of c. 3000 words in length was aimed to address the *Mapping of archaeological resources in the selected region*. It comprised an integral element of the second part of the course (see above). Trainees were also obliged to prepare individual homework in the form of an essay. It was entitled *How would you change / implement (inter)national legislation and policy to meet the requirements of local heritage?* and comprised an integral element of the fourth part of the course (see above).

In order to complete the course each student had to carefully study all of fifteen e-learning courses. Additionally, they also had to prepare collective and individual essays and write at least two entries into the assigned discussion forum. These entries needed to be positively evaluated by the trainer. Each activity was given a certain number of credits and the final result of each trainee was calculated as a sum of the credits for each obligatory activity.

Final remarks

The combined effects of globalization and democratization have radically altered and expanded contemporary European archaeology in terms of its

academic practices, its professionalism, involvement in archaeological heritage protection as well as its public commitments and responsibilities. Archaeologists need to be well aware of these transformations and prepare to react accordingly to these emerging challenges in archaeological academic research, archaeological heritage protection and management, public engagement in cultural heritage preservation and conservation programs. Designing, development, testing, assessment and the dissemination of innovative solutions in developing and upgrading vocational skills in the protection and management sector of archaeological heritage at the European level undertaken in the Leonardo da Vinci project *E-learning as a tool of knowledge transfer in the field of protection and management of archaeological heritage* aimed at consolidating European co-operation in education and training in the archaeology sector and meeting emerging challenges and demands in the field across Europe.

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03

Methodology and e-learning solutions in 'Archaeological heritage in contemporary Europe' distance learning course

Jacek Marciniak

Introduction

The launch of the 'Archaeological heritage in contemporary Europe' distance learning course, like the launching of every course where the didactic process is driven on the distance, involved undertaking a variety of decisions regarding learning/training methods and e-learning tools which had to be used during the course. In this process it was necessary to regard the specificity of the target group, subjects of learning and the kind of delivered contents. All that in the situation in which in compliance with the author's knowledge was the lack of other experiences regarding the use of e-learning solutions in the archaeological heritage area. During the analysis of the needs of the target group it was necessary to take into consideration habituations in the area of education, time accessibility and interest with the subject of the course. While analyzing the subject and contents of the course it was necessary to take into consideration the fact, that the contents on which learning was based were available before the construction of e-learning solutions and on how much of the contents of the training will be able to be in an easy manner adapted to the needs of the distance learning course.

The choice of the learning methodology and the use of e-learning solutions depended on many factors. Furthermore, during the organization of the course there were available numerous solutions and methods in the sphere of education. This results from the fact that for many years along with technology development different approaches to building the didactic process with the utilization of e-learning solutions were shaped. At the present

moment different solutions are available, where only some of them are treated as effective, comfortable and able to use the available technology well.

In the 'Archaeological heritage in contemporary Europe' distance learning course Web Based Training (WBT) and Facilitated e-learning was accepted. In the accepted model distance e-learning training is realized in the asynchronous mode i.e. there is no need for trainees and teachers to be by the computer at the same time. Facilitated e-learning found that the basic hardship of the training will have to rest on the didactic contents provided to the trainee in electronic form.

Model of distance training

The training model proposed for conducting the distance e-learning course 'Archaeological heritage in contemporary Europe' took into account the needs of the target groups, their accessibility and training habituates. Before proposing the final model, available technical and methodical solutions were analyzed, and after that such solutions were chosen which seemed to be the most suitable.

Overview of distance learning methods

E-learning is a form of the distance education in which the development of skills and knowledge is realized through the use of modern electronic technologies. E-learning is a wide conception, defined in many different ways depending on the kind and the role of the technologies used in the education process. In this day and age, e-learning is such a form of education in which during the didactic process computer and network technologies are used.

During the adoption of e-learning solutions to the needs of the 'Archaeological heritage in contemporary Europe' course accepted, that the didactic process will be conducted with the utilization of the internet network. Such a choice gets out of the generalities of the internet network and to the comparatively cheap access from work and at home. Such a choice at the present moment seems to be rational. However, still 10 years ago it would not be so self-evident. At that time e.g. video-conferencing solutions were eagerly used based on dedicated ISDN interfaces (see e.g. Belanger, Jordan, 2000). However, the popularity of the internet has caused this medium of communication to be used more often today. In connection to the above mentioned foundation in further considerations about e-learning solutions, all other solutions (e.g. video-conferencing, educational television, training with the

use of cd, etc.) will be skipped. Each time during the implementation of the e-learning solutions based on the WBT approach, the analysis of the approach model of this kind of education on two surfaces has to be conducted:

- > What part will be played by the teacher in the didactic process;
- > What manner of the communication among participants of the didactic process is possible.

Analyzing the roles played by the teacher in the education process, the following approaches can be distinguished (Horton, Horton 2003):

- > Instructor-led training – this is the model where the teacher uses Web solutions to conduct conventional classes with distant learners; in this model the teacher is a source of the knowledge in the didactic process;
- > Facilitated e-learning – the model where the teacher supports the process of the education, sources of the knowledge are didactic materials delivered to the trainee in electronic form;
- > Learner-led training – the model where the teacher does not appear, the source of the knowledge are didactic materials delivered in electronic form, the trainee works individually, the progress of his/her work is stored in the central IT system.

The postulate that in the didactic process conducted by distance learning the teacher was a source of knowledge means that the meetings with trainees will be conducted on-line through the use of a camera and a microphone. His/her own lecture will be supported with PowerPoint slides displayed with the picture of the teacher on the trainee's computer. The trainee can at any moment enter into interaction with the teacher using e.g. chat or e-mail or it is possible to communicate through a voice channel.

The postulate that materials in electronic form are a source of knowledge means that such materials have to be elaborated (or gained) before the beginning of the training. Then they will be made available to the trainee through the dedicated IT system, or as regular web pages. The situation is analogous to conducting the didactic process on the basis of the schoolbook which fully answers the needs of this process.

The second of mentioned types of division refers to the manner of the communication between participants of the didactic process (Driscoll, 1998). There are two possible approaches:

- > Communication is realized in the synchronous mode – the model where

all participants of the didactic process (teacher, trainees) must be gathered at the same time (but not in the same place) to be able to participate in the training, the work is realized with the speed imposed and controlled by the teacher. An example of this type of communication model is lectures led by means of videoconferencing solutions;

- > Communication is realized in the asynchronous mode – the model where to participate in the didactic process participants do not need to be at the same time, however they use the same resources in the electronic form to learn individually at any time and at their own speed (tempo).

Joining methods derived from the above two quoted perspectives we will obtain the model of the distance education which will be fully referred to the needs and possibilities of the target group (Marciniak *et al.*, 2007). There will be the possible connection in the instructor-led training model with communication in the synchronous mode (e.g. on-line video-conferencing meetings), or to asynchronous (the access of trainees to lectures videotaped and received by them at any time, the on-line meetings regarding the tutorials will be realized during the chat session at the appointed time). Doubtless to say, not all connections are possible: learner-led training will be always in the asynchronous mode.

Another model regarding the conducting of distance training quoted is the so-called blended learning in other words such a model of the didactic process where participants of the course besides the activities accomplished by distance learning have also the possibility of participation in traditional meetings with the teacher. The role of traditional meetings can be very different: they can be used to deliver the most important part of the knowledge, the e-learning meetings will be used to introduce the didactic process, or as a method fixing particular contents. The inverse model is also possible: traditional meetings will take place at the beginning and at end of the course and their role will be to activate a group and to sum up all of the didactic processes, while the basic contents will be delivered during distance courses. What model will be chosen is relative to the specifics of the target group, didactic needs, character of the course, the experience of teachers and students and (and perhaps first of all) the possessed budget.

Describing different models of e-learning solutions, it is important to mention also the approach where such solutions are used as the supplement, or extension of lessons led by traditional methods. In this approach, all of the

didactic process are conducted in the traditional model in which all didactic contents are delivered by means of traditional (not e-learning) didactic methods. E-learning solutions serve as support e.g. the knowledge of trainees can be tested by means of automatic tests; the teacher makes available the materials by means of the IT system in the electronic form (e.g. PowerPoint presentations), students obtain additional contents by means of technological solutions which supplement or extend lessons conducted traditionally, etc. It should be clearly marked that such a utilization of e-learning solutions is something indeed different from the approach presented earlier. Models introduced earlier have to replace the traditional model. The choice of such methods will influence not only the affectivity of the education, but are also different by calculating teacher and student work hours.

Characteristics of the target group

The training called 'Archaeological heritage in contemporary Europe' is addressed to the group of specialists working on problems regarding archeological heritage. This group includes professionalists in the sector of the protection of archeological heritage and other persons connected with this sector (planners, engineers, administration, etc.). Participants of the course can be also students interested with the subject matter regarding archaeological heritage protection. The model of conducting the distance course was elaborated mostly for the target group i.e. working persons. This results from the basic aim of the course – the elevation of the competence of specialists in these areas in which appear new techniques and methods. Of course the proposed education model can be also efficiently used to conduct training courses for students. However, if the students were the target group, the model of the distance education would be essentially different.

For adapting the model of distance education it was indispensable to regard the specificity of trainees to choose the most suitable methods of their education. From the methodology viewpoint it was essential that the following characteristics of the target group were followed:

- > The geographical dispersion – in Europe employees of the archaeological heritage protection sector are working in institutions dispersed over of the country. In countries with a large area, the distance between them can be large e.g. in pilot training conducted in Poland, participants were persons working in Przemysl, a city which is about 600 km from Poznan, where there were teachers;

- > The lack of time – training is addressed to persons who because of their busy professional activity have not much spare time;
- > The lack of the possibility of a comparison of experiences with other specialists from the same field – the geographical dispersion and the fact that specialists working on the archaeological heritage protection are often only specialists in the environment where they work, does not give the possibility of confronting personal problems and needs with other specialists from the same field.

From above results directly that:

- > In the training process there is no possibility to organize traditional meetings, which excludes the blended learning model;
- > The form of education must be attractive, not to give to participants having at his/her disposal with the small quantity of time the argument regarding leaving the course because of a 'wearisome' formula, this statement encourages to conduct courses with the use of multimedia in which at a suitable approach it is possible to obtain an attractive product for the trainees;
- > The lack of the possibility of opinion exchange with other specialists from the same field stimulates the introduction of solutions giving the possibility to conduct discussions from distance by means of discussion forums.

The project model of education

The wide range of the possibility regarding the organization methods of a distance e-learning course in the internet environment and the character and expectations of the target group had led to the proposal of modeling and conducting the didactic process with the following characteristics:

- > Web-based training – training is intended to be conducted in the internet environment, for the general accessibility of this medium;
- > facilitated e-learning – the didactic process will be conducted on the basis of didactic contents delivered in electronic form as multimedia and interactive e-learning courses. The role of the teacher will be supporting the didactic process and to activating learners, the chosen model will assure the homogeneous level of the instruction thanks to aggregated content in the form of e-learning courses adapted also to the temporary accessibility of the course participants;

- > multimedia and interactive e-learning courses, in other words didactic contents organized in such a manner that give the possibility of the replacement of interactions between the teacher – the trainee through the interaction didactic content – the trainee, solution chosen to activate persons learning through an attractive form;
- > the lack of traditional meetings – the lack of the possibility of the organization of meetings of this type because of geographical dispersion and the large workload of the target group;
- > communication in the course is fully asynchronous, to give to trainees the possibility of work chosen by them in available time and convenient place;
- > the possibility of opinion exchange on the discussion forums to give the possibility of confronting practical knowledge between course participants and as the essential element of the trainees stimulation.

Tools used in the distance learning process

Model accepted for the course regarding leading the didactic process extorted to choose particular tools and technological solutions. These tools included:

- > A package of 15 multimedia e-learning courses;
- > The LMS/LCMS system supporting the didactic process conducted by distance;
- > Access vortal;
- > Syllabus.

Multimedia e-learning courses

In compliance with the accepted methodology for conducting the distance didactic process i.e. assisted e-learning, didactic material in electronic form constitutes the basic element around which all training activities are led. According to what we said earlier, the basic activity of the learner is oriented on independent work with material; remaining activities (work on the forum, essays, and consultations with the teacher) are always realized in connection with the contents delivered to the trainee in a multimedia and interactive e-learning course. The decision in which form the essential contents will be provided to learners influences essentially the efficiency of the whole didactic process.

For the purpose of reaching the best effects the authors decided that

didactic contents would be delivered to learners in the form of multimedia and interactive e-learning courses. Multimedia and interactive e-learning courses (multimedia e-learning courses or e-learning modules) are such, that organizing the content in electronic form is the most suitable to conducting the courses in the WBТ model. Such courses are built in a form invoking the delivery of the information on the internet i.e. in the form of the utilization of multimedia and interactive elements. The courses are built in technologies which are intended to starting the web browsers as DHTML (dynamic HTML) or flash technology. Particularly by multimedia e-learning courses we understand the organization of the didactic content which possesses the following characteristics:

- > The course contains multimedia and interactive elements enlarging the attraction of delivered contents and enlarging education efficiency;
- > The course has a hierarchical structure adapted to the internet education needs, realizes the rule of the partition of the content on independent units of the knowledge so-called Learning objects;
- > The course is prepared to upload in the learning management system through recording it in the popular standard of the didactic content representation e.g. SCORM.

Multimedia and interactive elements in the e-learning course should always determine the supplement and the enlargement of the essential content. They should never have the entertainment function separated from the narration led in the text. They are introduced for the visualization of dynamic processes, phenomena, or illustrate dependences between issues discussed in the processes (Carliner, 2002), (Horton, 2006), (Kemp *et al.*, 2004). Learnedly by means of elements of this type permits the learner to participate in interactive simulations i.e. learning by doing. In most situations these elements serve not to be a linear introduction of the content. They can be also put onto building elements making possible self-testing of the knowledge of the learner and testing of this knowledge as eg. simple single/multi choice tests, but also as complex simulators testing and invoking the character of the content delivered in the course (e.g. simulators of the control of particular tools).

The production process of the multimedia e-learning courses differs essentially from the simple digitalization of texts being seized of meritorious specialists and make available as e.g. files in pdf format. Such courses are in

fact the 'electronic books' which permit the learner to enter into interaction with the essential content in compliance with the algorithm designed by the author. This kind of interaction in the multimedia e-learning course in the situation in which the learner works with the course individually in the asynchronous mode takes place with the interaction on the line trainee – teacher met in the traditional class. The accessibility of the interaction in the e-learning course in an essential manner bears on the efficiency of the teaching. Attention can be returned also to learning by doing methods accessible in multimedia e-learning courses. Such a construction of a course fragments; the learner has the possibility of independent exploration of knowledge and experiencing it practically. This approach differs from the more 'passive' approaches in which the learner must enter fully into the style of the narration forced by the material e.g. traditional lectures recorded by video and delivered to the trainee. In the case of such organized lectures there is a lack of interaction with content, there is also no possibility of interaction with the lecturer as in the traditional classroom.

Discussing multimedia e-learning courses, it is very important to talk about their structure. Such courses should have a hierarchical structure organizing the didactic contents recorded in small portions of knowledge, so-called 'learning objects'. The hierarchical structure should be in the transparent and (largely) lineal manner when the contents are delivered to the learner. The construction of a course based on learning objects means, that the essential content is disjoined apart between small 'isolated' parts of the material which consist of the coherent whole for the embedment of their berths in the hierarchical structure. The construction of the course with learning objects organized into the hierarchical structure is essential for education efficiency. This happens because the learner rarely will master all the contracted contents in the course during one session (one approach). Such a person will stop working with the course because of professional and/or household duties, or the realization of other activities connected to the course, etc. In consideration of this fact it is essential, that after a return to the work with the course after a break, the learner should in an easy manner find himself again and could quickly start learning without the frustrating search of the content. The good structure of the course and the readable partition of material will improve this process.

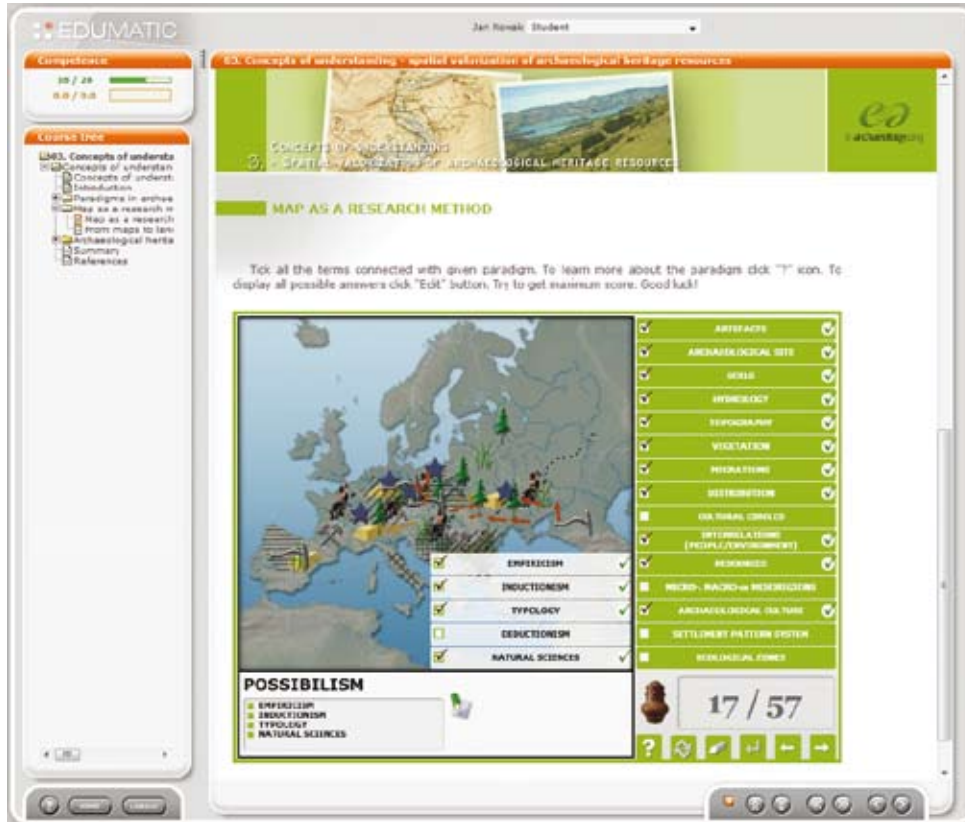
During the construction of the e-learning course it is important to decide, how to settle in the learning management system. Most simply will it be

recorded in the popular standard of the representation of the didactic content e.g. in the SCORM standard. Recording of the course in such a standard will assure the assignability between the LMS systems of different manufacturers, and will warrant easy maintenance (in the case of changes, this will be comparatively simple). Possible will be also the repeated utilization of each element of the course, if the author will acknowledge that the multimedia e-learning course should have other forms, e.g. if it is necessary to put into this course the components of other courses.

On the needs of the 'Archaeological heritage in contemporary Europe' distance learning course were built a package of 15 multimedia e-learning courses each have the characteristics quoted above (see Figure 1 and 2). The first version of the course was built in English, and then they were translated into the three following languages (German, Latvian, and Polish). Total 60 e-learning courses were built. Each course was recorded in the SCORM 1.2 standard, which guarantees the possibility of their actuation practically on every professional system supporting the process of education by distance learning. All courses were built in compliance with a philosophy of the division of content on learning objects. Part of the material contained in the single learning object demands from the trainee 5 to 15 minutes of work for mastering the purpose. Work with the single e-learning course should take from 1, 5 to 2, 5 working hours.

Learning management system – the system supporting conducting distance learning

In the simplified form the conduct of the distance training process on the internet would be able to be realized without the utilization of any dedicated software. In such an approach, it would be available to use the same tools and solutions which are used during the designing of web pages. Supported with such solutions the didactic process would consist of deliveries to trainees the didactic contents in the form of web pages. Such an approach has however a lot of inconveniences: the teacher would not have information of who uses what from his/her materials, would not know whether trainees who should participate in the course are really participating or not. Furthermore, the tools used for the communication would not be accessible in one place; there would be also no tools controlling the learning progress. To avoid the above mentioned inconveniences during the organization of a distance course it is important to take advantage of the dedicated system information technology



supporting the process, LMS (Learning Management System) with functions of the LCMS (Learning Content Management System) system. It is vital also to reflect over the manner into which the system will be started and maintained during the course. There are the following available approaches: it is possible to independently start the system of this type, or the start and the maintenance can be done by computer experts (internal IT department), or simply let this task be done by the external entity (external IT team).

LMS/LCMS system functionality

The LMS system supports the organization and the conduct of the distance didactic process in the following areas:

- > Users and process of training creation management;
- > Building, management and publishing of the didactic content;

Figure 1 & 2 Examples from the website www.e-archaeology.org



- > Didactic process management and progress monitoring;
- > Facilities of tools for communication.

The mechanisms of user management and the management of training creations allows to register users in the system and build training groups in the model similar to traditional courses. By the term training we understand the didactic process which ties the group of trainees, specific didactic materials and the teacher on the specific period of time. Flexible mechanisms of the training groups creation are especially essential in the situation in which one user of the system is simultaneously a participant of many courses. Flexible mechanisms of the training management are also useful in the situation in which the training is based on the precise schedule and specific parts of the course which should be made available to trainees only at a specific period of time. It is also important that the system should improve the individualizing process of the course for indicated trainees. In distance learning it often happens, that the student stands by compulsory time-limits. The lack of flexible mechanisms of the IT system can make it impossible to direct the trainee in such a situation on an individual path (e.g. the prolongation of the access to essential material for one trainee). In the didactic process conducted within the framework of the course 'Archaeological heritage in contemporary Europe' the flexibility of the trainees and course

management was very essential for the fact that training sessions had consisted of several parts; didactic materials and other resources (e.g. discussion forums) were provided to trainees at a different period of time and were not accessible all the time. Taking into account the complexity of the process (the courses were conducted in 5 countries in different periods of time, including different cultural habituates regarding the accessibility to the contents and resources of the course) without flexible tools of IT technology the management of the whole would be inconvenient.

Other functional areas of the systems supporting distance education are mechanisms that enable flexible building, management and publishing of didactic contents. It is very important, that the IT system allows making available content in the multimedia e-learning courses form, as well as being allowed in the distribution of all other materials in electronic form (Word files, pdf files, etc.). In the case of e-learning courses there is no need that they must be recorded in the standard of the didactic representation (such as SCORM) to be processed by the LMS system. The courses would be only organized as a pack of web pages and in this form would be provided to the trainee. This simplified solution would not be however profitable. The recommendation, that the LMS system has functionalities of the courses recorded in standards of the didactic contents representation, gets out of the fact that it gives this the possibility to launch such courses on platforms of different manufacturers (which in the situation of the aging of IT systems and the possible change of one system one second is very essential). First of all, such an approach gives the possibility to track the progresses of the trainees during the realization of such a course. Recording the course in the SCORM standard allows for huge possibilities.

During a discussion of the anticipated system functionalities for distance education in the area of content management, it is proper also to analyze the functionalities provided by LCMS systems (Learning Content Management System). While in a pure form this kind of system appears rarely, however, the functionalities of this class of systems are often met in systems for the distance education of the LMS class. One of the needs of this is the elaboration systems integrating functions of LMS and LCMS systems we will qualify as LMS/LCMS. To the essential functionalities of LCMS systems is the possibility of the creation of didactic content directly in the system and so organizing it according to requirements. This solution enlarges the possibilities of the LMS system, where the didactic contents are only processed as whole pack-

ages. LCMS systems give also the possibility of the transformation of didactic content on the large level of the granulation (e.g. on a learning objects level, or even on the level of learning objects elements). In the context of conducting the distance courses, the LCMS class systems functionalities can be for example useful in the situation in which it is indispensable to add to the imported didactic content (e.g. in the multimedia e-learning course) a new (other) parts of material.

Another functional area is the functionalities supporting the management of the didactic process and monitoring of trainee progress. These mechanisms let on the one hand to accumulate the information about a trainee's progress (but also about teacher activities) and to access this knowledge in the form of reports. Furthermore, the didactic process management is a mechanism supporting the learners activation e.g. control-work evaluated by the teacher, the mechanism of home exercises. A good reporting system should give the possibility of the inspection of progress of the trainee in a cross-sectional way. The reports about trainees logging to the system, progress in the realization of each parties of material (number of loggings into resources, time, etc.), the information about progress on group work (the time spent on forums, number of statements), etc should be accessible. Reports should be cross-sectional i.e. should show the progress of all learners in one training, or individualized for a chosen trainee. The flexible reporting system really will improve the work during the course supervision, and will give the possibility of the immediate responsiveness on progress (and in most cases rather their lack) of the trainee or groups of trainees.

The last functional areas of the systems for distance education are tools supporting the communication between trainees, and a teacher. In his kind of system there are integrated tools such as: the forum, chat, electronic mail, and calendar. Accessible are also often other functionalities such as video-conferencing modules (in the streaming technology), the screen sharing, news, etc. In the model of the training realized in the project were used two tools for communication: forum and news. The first tool gives the possibility of the discussion on a particular subject in the mode of asynchronous communication. This form of contact was introduced as an essential element of trainees being activated and giving the possibility of leadership on the discussion of subjects connected with the course. News is the functionality that gives the possibility to the teacher on informing the trainees about important events during the course (availability of the new course, the

beginning of the discussion forum, etc.). It is important, that the news mechanism would be managed directly by the person conducting the didactic process, i.e. by the teacher. The good utilization of the news mechanism gives the learner quick information hereof what he/she should perform on the given stage of the training. This information is accessible after the logging-into the system. Discussing the functionalities of the systems for distance e-learning, it also important to say a few words about e-mail. Most of platforms offer their own e-mail systems, however, it is preferable to use during the course e-mail addresses used by trainees on an everyday basis. Aside from which e-mail address will be used, one ought to mark that contact by e-mail is not excessively anticipated in distance training. This mechanism of communication should be used only to settle urgent and individual matters. The didactic process should be conducted in such a way, that most of the communication on essential subjects should take place in discussion forums, and the organizational information distributed to trainees (through the news mechanism, syllabus, dedicated forums) that trainees will not be forced to ask for important information by e-mail.

In the training a system for distance education called Edumatic was used which had described the above characteristics. In particular this system had the following functionalities:

- > Advanced mechanisms of the groups management and flexible mechanisms for course organization and individualization;
- > Processing mechanisms for multimedia e-learning courses in the SCORM standard (including SCORM 2004), including LCMS system functions:
 - Importing and the delivering e-learning courses in training sessions;
 - Possibility of the modification of courses imported to the system (e.g. creation of a new course based on courses founded in the repository, adding to courses ready to use tests);
 - Tools for the delivery to trainees of files in electronic form;
- > Tools for tracking the activity of trainees and for reporting purposes:
 - Activity of the trainee during the e-learning course (time spent in the whole course and each units – SCO, the time of the last entry in each unit of the course, number of visits, etc.);
 - Activity of the trainee on forums (time spent, number of statements);
 - General information about logging into the system;
- > Communication tools available as an inseparable part of the course:
 - Forum for asynchronous discussions;

- News to placing actual information about the course;
- Tool for the quick contact with trainees (such as e-mail messages);
- Calendar;
- > Tools for knowledge verification:
 - Tool for managing homework exercises by trainees in a definite period of time;
 - Tool for the self-testing of knowledge, in the situation when it is needed that students can check their knowledge by answering multiple choice questions with yes/no answers;
 - Tool for examining the situation in which the progress of trainees should be evaluated by the teacher;
- > Tools for group work – space for file exchange between trainees.

Models of LMS/LCMS systems delivery

An important decision which must be made before the implementation of the e-learning solutions is the decision regarding which rules will be followed and maintained in the technological platform of the system. Implementation and maintenance of the learning management system, the same as implementation and maintenance of every other IT system is a sensitive undertaking and requires very careful decisions. There are three accessible solutions:

- > Standalone implementation of the platform on the possessed computer hardware and the maintenance of such a platform for the needs of conducted courses;
- > Entrust this task to the IT teams of the mother institution;
- > Entrust this task to the external subject entity.

The first solution seems now to be very attractive for many people anxious to start distance courses and possessing a little more than the basic knowledge about handling information technology systems. This attraction is strengthened by the fact of the accessibility of many systems for distance education distributed on an open-source license. The easy accessibility of such software means that it equally seems simple to understand the implementation and the maintenance of such a system. However, this is very wrong! Even if the system is efficiently installed, it does not quite mean that it is already ready to use for work. The system can be found properly prepared for conducting the course, if is properly scaled and configured (e.g. in respect of safety), as well as having suitable maintenance procedures (e.g. data backup). If we do not

think about these aspects, in the case of system failure or equipment failure (what happens often) and consequently of the lack of access to resources of distance courses, or data loss about the progress of trainees, the didactic process can be disturbed or simply break down. It is correct to reach for a second solution or even third one. Qualified specialists will take care of scaling the system i.e. to prepare the system to handle a planned number of trainees and properly configure it (e.g. they implement the suitable data security level). Such teams will be also responsible for data backup, and will start the system in the situation when technical problems appear (e.g. in the case of hard disc damage, database crash, etc.). Whether the implementation and the maintenance of the system will be entrusted to IT teams from the mother institution or 'external' entity is relative to many factors. In the situation when access to a distance e-learning course is realized via the internet, it is not important where the IT system is located.

During training sessions the third approach was used, i.e. all partners conducting the courses in the project (Germany, Sweden, the Netherlands, and Latvia) have used technological solutions physically located and operated in Poland (Adam Mickiewicz University). For the final participant of the course it was not an important matter. The technical support was also organized centrally in Poland and delivered to all six partners of the project.

Access vortal

Starting a distance e-learning course it is proper to consider the actuation of the additional tool of information technology – vortal. Vortal is a place in the internet which for course participants is the place of the access to a distance e-learning course. The role of the access vortal is:

- > The log-in to the e-learning platform (LMS/LCMS system, or other);
- > Make available information about the course (schedule, landmarks, etc.);
- > Make available all the information concerning rules of using an e-learning platform.

Within the framework of the project, access vortal for participants of the course was the vortal located on the internet domain: www.e-archaeology.org (see Figure 3).

Figure 3 Interface showing homepage.



Syllabus (training scenario)

The syllabus (training scenario) is the document containing all indispensable information for the trainee concerning the distance learning course. This document should be delivered to the trainee before the beginning of the distance course. The trainee should use it all the time during the course, always when the course enters into a new phase, when something is for him/her questionable, when technical problems appear, etc. The document serves so as a support for the working trainee, who is unable to ask questions directly during traditional meetings. It also improves the work of the teacher – if essential information for the trainee is not found in this document (eg. date of the return control-work), the teacher can expect a large number of questions on the same subject from different trainees. At adapting the syllabus it is important each time to learn what type of information will be most essential during the course, remembering that a trainee working individually may feel helpless, when there is no essential information delivered to him/her, or in case of technical problems making it impossible to find such information located only in the IT system. The syllabus should contain the following information:

- > Information concerning the aims of the course and the competence level which the learner will acquire after the end of the course;
- > Requirements which must be fulfilled by the trainee so that he/she will be able to take place in the course (essential requirements, e.g. credits from other courses, familiarity with the use of word processor and technical, e.g. having a specific type of web browser);
- > Organization of the course with its legible division in parts (if such appear) and with the indication what resources the learner will use during each part of the course (e.g. the indication of e-learning courses names, discussion forums, etc.);
- > The course schedule with the indication of exact dates of the beginning of each parts of the course and dates on which will be available all resources on the basis of which the course is conducted;
- > Rules of the acknowledgement of the instruction is finished, in other words the information regarding what the trainee must perform to finish the course (e.g. familiarity with essential materials, participation in the discussion forums);
- > Information on rules of the credit (points and for what);
- > Rules regarding participation in the training:
 - Information regarding when each parts of material will be available;
 - Information regarding rules of communication (e.g. whether the trainee has the right to use e-mail and in what cases, what is the warranted time on the answer, where the information will be available, if in the schedule changes, etc.);
 - Information regarding rules in an emergency (e.g. the qualification of this when the trainee should acknowledge that the error of the platform appeared, the rule of conduct during the emergency situation);
- > Contact information to teachers and to the technical support team.

The syllabus can be constructed as a document in the electronic (pdf, word) form provided to the trainee before the beginning of the course, or as a resource available on-line, e.g. on an access vortal. Aside what technical form will be chosen and what the trainee should have accomplished to use the syllabus in the situation in which doubts of an organizational or technical nature appear.

On the needs of the 'Archaeological heritage in contemporary Europe' course syllabus which consisted of six documents was produced:

- > The base document determining the general frame of participation in the course;
- > Detailed documents, one document for each part of the course.

Such a partition of a syllabus issued, that the course had been divided in parts and because before starting the course one foresaw possible (small) changes in the schedule of the course. The course had a pilot character and there were possible small time displacements in the realization of each of the part (which in reality took place in small cases). Before the beginning of the first part of the course was delivered the base document and detailed syllabus for the first part of the course, and before the beginning of every following part of the course was provided in the syllabus concerning the guidelines of the work for this particular part.

It is important to point out, that on the needs of the course were elaborated separate syllabuses for each partner countries. They differed not only with appointed times and dates, but also with the methods of calculating points and with information of how to make the content available to learners.

Tools and education methods in the 'Archaeological heritage in contemporary Europe' distance learning course

The tools and methods described above were used in the 'Archaeological heritage in contemporary Europe' distance learning course. They were applied in such a manner, to superlatively take into account the specificity and needs of the target group and to guarantee the best educational effects. The foundations concerning the didactic process in the distance learning course are the following:

- > The didactic process is realized through the internet in the Web based training model in the assisted e-learning mode, i.e. the teacher supports the course, and is not a source of knowledge;
- > A central point of the course is the didactic material provided to trainees in the multimedia and interactive e-learning courses;
- > In the didactic process the teacher can use as a supplement other essential materials taking into account the character of the trained group, including the condition of the country where the course is being conducted;
- > The training is realized and based on the system supporting distance education – LMS/LCMS system;
- > An inseparable part of the course are forums, writing of essays and

consultations which have to activate trainees and support them in the learning process;

- > Progresses of the work is monitored by the teacher;
- > The lack of traditional meetings during the course;
- > The whole process of education is supported by distance learning; specialists and technical staff responsible for the maintenance of the IT infrastructure.

Organization of the course

The distance e-learning course operates under the name 'Archaeological heritage in contemporary Europe'. It was elaborated in such a manner so that it would be able to be conducted in six countries (Poland, Germany, Latvia, the Netherlands, Sweden, the United Kingdom), in four countries it would be conducted in national languages (Poland, Germany, Latvia, and the UK). Considering the good knowledge of English in the target group in Sweden and the Netherlands, essential materials would be available in English. The activities realized by trainees during the course were defined in such a way, that the duration of the course could be different. This is why the pilot course lasted from three months (Sweden) to six months (Poland). Such a need of flexibility within the range of the course duration issued different habituations and specifics of institutions starting such courses in different countries of Europe (the different courses will then be conducted within the framework of enrolling them into the program of studies in colleges, and other institutions when the instruction will have a character of vocational training, countries differ with the mode of the organization; the semestrial, trimes trial mode, etc.)

The whole course was divided in five parts. This division resulted from the specificity of the material (for the detailed description of the course – see A. Marciniak in this volume). The course was conducted basing it on the following resources and activities:

- > 15 multimedia e-learning courses;
- > 3 discussion forums;
- > 2 essays (one collective, one individual).

For the purpose of the legible information of course participants that the work with each resources and activities of the course has a character of regular classes (though the learning environment is different from the

Part	E-learning courses	Forum
Part 1 Theory of archaeological heritage	2	1
Part 2 Mapping of archaeological heritage resources	4	
Part 3 Valorization of archaeological heritage	2	1
Part 4 Protection and management	4	
Part 5 Politicizing archaeological heritage	3	1

traditional one), and not the free and obligors look over the contents (what the internet usually does) were introduced readable names for each activity of the working trainees in the distance course. The following names were introduced:

- > Asynchronous distance lecture – individual work of the trainee with multimedia and an interactive e-learning course;
- > Asynchronous distance conversation – collective work of trainees at the discussion forums;
- > Asynchronous collective homework – collective work of a group of trainees on a given subject aimed at writing an essay;
- > Asynchronous individual homework – individual work of the trainee on a given subject aimed at writing an essay.

Trainees had also the possibility to use individual consultations with the teacher through e-mail contact.

Trainees accessing to the given part of the course obtained access to all resources assigned to this part. However, not all resources were available at the same time. For example, if in the given part of the course were available several multimedia e-learning courses, they took place in definite distances (eg. one course every week, or every two weeks two courses). Similarly with access to the forum – the discussion should begin after the perusal of trainees with essential contents delivered in multimedia e-learning courses, in other words, mostly some time after the beginning of the given part of the course. Rules regarding availability of the resources in the course were different in different countries depending on the duration of the whole

Table 1 All activities during the course were available in each part of the course.

course. The trainee, for familiarization with a multimedia e-learning course had about one week, similarly with the discussion on the forum – assumed optimum – time is about 10 days.

An essential matter from the organization of the course point of view was the problem of access to resources expiring of the given part of the instruction after the course end. This problem was dissolved in different ways depending on the habituations of the particular training group and cultural conditionings. There were a possible two solutions in this regard: expiry of the access after the end of the given part of the course, or availability of resources also after the end of the particular part of the course. The first solution can be treated as the essential element of trainees activating. The rigor of making the trainee available to the resources he/she is forced into systematical work. This solution is recommended in the situation in which the duration of the course is relatively long – then mobilizing the students is essential. This solution was accepted during the course in Poland – the access to all resources expired after the end of the given part. Of course in the situation in which some trainees did not finish the work on time, the access was prolonged. However, this was always done individually and introduced to the trainee as just an incidental circumstance. In such a situation the access was prolonged for approximately 2 weeks. The lack of access to resources expiring is more optimum, in particular in the situation in which the course is relatively short and trainees will have delays in the realization of material. However, in such an approach there is the risk of leaving the course by trainees because the effect ‘of too large an amount of outstanding work’. Aside from which solution will be chosen, essential is that the teacher will be commended over the process of accessing the course material. During these activities are useful good IT solutions for the automation of the access to the course resources process. This happened in the case of discussed courses – the access to the course resources management took place automatically after the initial configuration of the mechanism of the Edumatic platform. Despite this automation, the teacher could always depend on the needs of individuals to access the course resources, e.g. in case of trainee delays.

Trainees activation and role of the teacher in distance learning

The accepted education model, in our case assisted e-learning, forced to propose the certain manner of the trainees activation who issues form the character of a driven didactic process and are adapted to the potential of used

tools. Similarly, the role of the teacher in this type of course is essentially different from the role played by him/her in the traditional class, but also different from this which the teacher plays during the leadership of distance learning courses in the synchronous model.

Role of the teacher in distance learning

The role of the teacher during distance led learning according to the assisted e-learning model in the ‘Archaeological heritage in contemporary Europe’ course is as follow:

- > Monitoring of trainees progress with work with e-learning courses and progress of the discussion on forums
- > Beginning of the discussion on forums and the supervision of this discussion
- > Valuation of individual and group essays
- > Conformance with the work schedule and responding in the case of delays
- > The trainees activation

The monitoring of the learners progress is one of most essential activities of the teacher in the case of the assisted e-learning model. This kind of activity should be realized systematically and exactly. The correct analysis of the trainee will permit the teacher to determine the degree of participation of the trainee and the beginning of taking part if such an activity is necessary. For good monitoring of the trainee progress is very essential together with the support which is offered by the LMS/LCMS system. The more detailed reports the system offers the better. Also important is that reports give cross-sectional information on two surfaces: the information concerning a single student and information about the whole training group.

In the discussed course, for the trainee’s progress monitoring purposes were used following reports offered by the Edumatic system:

- 1 Progress of trainees in the realization of the multimedia e-learning course (information available for a single trainee: the number of entries to the course, globally spent time on the realization of the course, the date of the first entry, the date of the last entry)
- 2 The activity of trainees in the realization of the forum (information available for a single trainee: the number of entries to the forum, the time spent on work on the forum, the date of the first entry, the date of the last entry, the number of the statements made by the trainee)

- 3 Progress of trainees in the learning object (information available for a single trainee: the time spent on the work in a given learning object, the number of entries to the learning object)
- 4 Progress of the trainee in the realization of all courses in the training (the following information was provided for the single course: the number of trainee entries to the course, globally spent time, the date of the first entry, the date of the last entry)
- 5 Progress of the trainee in the realization of learning objects for the chosen course (the following information was provided for each learning object: the time spent on the learning object, the number of entries to the learning object)

The above described and allowed for the systematical analysis of the trainees progress. Each time the analysis began from report 1 for the analysis of progress in the realization of multimedia e-learning courses and report 2 for the analysis of progress regarding work on forums. These reports showed the engagement of trainees: from the number of entries and amount of the time spent on the work resulted univocally who works more, and who less intensely. A deeper analysis for progress of the work in the multimedia e-learning course provided report Nr. 3. This report helps to analyze how the trainees worked in each learning section of the course. This allowed the teacher to get to know which learning objects are more, and which are less intensely studied by trainees. In the case when the teacher had a suspicion (after the analysis of reports 1 and 2) that the student did not work systematically, or simply wanted to check the progress of the chosen trainee he used report Nr. 4. This report permitted to check, that the student quit the work only in one multimedia e-learning course (if it happened), or in several. The very interested analyses provided report Nr. 5. This report allowed to check that within the given course, the trainee had worked systematically (e.g. showed whether times spent on the study following learning objects was similar) or not.

In case of discussion forums obviously alone monitoring, in other words reference only to the quantitative information, was inadequate. The role of the teacher was also the substantial supervision and moderating discussion on forums. In the discussed course it was accepted that the role of the teacher was the initiation of the discussion on thematic forums through placement on them with several threads with themes for the discussion. These themes determined the crucial element of the essential layer of the whole course.

Each one from teachers leading the course should formulate such theme in one thread on the forum into such a manner, that would be interesting, stimulate the discussion and invoke experiences of the training group and the context where the course is conducted (e.g. he complied with local/national conditionings). During actual work on the forum the task conducted by the teacher consisted of:

- > Moderating the discussion, including teacher involvement into the discussion as a specialist from the field explaining certain matters, summing up certain plots, or placing new (sometimes controversial) theses, if such action was necessary
- > Controlling the level of the discussion and maintaining the regulations of the forum – controlling that trainees do not use censurable words, whether the discussion is on the subject, whether it is driven within the framework definite by the teacher (e.g. whether students do not create new topics – in the pilot course this was not permitted – the discussion had to refer only to themes indicated by the leading teacher).

Within the framework of the course, the role of the teacher is also to evaluate essays (individual and group). The beginning of writing essays (in the discussed course there were a total of two essays) was determined in the syllabus, the teacher should signal this also by an e-mail sent to the trainees. An interesting problem to dissolve was the manner by which one should have to form groups for writing the group essays. In the pilot course in Poland this problem was solved in such a way, that students could on the dedicated forum show by their own preference regarding with whom they would like to write the essay (students 'knew' already virtually after a few discussions on the forum). Later, groups were formed by leading teachers. The return of essays to the teacher for evaluation could be realized by trainees by means of the homework functionality of the Edumatic system (this functionality improves the process of handling big numbers of essays, and gives the possibility to control the maintenance of terms for sending in essays), or by e-mail. This last solution was acceptable when training groups were not large.

An important area of teacher activity in a distance learning course is watching conformance with the course schedule by trainees. From the continuity of the didactic process point of view it is essential to fulfill all terms prescribed in the syllabus. If some changes took place relating to terms described in the syllabus, the teacher was liable for informing trainees about

those changes. Accordingly, what was useful was the functionality of the Edumatic system called 'Contact with trainees' which gave the possibility to send short text messages to all (or chosen) trainees who were on the course. The exercise of this task by teacher's e-mail is sometimes inconvenient; especially in the situation in which the group of trainees was dynamic because of the dropping out of trainees from the course (e-mail messages should not be sent to trainees who dropped out from the course). In the case, when the trainee was not able to finish his/her tasks, the teacher could individually decide what should be done further. First, he/she should activate tasks, and later, if there was a specified reaction from the student, he/she should e.g. extend the access to particular resources. In this last task in most cases teachers were supported by the support team who performed these operations in the systems.

Trainees activation methods

To provide effectiveness to the distance learning process, an essential task of the leading teacher conducting such a didactic process is activating the learning persons. Conducting a distance learning course in the asynchronous mode is always threatened by the fact that the trainee can always resign from the course. The reasons can be different: the lack of direct contact, confusion consequential from the delusion of freedom during doing work at any time, the lack of motivation in the form of regularly conducted classes in one term, or such factors as resigning from courses conducted with traditional methods. During the remote instruction the teacher will have a rest so the responsibility is too quick for identifying threats of this type and the collection of activities which have it to minimize (Collision *et al.*, 2000). Paradoxically, the work on distance with the support of good IT solutions gives the possibility of a better estimation of trainee engagement in the learning process than during traditional training (the impression can be very wrong). If the teacher diagnosed already particular threats by means of the tools and methods described in the previous chapter, he/she has for their own disposition a set of tools for activating learning persons. In the discussed course reference to following methods was recommended:

- > Sending e-mails with the current information about the training, that which besides an informational layer, that had to hold up the interest of the trainee with the course;
- > Sending e-mail warnings in the situation in which was founded the

assumption that the trainee does not work systematically, or works too superficially, this type of e-mail informs a trainee, that the teacher is aware of the lack of progress in the learning process and that more work is needed;

- > Sending 'the last chance' e-mails to these trainees who did not complete some specific criterion for the training (e.g. did not know the content of the multimedia e-learning course in the established time frame) with information that they have the last possibility to complete the tasks (e.g. they received two additional weeks to finish their work);
- > A telephone conversation with the trainee – this form of direct contact will make the communication easy and will allow to get to know the manner about the approach of the student to the didactic process;
- > The activation by use of superiors – the most simple manner of the activation, if possible;
- > Improving the attraction of the discussion on the forum, in the case where this is the only way of opinion exchange, the attraction of these discussions will be essential motivation for the trainee;
- > Individual consultations – the possibility of asking questions will be attractive for these persons who do not have experiences, or are worried about public discussions on forums.

Each of the above described manners for learner activation should be started with exceptional caution. The lack of direct contact with the trainee makes it difficult to recognize his/her degree of engagement and motivation. A recklessly formulized message received by electronic mail can in specific situations cause an adverse effect. The most quoted above methods of activation do not need to be realized by the teacher. If possible, he/she can work with help of the assistant. However, in such a situation, the teacher as a person responsible for learners always has to make a decision about criteria according to which activating tasks will be undertaken.

Support for distance learning

During the process of distance learning education what is very important is support to all actors of this process, i.e. trainees and teachers. This support refers to different problems, and that the leadership and the participation in the distance e-learning course is a new experience which is not always straight forward for the trainee and the teacher. Speaking about support, it is

important to take into account the fact that a good course depends also on the reliability of previously used IT solutions. This last aspect demands full technical support. Described below are all of the support elements offered during the pilot course.

The support for students during the distance e-learning course consisted of:

- > Delivering to the student full information about the course and term times, scores, etc. in syllabus form;
- > Delivering the instruction regarding the configuration of the web browser and class-book of the QuickStart type explaining how to use the IT system;
- > Indication of contact with the support team in case of technical problems (e-mail, telephone, dedicated forum);
- > Indication of rules regarding contact with the teacher in case of doubts of an essential nature, or connected to the organization of the course.

The support of the teacher embraced:

- > Training regarding operation of the IT platform and the methods used during the distance training in the accepted methodical model;
- > Support in the area of the methods and the use of tools;
- > Indication of the contact with the support team in case of technical problems (e-mail, telephone, dedicated forum).

In order for the distance learning course to be efficient it is essential that the used IT systems must work in a continuous and proper way. However, it is difficult to demand full reliability from the software and the equipment. Technical problems are a norm and not an exception and everyone has to prepare for these problems. To minimize all the threats coming from technical problems is the elaboration and implementation of the specific maintenance procedures. Consignment of the IT systems maintenance to specialists will guarantee that suitable operations will be realized unbeknown and the participation of persons responsible for didactics. This will permit the avoidance of disturbances, or even breaks in the didactic process because of technical problems. In extreme situations problems of this type can be reasons for leaving the course of remote instructions by discouraged students and teachers.

Activities of the technical support which should be implemented:

- > Systematical backups (minimum once a day) of the system and data;

during the course there are inadmissible situations in which after damage e.g. to the hard disk or lost parts of the work of students and information on their progress in the course;

- > Assurance of a suitable level of data security;
- > Readiness to undertake remedial activities in the event of a system failure e.g. the starting of the backup system;
- > Actual inspection of the systems efficiency and undertaking of remedial activities in a situation in which the given IT solution is not effective.

Rules regarding the creation of multimedia e-learning courses

During the organization of distance e-learning courses using the model where the didactic content constitutes the central point of the course, it is important how the decision concerning this content will be transferred to electronic form. We have to find answers to the following questions:

- > Whether the didactic content of the course should be prepared in some special manner depending on the needs of the electronic form;
- > How and by whom the transfer process of the content to the digital form should be realized.

Answering the first question, it is important to take into account the following possibilities:

- > Materials in electronic form are prepared through the simple digitalization of materials already being in the possession of their author (e.g. from teacher word files will be created pdf files, pictures possessed by the author will be scanned, etc.);
- > Materials in electronic form are prepared through the digitalization of materials possessed by the author supplemented by the new elements created on the needs of the digital form (e.g. elaborations of the teacher will be made attractive through adding photos, drawings, hypertext navigation, etc.);
- > Materials in electronic form are prepared on the basis of the didactic contents adapted specially for the needs of electronic elaboration.

In the last case the author creates (adapts) the contents in the way fully satisfied with the specificity of the chosen digital tool e.g. contents created for the needs of video-conferencing lectures will be other than contents built

for the needs of a multimedia e-learning course. In the case of building multimedia e-learning courses practically only the last solution should be considered. If in such a course there has to appear interactive elements (e.g. interactive demonstrations, quizzes, etc.) it is not possible that contents organized in a suitable manner can be in the possession of the author before the beginning of the creation of such a course.

Choosing the solution concerning how and by whom the didactic contents should be transferred to digital form, two possibilities have to be considered:

- > Creation of the content in electronic form will be realized by a specialist, the author, by means of dedicated tools;
- > Creation of the content in electronic form will be realized by the dedicated team working for the needs of the specialist.

The first solution seems to be attractive in consideration of the fact that at the present moment on the market there are many accessible labor-saving tools. In this approach the author is individually responsible for the form of the final product e.g. multimedia e-learning course. The tools dedicated to the production of multimedia courses have a set of predefined mechanisms that helps to build the numerous interactive elements (quizzes, demonstrations, placing and removal of photos, etc.), exporting the course in the SCORM format, etc. Such an approach is especially promoted by software manufacturers of this type and by numerous 'hot heads' that mastered such tools on more than the elementary level. However, this solution has numerous inconveniences:

- > Many specialists do not have the sufficient art and design talents that created courses which were aesthetical and ergonomic;
- > Many authors do not have the sufficient quantity of time to elaborate the content in this form;
- > Many authors simply do not want to deal with problems not connected to their basic competences.

The attempt of encouraging authors to use tools of this type in the situation in which we want to build professional multimedia and interactive courses reminds the attempt of encouraging the author of the book to individually provide illustrations, with the composition and the guarantee of good quality of print. Of course in many situations it is possible to create courses by means of such tools. However, it is important to remember, not to obtain

products on the 'copying-' level, because e-learning courses of poor quality will discourage trainees to the teaching themselves.

The second approach premises that the efficient production of multimedia e-learning courses should be based on the inclusion into these process professionals from different areas. In this model are distinguished:

- > Author of the course;
- > Instructional designer;
- > Executive teams.

The author of the course is a specialist who is responsible for:

- > The preparation of the essential content in such a form to meet the specificity of the multimedia and interactive e-learning course;
- > Acceptance of didactic resources and their form;
- > Inspections of the didactic correctness of the content in created multimedia elements.

Instructional designer, this is a specialist experienced in the designing and building of multimedia e-learning courses. He/she is responsible for:

- > The settlement of the structure of the e-learning course (the partition of the author's material on learning objects);
- > Proposing to the author the initial partition of the material conforming with accepted methodical foundations and (possibly) technical limitations;
- > Determining the degree of interactivity of the e-learning course;
- > Determining the technical parameters of the e-learning course taking into account the technical conditioning in which the course will be implemented.

The executive team is a team of professional graphic artists, computer scientists, multimedia specialists who are responsible for the construction of each element of the course designed by the author and instructional designer.

The advantages coming from the e-learning course construction by means of this method include:

- > Comparatively small work load for the essential specialist (author) with the production of the course, his/her role greatly involves only the elaboration of the content and to giving professional advice for the instructional designer during the project process;

- > Possibilities of building e-learning competence in the given organization by the instructional designer;
- > The possibility of the optimum usage of executive teams; in extreme cases during the construction of the following courses will be appointed completely different teams (technology development causes that competences acquired quickly become stale).

Creation of e-learning courses with such a method must be accompanied by a suitable budget. Unfortunately, the creation of good e-learning courses is expensive.

All courses created on the needs of 'Archaeological heritage in contemporary Europe' training were created conforming to the model of duties division between the author, instructional designer and executive teams.

Summary

The above described methodology of the distance didactic process and rules of e-learning solutions usage in the 'Archaeological heritage in contemporary Europe' distance learning course were elaborated with regards to the needs and habituations of persons working in the archaeological heritage field. The proposed technological solutions included the latest trends in distance education and were chosen in such a manner to best support teachers and students during the distance learning process. Proposed solutions were verified during the pilot courses conducted for target group representatives in five European countries taking into account different timeframes, organizational and cultural conditionings. Accepted methods and solutions will be able to be successfully used during distance e-learning courses regarding archaeological heritage also in other European countries as far as the course participants will be in a position to work with didactic materials in one of four languages in which these material were created (English, German, Latvian, and Polish). In the course specific technical solutions were used (LMS/LCMS Edumatic system) and held only on the needs of these courses. However, the whole model was elaborated in such a manner that the course could be run not only on this platform, but also on many other LMS/LCMS systems. Very essential is also the fact that these systems have to realize requirements indicated as essential from the efficiency point of view. The solutions introduced in this paper were created on the needs of one particular course i.e. 'Archaeological heritage in contemporary Europe'. However, the elaborated

methodology has mostly a general character that after the creation of suitable didactic materials in the multimedia e-learning courses it will be possible to conduct distance courses also on other aspects of archaeology and heritage protection.

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04

Evaluation of the course 'Archaeological heritage in contemporary Europe'. Survey of students' questionnaires *Andris Šne*

Among the aims of the project 'Archaeological heritage in contemporary Europe' was also a thorough evaluation of the e-learning course content and results of training in all of the participating countries. In order to reach this aim the questionnaire was prepared and everybody who participated in the course was asked to fill it in and give responses to several issues related to the organization, content, technical side etc. of the course. The questionnaire consisted of 67 questions. In this paper, the survey of questionnaires from the Netherlands, Sweden and Latvia is offered. Altogether 25 questionnaires were compared – two questionnaires came from the Netherlands, five from Sweden and 18 from Latvia. The different number of questionnaires received from different countries does not allow to make a reasonable comparison of responses among the countries and thus further they mostly will be treated together.

Altogether, in the discussed group of trainees participated 11 females and 7 males from Latvia, 5 males from Sweden and two females from the Netherlands. The average age of students ranged between 22 and 29 years, although there were also participants at the age of 44 and 66 years. Almost all of the course participants were students (i.e. 8 students from Latvia) while some of them were employees of museums, archaeological firms or heritage institutions. It is interesting to note that this course was taken also by a holder of a Ph.D. in physics and previous head of a school.

The received questionnaires make it clear that participants had decided to take part in this e-learning course to improve their skills or simply as a matter of curiosity. Only seldom it was mentioned that the interest in the course would relate to current or future job prospects. Most of the students had learned about the course through advertisements at their universities, while

some had found the course via the internet. It was the first e-learning course for most of the participants and only five of them had previous experience with e-learning. It is not so often when universities could have a possibility to offer courses prepared by an international team of scholars, and that might explain why almost half of respondents replied that their decision to enrol in the course was influenced by its international character.

Participants of the course usually were satisfied with its duration as well as the scope of discussed issues. Different opinions were expressed concerning the changes that respondents would like to make in the course but most of them were satisfied with the amount of theory in the modules and activities in the discussion forums. Several participants would have liked to have seen more exercises in the modules and also more possibilities for their own individual work.

The themes of the modules were treated as very interesting or somehow interesting by the course participants. Among the modules which students liked the best they named actually all of them but with some preference of, for example, *Theorizing cultural heritage*, *Geographic Information System as a method of management of spatial data*, *Images of the past*, *Cultural biography of landscape*, *Methods of engagement, publicity and media relationships*. But it shall be noted that at the same time almost all modules were named among those which students had disliked (while some students politely indicated that they liked all of the modules). The same situation applies to the questions about the modules that required the largest and smallest effort from students. A similar situation is reported as regards evaluating the modules from a technical point of view. They were evaluated in a very similar way which implies that subsequent modules were similar as regards their structure.

Some participants indicated that the first modules were particularly complicated due to the exposure to the previously unknown e-learning character of the course, but others had remarked that these were the modules with theoretical issues that demanded more time from their side. The dominant part of the students agreed that the course introduced new issues for them and that their content was understandable and the language was quite clear. However, opposite opinions were expressed to the questions whether subsequent modules were introduced in a proper order and whether the order of the modules were clear and straightforward.

Participants in the course had agreed that the knowledge and skills acquired during the course would be useful in their work and that those involved in archaeology would need to know these issues. The course content was considered as high (very high, high or rather high level) and the literature suggested for each module was usually treated as useful, interesting, appropriate and professional (while some indicated that it was also boring). Participants generally positively reacted to questions about the discussion forums and their meaning in e-learning while not all of them were satisfied with the writing of a group essay. It is interesting to note that students indicated their preference of individual work over collective undertakings. Very different figures appeared concerning the amount of time spent on the course. In general, students spent from 30 minutes to 3 hours working on each module while participation in the forum required 15 minutes, 30 minutes or even 2 hours daily. Most of the course participants admitted that the study of the modules were a more useful training method while some had also stressed the role of discussion forums.

The students generally held a positive view on the navigation through the modules and their interactive and multimedia features. The technical side of the course was also highly valued. But it appears that the syllabus was very seldom used and that almost everybody had met some technical problems during the course. Hence, it partly explains the opinion of several students who would prefer a traditional (academic) course if they had a choice to choose between traditional or e-learning solutions. Doubtless to say, this is also partly due to the limited experience with e-learning training in general but it is nice to remark that students see the future prospects for e-learning in archaeology (as well as in other disciplines). Students had indicated that e-learning has several advantages, such as organisation of their own study time, interactive character and discussion forums, use of new technologies, etc.

Most participating students indicated that this e-learning course (alongside training innovation) changed their view quite considerably about current and actual issues and themes in the archaeological heritage sector in Europe. They made it clear that they would use and apply the knowledge acquired in the course, even if they were not sure how and where it would happen. In this respect, for example, Latvian students were for the same time exposed to several topics, especially those relating to theoretical issues in archaeological

heritage. And that it is very much due to the international character of this course that allowed students to pay attention to contemporary approaches in archaeological heritage despite the fact that there are significant differences among participating countries as regards the practice and understanding of archaeological heritage protection and management.

05

Knowledge is just a 'click' away! *Katarzyna*

Marciniak & Agnieszka Chwieduk

Evaluation of e-learning course 'Archaeological heritage in contemporary Europe' among Polish participants

Introduction

The idea, to replace a real teacher with a machine or with artificial intelligence is slowly losing its own futuristic dimension. Radio, television, robots are the most well-known examples of this technical Odyssey. Today, also the Internet has joined this idea. The banal experience of many people, which is the everyday use of this mass-media means to help it the tool of education.¹ Naturally, this happens on various levels, also on an academic one. In this context, this is a good idea to raise a question for its real practical use. Thus, though in part to understand what 'e-learning' means, it is proper to ask groups who create this kind of learning tool and the rules regarding the operation of this method, perhaps accurately described as not the 'traditional method'?² *Last but not least*, what can we learn using this method and what are the possible results?

We will look at these questions in a very narrow range, because it is impossible that one text will contain a complete answer to them. An object of our interest is the international project called: *E-learning as a tool of knowledge transfer in the field of protection and management of archaeological heritage*,³ addressed to archaeologists from England, Latvia, the Netherlands, Sweden, Poland and Germany. The program is addressed to two target groups. One of them is related to the archaeological heritage protection sector ('AH') and to practicing archaeologists, planners, architects working often far away from large municipal centers, often having no contact with each other. The authors

of this undertaking surmounted against the necessity of the continuous improvement of professional skills of these people which because of place of residence have difficult access to latest trends in the discipline, first of all from the range of 'AH' protection – an essential matter in their professional careers. Furthermore, preparing an e-learning course, they not only just acknowledge and popularize their own disciplines, in other words archaeology and information technology, but will seek solutions for a better their application in didactics, especially at an academic level. This is why the second target group e.g. students of graduate studies, PhD and extramural studies, for whom the archaic program of studies did not assure the suitable theoretical base connected with the new and dynamically developed sector of 'AH' protection, wherein graduates can find employment.

During the projects development essential are both the originators of the project (and also performers) and participants which should be treated as co-authors (which will be further described). The authors have postulated that selected aspects of archaeology can be teach, without personal contact neither with trainees, nor with the so called 'field location'. Inviting computer scientists, authors elaborated five themes with varied quantities of modules. The teaching procedure relies on the participation in synchronous remote lectures, asynchronous seminars and a group and individual exercises. The work was activated by additional 'didactic elements': web links supplemented the range of the main subjects, and first of all the duty of participation in forums (minimum two opinions) and writing mutual essays (work in pairs and in groups). The same schema was introduced in all co-operatives in these project countries. In the conviction of the project originators, this international dimension, from the foundation serving to a multi-level exchange of participants experiences, demands the use and simultaneously tests the method of remote teaching. This innovative use within archaeology, and also up-to-datedness of the delivered essential contents, produces the question for the reception of the whole task among participants. In this manner participants become a side forming the project and the integral part to subjecting the projects evaluation.

The course evaluation – content

The evaluation takes place in two stages. First, includes the analysis of questionnaires within each partner-country. The second will refer to resumptions of the whole. Besides, an understanding of 'e-learning' participant's

Groups	Female		Male		Total	
	N	%	N	%	N	%
Graduate students	9	17.31	3	5.77	12	23.08
PhD students	1	1.92	3	5.77	4	7.69
Graduates	3	5.77	3	5.77	6	11.54
Conservators	13	25	8	15.38	21	40.38
Others	3	5.77	6	11.54	9	17.31
Total	29	55.77	23	44.23	52	100

Groups of profession	Initial number of participants	Number of resigning participants	Perc. of resigning participants
	N	N	%
Graduate students	12	3	25
PhD students	4	0	0
Graduates	6	1	16.66
Conservators	21	7	33.33
Others	9	3	33.33
Total	52	14	26.92

motives, a main aim of evaluation is an indicator on matters which can possibly help to improve this teaching method. Having this in mind, in this text we will focus exclusively on the results of received questionnaires from Polish participants of the course. First, we will introduce an analysis of the evaluation results of the method of the e-learning method, conducted using questionnaires.⁴ The use of a standardized questionnaire allows obtaining the general overview of the course, including a range of opinions and ideas regarding this teaching method. Besides that we will pay attention on rating participants concerning the manner of the courses' realization, then we will point out also potential reasons for their behavior. Consequently, we propose

Table 1 Gender of participants from different groups of professions

Table 2 Resigning participants in respective groups of profession

the interpretation⁵ of received results, remembering about its hypothetical character. At the present stage, it is too premature even if the partial confirmation, existing popular supposals that e-learning courses are 'a revolution in academic education', 'its true future', whether the challenge or even the threat' for the currently carried out manner of teaching.⁶

In Poland, 52 participation in the course which lasted 7 months was declared by 52 persons (Table 1).

A higher number of female (55.77%) than male (44.23%) took part in the course in Poland. As regards their profession, the highest number was represented by conservators (21 persons which constitutes 40.38%) followed by graduates students (12 persons – 23.07%) and graduates (6 persons – 11.54%).

The course was completed by 38 participants: conservators (the largest group with also a great number of resignations), graduate students, PhD students and graduates of archaeology.

Altogether, a total number of 38 persons completed the course, namely 73.08% of those who began it. Interestingly, the most work motivated group were PhD students, they finished the course in 100%. This is a very specific group. They are still not committed to professional work and often without family-commitments. However, conservators resigned in the greatest number. It is probably due to that many duties at work and at home. Remaining groups (Others) declared the boredom and the conviction that the course however would not be useful to them during their professional career.

Only 28 participants from the groups that completed the course answered the questionnaire. It was composed of 63 questions (open and closed), arranged according to blocks of essential content (what is learned?) and 'tools' of media (how is something learned?). The supplement was constituted by questions concerning three aspects of the course: technical (problems with the earlier conducted configuration and the navigation in the program); social and its relationship with the quality of teaching (lasting of made acquaintances, international range of the initiative), and appeal of the all undertakings (measured with an international context, with usefulness of knowledge and with competitiveness with relation to traditional, stationary means of knowledge transmission).⁷ For 96.4% learners, this e-learning course was the first of this type of experience.

Modules	% of indications
Theorizing cultural heritage	10.71
Mentalities and perspectives in archaeological heritage management	3.57
Concepts of understanding – spatial valorization of archaeological heritage resources	0
Aerial survey in archaeological protection and management system	50
Geographic Information System as a method of management of spatial data	39.28
Geophysical prospection in archaeological protection and management system	17.86
Images of the past	7.14
Cultural biography of landscape	25
International conventions and legal frameworks	28.57
Sustainable development in the archaeological heritage sector	17.86
Management cycle & information systems in the archaeological heritage sector	3.57
Commercial archaeology	7.14
A single voice? Archaeological heritage. information boards and the public dialogue	3.57
Methods of engagement. publicity and media relationships	21.43
Public outreach – museums. schools. services	0

Essentially, respondents rated favorably the very idea of the course (75 % answers) along with its modules (100 % answers). The most interesting modules were recognized (*Table 3*): *Aerial survey in archaeological protection and management system*, *Geographic Information System as a method of management of spatial data*, and *International conventions and legal frameworks*. According to graduates and graduate students these subjects will be helpful in their future work. They permit also to increase their knowledge (especially within the range of non-invasive methods) which were not learned during regular studies.

Table 3 Percentage of indications of the best module

Modules	% of indications
Theorizing cultural heritage	14.28
Mentalities and perspectives in archaeological heritage management	14.28
Concepts of understanding – spatial valorization of archaeological heritage resources	7.14
Aerial survey in archaeological protection and management system	17.86
Geographic Information System as a method of management of spatial data	7.14
Geophysical prospection in archaeological protection and management system	17.86
Images of the past	3.57
Cultural biography of landscape	7.14
International conventions and legal frameworks	7.14
Sustainable development in the archaeological heritage sector	17.86
Management cycle & information systems in the archaeological heritage sector	14.28
Commercial archaeology	14.28
A single voice? Archaeological heritage. information boards and the public dialogue	10.71
Methods of engagement. publicity and media relationships	10.71
Public outreach – museums. schools. services	7.14

The module *Aerial survey in archaeological protection and management system* appeared the most controversial, because for example for conservators it was 'of little interest' – the only one person from this group had a different opinion. Besides, the subjects of lectures extend interests, among other things through the interesting bibliography, including a look into many connected aspects regarding 'AŁ' protection, for example, through the recognition of modern technologies for documentation and reconnaissance. Particularly significant appeared the module concerning international legislation. Respondents recognized that Polish conventions contain numerous

Table 4 Percentage of indications of the worst module

gaps, making the work on 'AH' protection difficult and they declared the necessity to change in this regard. Opinions of students had a brief, but simultaneously most enthusiastic implication. This group finds that lectures show the development of the discipline and supplement in large measure the knowledge acquired during regular studies.

The modules which pleased the least (see Table 4) were *Geophysical prospection in archaeological protection and management system*, *Aerial survey in archaeological protection and management system*, *Sustainable development in the archaeological heritage sector* and also *Theorizing cultural heritage*, *Mentalities and perspectives in archaeological heritage management* and *Commercial archaeology*.

It is worth stressing in this place two matters. First, these estimations are more 'dispersed', which means that differences in indications on each module were very small: from one to two. Secondly, the critique had an ambivalent character, for example the language of lectures seemed to be too simple, even banal, but at a same time communicable and without the need from users of the platform to work with a dictionary. One ought to add that the variety of modules obtained a simultaneously similar score of the 17.86% positive and negative answers (for example *Geophysical prospection in archaeological protection and management system*). Furthermore, in the conservator's opinion courses were good, however, some of them brought in nothing new, or, as giving inspiration, raised the need for information. Sometimes they had theoretical (little practical) character and 'were wrote forcibly'. Both, this group, as well as graduates and graduate students claimed that because lectures constituted a logical block, it is very difficult to indicate the most unsuccessful of them. This polarization of opinion means that it is difficult to design a course which pleased in similar measure to all receivers, differing first of all with professional experience and so called practical experience. This thread will become fully described in the final part of the article with reference to the 'social-psychological portrait' of participants.

The essential evaluation criterion within the meritorious range, and simultaneously showing the whole of the courses structure, referred to necessary labor input to the assimilation of the content of lectures. A dominant opinion that most labor-consuming modules (see Table 5): *Geographic Information System as a method of management of spatial data*, *International conventions and legal frameworks*, *Geophysical prospection in archaeological*

Modules	% of indications
Theorizing cultural heritage	10.71
Mentalities and perspectives in archaeological heritage management	10.71
Concepts of understanding – spatial valorization of archaeological heritage resources	10.71
Aerial survey in archaeological protection and management system	10.71
Geographic Information System as a method of management of spatial data	46.43
Geophysical prospection in archaeological protection and management system	32.14
Images of the past	10.71
Cultural biography of landscape	25
International conventions and legal frameworks	15.71
Sustainable development in the archaeological heritage sector	3.57
Management cycle & information systems in the archaeological heritage sector	10.71
Commercial archaeology	3.57
A single voice? Archaeological heritage. information boards and the public dialogue	3.57
Methods of engagement. publicity and media relationships	14.28
Public outreach – museums. schools. services	25

protection and management system and *Methods of engagement, publicity and media relationships* proved simultaneously the most important in the trainees work, which explained their own engagement.

Besides graduates prevailing opinion was that particular modules involved a similar effort. Instead, conservators stated that lectures *Theorizing cultural heritage*, *Concepts of understanding – spatial valorization of archaeological heritage resources*, *Public outreach – museums, schools, services* delivered theoretical bases and that is why it is proper to get the feel of this subject

Table 5 Percentage of the most labor-consuming module

Modules	% of indications
Theorizing cultural heritage	46.43
Mentalities and perspectives in archaeological heritage management	21.43
Concepts of understanding – spatial valorization of archaeological heritage resources	21.43
Aerial survey in archaeological protection and management system	35.71
Geographic Information System as a method of management of spatial data	7.14
Geophysical prospection in archaeological protection and management system	14.28
Images of the past	14.28
Cultural biography of landscape	3.57
International conventions and legal frameworks	14.28
Sustainable development in the archaeological heritage sector	3.57
Management cycle & information systems in the archaeological heritage sector	0
Commercial archaeology	32.14
A single voice? Archaeological heritage. information boards and the public dialogue	17.86
Methods of engagement. publicity and media relationships	17.86
Public outreach – museums. schools. services	14.28

matter. However, this does not result that one sacrificed to them most of the work. Single opinions (33, 33%) in this group acknowledged the module *International conventions and legal frameworks* as useful, but without the need of great engagement, except for the penetrating reading of its content. In students opinion (80% of indications) this module demanded most effort. The least labor-consuming, especially among graduates, are modules *Theorizing cultural heritage* (92.86 % of indications), and *Commercial archaeology* (also in the conservators opinions), while the module *Aerial survey in archaeological protection and management system* obtained mostly 'diffuse' indications.

Table 6 Percentage of the least labor-consuming module

The course evaluation – methodology

The commitment of the course participants into the work over the content of lectures has a connection with the manner of knowledge transfer. At the construction of the survey, special attention was paid to the matter of the structure of each module, their mutual arrangement, the communicability (Were the contents and the language understandable for the participants?), and also the relation between the length of the duration of each module parts (the limited exposure time on the platform) and the understanding of the given material. In the conviction of the vast majority of participants the modules were introduced in the suitable order (96.43% of indications) and constructed in a logical manner (92.87% of indications). One perceived also satisfying level of the modules content and the good communicability of the proposed subjects (in both cases 96.43% of indications), and also the sufficient time of their duration (75% of indications). Furthermore, most of the participants (92.87% of indications) declared that e-learning media were well-chosen to the proposed subject matter, which simultaneously confirms the opinion about the well constructed structure of the course.

The authors of the survey assumed that the above mentioned features had an influence on the learning effectiveness, similarly as used methods ('didactic tools'), e.g.: the literature, syllabus, discussions on the forums and the writing of essays. The proposed bibliography was rated as 'useful' (60.71% of indications, including 64.28% of indications in the group of graduates), then as 'professional' (50% of indications), adequate to expectations and contents (35.71% of indications). In addition, more than half of the participants (69.86% of indications) used a syllabus, almost one-third (28.57% of indications) used it sporadically, and the vast majority (75% of indications) accepted the contents as useful. It is significant that these 'helps' did not have critical opinions.

The participation in discussion forums was translated into quantity of time devoted to them (there were problems with exact time estimation), their inspiring part in the interest with proposed subject matter and the influence on the quality of the education and on linking longer communications between people. The most committed to this were young graduates – daily they dedicated to this matter about one hour. As some say, they used forums unsystematically: '20 – 30 minutes daily, or when work was accumulated'. However, they very precisely estimated the time needed to study the modules in c. one hour. The duty of the participation in this didactic option was

softened by the possibility of the choice of the time of the day. Most of the participants had to combine their professional work with participation in the course. In this case, the most frequent time 'of meetings on forums' were evening-hours. The exchange of ideas and opinions did not have an influence on the persistence of contacts among participants. They showed a very pragmatic approach, ascertaining that acquaintances ended with the end of the course. They appreciated the inspiring function of this method of teaching (82.14% of indications) and the considerable influence on the elevation of the quality of the e-learning education (85.71 % of indications).

The following supporting method was connected to the necessity of the writing of essays 'in pairs'. Graduates were in this regard enthusiasts (57.14% of indications), because they recognized this experience as inspiring, while conservators – as individualists (88.89% of indications) showed large skepticism (dictated with presumably definite, 'former' learning habits). Generally, in the group 'individualists' predominated (71.43 % of indications), including, what is interesting, eight graduates (57.14% of indications). This group, as was shown earlier, treated work in pairs as a challenge; however, they prefer to work individually. The common work on essays demanded also a definite input of time – in accordance to requirements one should have to sacrifice slightly 6 hours on one course – which proceeded very much differently. The most precise in time estimation were students spending about two hours every week. Others dedicated to this task from one hour to four days. The unique exception is the period of two weeks.

The general rating regarding the effectiveness of the courses conducting methods indicates the slight superiority of the study of modules (53.57% of indications), in relation to the additional 'didactic tools' (43.86% of indications). The results concerning the time seem to support this statement. Participants most precisely estimated a duration of the work in particular modules (most of all indications regarded the option 'about one hour'). Simultaneously, opinions that the participation in the course had been characterized with irregularity have appeared: one time from 20 to 30 minutes, another time even 5 hours, or participants did not at all work systematically. This permits the supposition that irrespective of the effectiveness of a particular didactic method, exists other, unrelated with the course, factors that have an influence on it.

The success of teaching through the Internet determines the technical base, e.g. the efficiency of the information transfer, conditioned among other

things with familiarity with the program among participants, as well as with the quality of equipment used by them. Research did not embrace this variable because of the difficulty in reaching reliable information exclusively by asked questions. Instead, it succeeded to rate the technical side of the course understood as: (1) problems with hardware and programs configuration. The vast majority of learners avoided any problems with hardware (92.88% of indications) as well as with the platform (75% of indications). The technical support to the course was found satisfying (82.14% of indications). Besides, the technical side of the courses functioning was tied up with the proper operating of particular modules: the navigation in modules was rated as favorably (85.71% of indications). Furthermore, interactive elements were rated as positive. They were ready to use in the right place and time (96.43% of indications). The best module technically was recognized respectively *Aerial survey in archaeological protection and management system* (64.28% of indications), *Geographic Information System as a method of management of spatial data* (32.14% of indications) and *Images of the past* (17.86% of indications). The remaining parts of the course obtained approximate results. The most favorable ratings were formulated by graduates, while conservators evidenced 'good preparation' instead students 'had not provisions'. Respondents did not indicate the worst technical module, which allows to give the high rate to the technical aspect of the program (in the filtering question 89.28% of indications confirms this mark).

The course evaluation – prospects for the future

The social aspect of the course is characterized, as shown above, by the emergence of not only 'internet-circle of friends', but rather interest groups linked by particular knowledge, making them a circle of specialists. We can also include teachers who according to participants (92.88% of positive indications) took care of good communication with them. The quality was raised by the international character of the project which accordingly to the opinion of most participants (96.43 % of indications), affected well the level of the education. Participants argued that the knowledge delivered during the course allows the understanding of current problems connected with the 'AH' protection in the country and in Europe (75% of indications), and also that this knowledge will be useful in the future during their professional work (89.28% of indications). Such opinions were presented especially by conservators. The least determined in this regard were graduates.

To the discussed aspect of the course is connected the following aspect, 'the appeal'. The courses appeal is constituted by many elements. The international character of the project influenced almost half of the participants on the decision about the choice of the course (42,85% of indications) – this factor was especially important for women (57.89% of indications). It lasted a sufficient time (75% of indications), which in the opinion of most (75% of indications) made it possible to get to know all of the proposed content of the modules. The content of the modules was granted by the vast majority of trainees as useful (92.88% of indications) and of practical character (96.43% of indications).

The next aspect, also very important for the future of e-learning in our country, is the competitiveness of e-learning and its effectiveness with relation to the traditional transfer of knowledge. Participants pointed out the advantage of e-learning (67.86% of indications) over the traditional method (the lack of indications), however this is important to take into account the large number of indications (32.14%) with an undecided opinion: 'it is difficult to say, it depends on the subject of the module'. The groups most satisfied with e-learning solutions were conservators and graduates. However, as regards the effectiveness of e-learning results show hesitation amongst respondents – 71.42% of indications. The picture complements one more point, namely the perspectives of teaching archaeology via the internet. In this matter results show a positive prognoses – 96.42% of indications on the 'very well' and 'well' option, at the lack of indications on the option 'I do not see the possibility of using e-learning' and only 3.57 % of indications 'difficult to say'. Comparing with the competitiveness, the effectiveness and perspectives, the last result suggests that participants favorably perceive e-learning, but they did not break with the traditional methods of studying. For this kind of opinion speaks also the ambivalence of the attitude towards the idea of the meeting lecturers with participants after the end of the course: 46.42% of indications on the option 'yes' and 'rather yes', 32.14% of indications on the option 'not' and 'rather not', at 21.43% of indications on the option 'this is difficult to say'.

The remaining part of the course evaluation comprises a discussion on its virtues and failures as well as postulates to supplement the content of learning. In the first case, the participants appreciated the flexibility of this method regarding the time and the place of learning. According to them learning through the Internet permits to combine numerous professional

and everyday duties with additional training, which was accordingly claimed by all three groups of participants. Graduates noticed the possibility 'of saving time and money', appreciated the possibility of learning at home, the chance to improve their qualifications, which is an offer, which they can not find in their own city. Students were convinced by the international dimension of the project making possible an access to different opinions about 'AH' protection. At the same time, the course failures refer to the need of extending and consolidating knowledge. According to the participants the modules became too quickly blocked, and the printing of drafts and delivered contents of lectures was impossible. In every module it would be very useful if there was an electronic version of the bibliography and a greater number of publications in Polish (according to conservators). Participants pointed out also to the lack of personal contact with lecturers to whom they could not give questions during the course. In addition, conservators pointed out certain inconveniences in the necessity of self-discipline and the writing of essays with strangers in a group (alike students), while graduates pointed out the difficulty of motivation. One ought to underline that a small number of participants shared their own opinions on this issue and left this question open.

It is worth pointing out that some participants expected more detailed presentation of some issues. This referred in particular to a need of greater depth of knowledge regarding legal solutions in Poland within the range of 'AH' protection. It would also be of use to put more information connected with problems concerning 'AH' protection in other European countries (taking into consideration the sociopolitical and cultural situation). In addition, participants postulated the introduction of practical courses with specialists, and also certain changes in the course program: increase the number of modules concerning theory (57.14% of indications), the number of exercises (53.57% of indications), also in modules (60.71% of indications) and remote work (50% of indications). Participants rather do not see the need to increase the workload: individual work with modules (a slight difference between indications on 'yes' 42.85%, on 'rather yes' and 39.29% on 'no') and on forums (64.28% of indications). They want the course to contribute to the popularization of archaeology, including a complex nature of 'AH' protection.

Final remarks

The analysis presented above delivers fragmentary (with relation to all partner-countries) data regarding the opinions of Polish participants in the

course 'Archaeology in contemporary Europe'. They clearly indicate that e-learning is an interesting and useful method of teaching and the course, which though has weaknesses, was conducted with success. This opinion is testified by the positive mark regarding not only the course contents, but also its technical side. Simultaneously, as indicated by the survey results, the course did not satisfy all participants to a similar degree. We can suppose that this is due to belonging to social-cultural 'different worlds' affecting the reception of training contents. Unfortunately, the proposed evaluation does not allow for the examination of these factors and sketching a fuller portrait of e-learning students. This is caused by a number of factors. Firstly, a comparatively long questionnaire, which – for the participants comfort – did not contain the pool of questions regarding social and cultural aspects of respondents lives. Secondly, circumstances conditioned the education should be observed in the everyday practice of the given group, and then confronted with obtained declarations. Unfortunately, this kind of research was not possible. Nonetheless, it is proper to put here an important question, how does the cultural environment of the course participants, bears on the perception and the use of e-learning?

Information obtained from the survey allows to make only a very general 'psychological and social' portrait of the participants. They were characterized, on the one hand by the curiosity of the proposed subjects that the efficient realization challenged the wish of learning the key matters regarding 'AH' protection. The most pragmatic and inquiring in this regard was the attitude presented by the conservators. More experienced, with relation to students, in the professional experience, they better assimilated the contents connected to legislation and rated more critically particular modules. Simultaneously, they showed skepticism as regards methodical innovations, including the participation in forums and a group work. The graduates are similar to them. Interestingly, completely different are graduate students presenting the usually enthusiastic attitude with relation to the whole course. All groups seem to be bounded with the traditional manner of learning, and consequently this habit in the knowledge acquisition does not make easy an implementation of e-learning solutions. Furthermore, participants are characterized by openness on international relations and awareness that professional practice involves vocational training. The best aspect of this training method is its flexibility. Each participant can regulate the learning time, is able to develop familiarity with the computer, and also can socialize himself/herself

through the necessity of cooperation with other participants. Simultaneously, methods of teamwork were not enthusiastically evaluated by the course participants.

The analysis of the questionnaires allowed assessing the cognitive potential of the course. The correction of some solutions from the proposed didactic tools range can improve course performance, especially if their authors aim at efficient teaching of participants. This should be possible by providing much longer access to the modules after the course completion.

E-learning courses can be seen as yet another kind of social and cultural contacts. Their investigation generates a number of methodological and methodical problems, especially for anthropologists. Accordingly, interpretation of the survey results in terms of their implications for understanding contemporary social relations that go beyond everyday contacts and face to face relations makes it a highly difficult task.

Notes

- 1 The authors of this article are anthropologists. In the context of anthropology, many issues introduced in the text need a wider discussion, similarly as some conceptions related with the subject. However, it is proper to inform that the mentioned in the title e-learning method (literally meaning 'learning through the Internet') and education are important aspects, that on one hand create socially established manners of communication about the world, and on the other hand are the tools of its completion.
- 2 In opposition to 'not traditional' would 'the physical interaction: they respond mutually on their own behavior extra-verbal (they work more strongly) and verbal, in other words they experience sensually and intellectually their own presence. In this situation 'the work of the senses' is more intensive, than in the case of visual contact, how this takes place for example during lectures delivered by means of cameras (in this case they were not used during the project), or during the discussion on forums (the practical method used during the course).
- 3 Internet address of the platform: www.e-archaeology.org
- 4 Data received in this way are showed in the tables. Due to the space constraints, we presented only some of them. They contain general information regarding participants and accomplished by them the essential estimation of each module (most and least successful in respect of methodology), and also according to quantity of interest the necessary work needed to the assimilation of the projects content.

5 Through the interpretation we understand the synthetic discussion of findings, seeking certain constant 'features' characteristics for the discussed case, and possibly 'non-typical'. We do not invoke to any theories or ideas, for example, modern behaviors of people, living in the western culture, who participate in the so called information society, 'post-modern' or 'after-modern'.

6 A branch of cultural anthropology known as infonomics (Czekaj, Cwiklicki 2009: 4) aims to study e-society, including e-culture. Studies on e-society in Poland has hardly begun. In this regard, it is worth mentioning an volume *E-nauka, e-kultura, e-społeczeństwo* edited by B. Płonka-Syroka & M. Staszczak and published in 2008.

7 D. Silverman (2008: 55) argues that one has to carefully interpret statistically significant correlations between variables in the cause and effect terms. This is particularly in the case in this article due to a small number of data being studied.

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06

Democratic dialogues in cyberspace. Anders Gustafsson & Håkan Karlsson

Experiences from two distance learning courses in archaeology and cultural heritage at the Department of Historical Studies, University of Gothenburg

Introduction

In this overview we will carry out a brief comparison of two different distance learning courses that we have arranged at the Department of Historical Studies at the University of Gothenburg, Sweden. The first course to be presented below is the course *Archaeology – Introductory course* (given at the department on eight occasions since the Autumn of 2001). The second course is *Archaeological Heritage in Contemporary Europe* (given on one occasion during the Spring of 2009). Below we will present these courses from a number of themes and briefly discuss their pros and cons. As we will see below: these two courses differ from each other in a number of ways, for instance, they are different in length, focus and depth, and they differ when it comes to their pedagogical approaches. They do also differ concerning the demands of the previous knowledge required of the students that are accepted to follow them.

Despite these differences we mean that the comparison of these two courses, and the result of this comparison, can constitute a background to interesting and important discussions concerning the future of e-learning based education within the cultural heritage sector as well as to reflections concerning the e-learning concept's wider influences in society.

Archaeology – Introductory course

General background

The background to the course could be found in a pedagogical strive to find flexible solutions for people that by various reasons could not follow ordinary campus based education in archaeology. Thus, the course can also be seen as a democratic project. The course was developed as co-operation between the department in Gothenburg and the Learn-Centre of Falbygden (a state financed educational service available in the countryside) during 2000 – 2001. The personnel at the Learn-Centre handled all technicalities concerning the production of the course as well as the technical recourses for handling and running the course at the same time as the department in Gothenburg was responsible for the content of the course. The main characteristics of this course is that the lectures were filmed and that these films were combined with connected to, voice-text, as well as text-illustrations etc. At the same time the students interacted with each other and the teacher via the conference platform First Class. The first time the course was given was during the period of Autumn 2001 – Spring 2002 and since then, the course has been given on eight occasions.

Description and curriculum, aims and scope

The course is a distance learning course on 30 ECTS credits running at half speed, i.e. over one year instead of one semester. The course starts with an introductory weekend in Gothenburg where the course is presented. It also includes a full day excursion to the nearby island of Hisingen. In the middle of the course, in January, there is another meeting in Gothenburg, with museum visits and practical exercises to classify the archaeological material. The aim of the course is to give students a general orientation of the main outlines of world prehistory as well as brief knowledge of archaeological material (mostly Scandinavian), theory and methods. The course is directed towards students at the university.

The course is divided into four sub-courses: Autumn semester: (1) Introduction to archaeology (3 ECTS credits), (2) Cultural landscape and materiality-field course (6 ECTS), (3) Global archaeology (7 ECTS), (4) The pre-and early history of Northern Europe (8 ECTS), (5) Artifacts as an archaeological record (6 ECTS).

Pedagogy, methodology and learning techniques

The course is entirely based in PBL (Problem Based Learning) pedagogy and research based problems that the students have to solve in collaborative groups of 4 – 6 persons. The technical platform used is First Class, a commonly used conference platform in Sweden, which enables the students and teachers to meet in group conferences, to chat and create links. It is not, however, wiki technology. The lectures are filmed and are connected to, voice-text, as well as text-illustrations, etc. The lectures are presented on cd's, where the students can see the lecturer giving the lecture in a square-inch window. The lecture is linked both to illustrations (for instance, maps, artifacts etc.) that are presented in another window as well as to the subtitles of the lecture.

The point is that the students can go back and forth in the lecture via the headlines. The main advantage with the cd's is that the student can follow the lectures at any time and/or place and move back and forth in the lectures over and over again. The drawback is of course that the students cannot interact directly with the teacher. Another interesting observation is that the filmed lectures become much more concentrated than the ordinary 'live' ones. In some cases up to 50% shorter, and this is not solely depending on the lack of interactions with the students.

Assignments and feedback

For every sub-course there are 1 – 4 assignments. In all there are 12 items of coursework to finish during the year, 3 of them individually (2 evaluations and 1 reflection as a part of the introduction). Typically, a group answer on a single assignment will consist of 10 – 20 pages of written text (during the course the demands on the texts academic craftsmanship will increase). The bases of the assignments are generally broad research based problems without any demands on final solutions, and the students will have them all in their first day in class (in the study guidance). As seen, this is far from 'testing' the student's capabilities of memorizing text.

One assignment is, for example:

In this assignment the collaborative group shall present and discuss the most prominent theories around the transition from the Mesolithic to the Neolithic – from a hunter gatherer society to farming – and make your own reflections and commentaries. The question is a classic one in

archaeology – there is no final solution for you to detect. On the other hand, it is important that the work group really discusses the problem from their own point of view. Remember: Facts are sacral – but comments are free (nr 3).

Another example:

In this assignment the collaborative group shall discuss and reflect upon the burial traditions of the Scandinavian Bronze Age, with special attention to the regional, interregional and chronological differences. Other points to highlight are also the problems of the burial as a reflection of the surrounding society and as an indicator of interregional contacts (nr 8).

Within this context, the students receive constant feedback from each other (from individuals and groups) as well as from the teachers at the same time as they interacted, collaborated and co-produced the solutions to the research based problems that the groups had to discuss and solve.

The students

During the occasions that the course has been given both the number and origin of the students has varied. On a general level, however, some observations can be made. One of these is that: despite the fact that the course is a distance-course the majority of the students live in the Gothenburg area. Over the years a number of Swedes living in different parts of the world have followed the course. Concerning gender and age there is a slight overrepresentation of females and when it comes to age most of the students are in the age-span of 22 – 30, a slightly higher average age than at the campus-based course which is on the same level. Concerning the students previous knowledge all of the students have high-school education (Swedish Secondary School Education) and due to their age most of them have also experiences from work in different areas of society.

Evaluations – questions and student responses

In Gothenburg we have, so far, only worked with qualitative evaluations in the form of short essays from students. No questionnaires have been used. In fact these evaluations are a part of the curriculum of the course (obligatory assignment 6 and 12, which makes their answers good from a representative

point of view). The evaluations from the students is structured in a very free way, broadly aiming at their general expectations, comments on the literature, and, of course, how they feel how the technical solutions have functioned. In general, the students wrote ca 1 – 2 pages on each evaluation. Some ‘big pictures’ can be drawn, for example:

- > Many students express scepticism at first when they realize that they will work in collaborative groups and, not at least, for the technical solutions. But it is also very striking that these worries seems to vanish after 1 – 2 months (at least for most of the students). Many of them seem to have bad experiences from their high-school years, especially when it comes to working in collaborative groups.
- > The initial scepticism is also very often focused on the more general, reflexive character of the assignments. ‘How can we have opinions on these complicated matters when we have just started to learn about them?’ is quite a common comment. But also these doubts usually disappear during the course, but not as fast as the ones stated above. This is a crucial point, and as a teacher one has to spend a lot of effort to explain and argue for the pedagogical advantages of the chosen approach. One conclusion to be drawn from this is that the next time the course is given; one should put in a reflexive moment, focusing on different learning techniques.
- > The single most apparent positive judgment in the evaluations is the statements of the portable digital media used: the cd’s with lectures is generally a real hit. In fact, some of the students prefer these kinds of lectures instead of conventional ones! One remark: ‘The lecturers on the screen (maybe a square inch, *our comment*) seemed to be more alive than the ones I have encountered in my ordinary classroom (a science student). The reasons for the positive experiences of portable media hasn’t been analyzed in depth yet, but in some statements from the students they point at the positive aspects of the ability to freely navigate the materials, go back and forth, stop the lecture for a moment etc, as well as the advantages of that you can watch it anywhere. Hence, learning at ones own pace, own conditions and possibilities is in focus. Learning is never linear, so why should a lecture be? Another aspect of this is that you can escape what maybe called ‘the risks of cognitive overloads’ i.e. that many

students – especially from milieus with lacking experience of higher education – in an ordinary classroom tend to lose focus on learning. Fellow students, the teacher's behaviour, and the milieu in general etc. can in this sense be quite disturbing.

Evaluations – the teacher's view

- > The students seems to present more sophisticated results compared with the results from the students in more traditional classrooms; they show an enhanced range of expression and critical understanding. This is the direct result of working in groups in order to solve problems.
- > Students are more eager to work in an interdisciplinary way, to collect and examine critically information from other subjects and sources. It seems as if they develop much faster into critically minded individuals capable of better self-expression than students involved in more traditional learning environments.
- > And, quite surprising, it seems as if the students have more social contacts with fellow students and their teacher/s; they feel obligated to fulfil particular roles within their workgroups.
- > A number of students who have difficulties with or in traditional learning environments (due to e.g. geographical distance, disabilities etc.) have performed in these experimental courses in a very positive way.

Archaeological heritage in contemporary Europe

General background

The background of the course was the development of a distance-course within the framework of the Leonardo da Vinci II project, *E-learning as a tool of knowledge transfer in the field of protection and management of archaeological heritage*. This project was a co-operation between numbers of archaeological academic departments throughout Europe during 2008 – 2009 (see introduction in this volume). The departments involved produced the content of the course in co-operation; the department in Poznan, Poland handled the technical dimensions of the course, while the other partners involved did run the course at various occasions during the Autumn of 2008 and Spring of 2009. The main characteristic of this course is that it consists of a number

of modules (15) based on interactive texts and illustrations. The first time the course was given was during the period of Spring 2009.

Description and curriculum, aims and scope

The course is a distance learning course on 7,5 ECTS credits running at the University of Gothenburg at half speed during the period of 25th March 2009 until 8th May 2009. Since the course starts out with an introductory evening it can be characterized as blended learning. The distance learning training Archaeological heritage in contemporary Europe is aimed at delivering a coherent body of knowledge to a group of trainees of the most vital aspects of European solutions in archaeological protection and management, means of their implementation into their own practice as well as knowledge of European regulations and legal solutions in the field of protection and management of archaeological heritage.

The training is directed to professionals in the sector of archaeological heritage protection and management as well as graduate and extramural students interested in this field of expertise. The training process is composed of lectures and practices in accordance with the schedule below.

Part 1 Theory of archaeological heritage

- 1 Theorizing cultural heritage
 - 2 Mentalities and perspectives in archaeological heritage management
- Discussion Forum 1: What is heritage?*

Part 2 Mapping of archaeological heritage resources

- 3 Concepts of understanding – spatial valorization of archaeological heritage resources
- 4 Geographic Information System as a method of management of spatial data
- 5 Aerial survey in archaeological protection and management systems
- 6 Geophysical prospection in archaeological protection and management systems

Essay (collaborative): Mapping of archaeological resources in a specific area.

Part 3 Valorization of archaeological heritage

- 7 Images of the past
- 8 Cultural biography of landscape

Discussion Forum 2: Archaeological heritage – fact or construction?

Part 4 Protection and management of archaeological heritage

- 9 International conventions and legal frameworks
 - 10 Sustainable development in the archaeological heritage sector
 - 11 Management cycle and information systems in the archaeological heritage sector
 - 12 Commercial archaeology
- Essay (individual): How would you change / apply (inter)national legislation and policy to meet the requirements of local heritage?*

Part 5 Politicizing archaeological heritage

- 13 A single voice? Archaeological heritage, information boards and the public dialogue
 - 14 Methods of engagement, publicity and media relationships
 - 15 Public outreach – museums, schools, services
- Discussion Forum 3: Presenting the past and setting the agenda*

Pedagogy, methodology and learning techniques

The course is conducted in an assisted distance training pedagogical mode. This means that all of the training materials are provided online and the training process is supervised by a teacher. The student works alone with the modules (15) based on interactive texts and illustrations. This at the same time as the students interact with each other and the teacher via the platform Edumatic. This platform enables the students and teachers to meet in different discussion forums set up before the start of the course, so they can chat and create links.

The point is that the students can go back and forth in the modules. The main advantage with the modules and their interactive mode is that the students are forced to slow down their reading which creates opportunities for reflection and contemplation. They do also have the possibility to go through the module on many occasions which strengthens their possibilities for critical reflections. This at the same time as the Edumatic tool contains functions that provide the teacher with the opportunity to follow the students progress (how much of the modules that they have gone through and how much time they have used on their work).

Concerning the learning techniques the course was carried out by the authors who also arranged the introductory evening. Our primary task was of course to create questions in the different discussion forums, comment

upon the student's contributions in the forums, and to read and access the student's individual essays that the students wrote in part 4 – *Protection and management of archaeological heritage*. Besides these obvious tasks we encouraged the students in different ways via emails and messages in Edumatic.

Assignments and feedback

A short example of a discussion in forum 1 – What is heritage?

The fifteen modules of the course are divided into five major themes. Every theme was followed by an assignment: three forum discussions, one collaborative essay, and one individual essay. Below we will present a brief example of what the parts of the discussion in forum one *What is heritage?* looked like.

Our starting point in the discussions forum was:

We will start with some basic points of departure: What is cultural heritage? How can we look upon the different chronological values of cultural heritage? Is there any? Is there cultural heritage that is best to forget? Where is the border between immaterial and material cultural heritage? Is there any? Many questions, no obviously given answers. Your task will be to discuss and/or reflect upon these questions in the forum. To pass the moment you have to have at least two entries per person and one of them must address the questions above; the other(s) can comment upon the other participant(s) contributions in the forum. The discussion must be finished by 24.00 hrs, on the 6th April. We will continuously visit the forum and make comments on the held discussions.

Good Luck! Anders G/Håkan K.

Student 3:

In a way you have to remember what you are about to forget... Cultural heritage is in fact in many ways a strategic place for different kinds of memory processes. Cultural heritage is created in a process where people and society as a whole materializes memories through different kinds of metaphors. At the same time one cannot deny the fact that collective memory shaping in many ways is a deeply political question. What is to be remembered and respectively forgotten?, is a very important question about power in society. Another important question here will be how different states around the world give priority to culture and culture

heritage in themselves, and therefore, this often turns out to be a question about economy...

Student 4:

I want to agree with an earlier statement in the forum that cultural heritage must be seen as an ongoing and never ending process. I mean that cultural heritage is not necessarily a must, but must be associated with different kinds of memories, just look at famous archaeological sites/ places as rock carving sites, the Kivikscairn and other prehistoric sites that I mean are cultural heritage – here there are no memories, just research and speculations. Moreover, one can ask oneself: Can we base our cultural heritage on something that isn't based on scientific facts?

Student 5:

The cultural heritage sector in Sweden today seems to automatically value older heritage higher than heritage from historical/modern times. At least this is the impression I've got when talking to people in the heritage sector, archaeologists and students of archaeology. It is also obvious, when reading the Swedish Heritage Conservation Act (The act protects place names, ancient remains, archaeological finds, historic buildings, ecclesiastical monuments and the export of specified older artifacts, authors comment). At the moment, I am working with an archaeological survey in an area planned for a wind turbine park. In the area we have found everything from Stone Age sites to many traces from crofter's holdings from the eighteenth century. For me it is obvious that the crofter's holdings are the most prominent cultural heritage in the area, in many ways cultural heritage that defines the area. I've spoken to many people in the neighbourhood that are worried that 'their' crofter's holding milieus will be destroyed, but I have not met one single person that expressed any concern when it comes to the Stone Age sites. But from the official cultural heritage management the Stone Age sites are pointed out as the most important for further investigations, while traces from more historical activities are reduced in value.

One feedback (of 6) from the teachers looked as follows:

Hello! A very good discussion! When discussing the relationship between material cultural heritage and intangible cultural heritage it is important

to remember that they are not fully separable categories. Different kinds of materiality are containers of an endless amount of stories of various kinds, and in many cases the materiality themselves are carriers of stories. In some cases, for example, the demolishing of old industrial structures has led to stories that existed around the industries to disappear in a very short period. The materiality reminds us. Another question has been how to preserve immaterial/intangible cultural heritage. In different forms this naturally happens all the time (all spoken statements, pictures and written sources that are stored in different ways). But a vast majority of immaterial cultural heritage will never find its way into museums and/or databases. But is that a problem? Have we not too long been captured in a seven-teenth century discourse where the world continuously must be classified and preserved in pieces? Isn't it enough that we have a respectful attitude towards different statements in a wide sense (cultural heritage) in our contemporary society? And that we try to preserve the cultural heritage that we (or others) find important for more specific use? Isn't in fact everyone's right to tell stories that it's the most important thing...? Good work! Anders G/Håkan K.

The students

So far, the course has solely been arranged on one occasion – the Spring Semester of 2009 – and on this occasion 6 students followed, and finished the course. Despite this meagre statistical material some general observations can be made. Also, in this course the majority of the students were living in the Gothenburg area, and were unfortunately from a gender perspective – all male. When it comes to age the students were in the age-span of 24 – 66. Concerning the students previous knowledge, all of the students had high-school education (Swedish Secondary School Education) as well as an Introductory course on 30 ECTS credits either in archaeology, ancient history or history. Since the course was directed to professionals in the sector of archaeological heritage protection and management, as well as graduate and extramural students interested in this field of expertise, the course attracted both of these categories.

Evaluations – student responses

In Gothenburg we worked with a qualitative and quantitative evaluation in the form of a questionnaire consisting of 61 questions. This was the same

questionnaire used by the other institutions giving the course (the general conclusions from the questionnaires are discussed by Šne and Marciniak & Chwieduk in this volume). The questions range from personal information of the student to questions concerning how and why they wanted to follow the course, as well as to various judgments of the qualities of different modules.

- > On a general level it can be concluded that all the students pointed out the course as very valuable in their own education as well as an important contribution to every archaeologist's life-long learning. This point is all the more interesting in those cases where the student already works as a professional archaeologist in the cultural heritage management sector. All students emphasized that the knowledge acquired in the course will be important in their professional careers in the cultural heritage management sector.
- > All students pointed out that the forum discussions were very valuable and important for their critical reflections of the themes discussed in the modules. A number of students also stressed that the possibility to test their arguments towards the teachers in these discussions was a clear strength of the course.
- > The students were positive to how the interactive material in the modules, as well as the modules themselves, functioned on the pedagogical level. This is also shown in the fact that a majority of the students pointed out e-learning as the best way to read and follow this course as well as archaeological teaching in general.
- > They also stress that the international character of the course was an important factor when valuing the qualities of the course. Not at least since the course did improve their knowledge and their awareness of heritage management and its different traditions and legal framework in different parts of Europe.

Evaluations – the teacher's view

- > As teachers we would like to stress that the work in Edumatic and the course's themes and interactive modules was easily to handle and it had great pedagogical advantages. The interactive moments in the text and

the illustrations in the modules obviously forces the student to slow down their reading and therefore gives them time for reflection and contemplation.

- > From the discussions in the forums it is obvious that the students present more reflexive results and thoughts in comparison with the results from students in campus education. The discussion forums function as a kind of working groups where the students as well as the teachers interact in a very productive manner. The forums are also interesting communicative arenas since they seem to hold a middle level between oral discussions and written statements (as for example in an essay).
- > The fact that the course and its content was created as co-operation together with colleagues of departments in different parts of Europe, representing different cultural heritage management traditions, was important. This was because from a pedagogical point of view the different traditions is a very good illustration of the socio-political, and contextual dependence of the meaning and content of cultural heritage

Concluding remarks

Above we have briefly presented two archaeological distance-learning courses. In many ways these two courses are very different in their character when it comes to their length, focus and depth, as well as their pedagogical approaches. However, despite these differences it can be concluded that a scientific discipline like archaeology that: contains a broad spectra of discussions (from philosophical to natural scientifically ones), is dependent on illustrations and maps, is anchored in a highly international research community and is very well suited for the construction, and use of e-learning courses.

In archaeology the e-learning concept can be of importance also outside scientific, and university based teaching and training, since at least in Sweden, Swedish people have a profound interest in prehistory and in the archaeological discipline. This means that archaeological e-learning courses can be used as an asset that can strengthen democratic development in society if ordinary citizens can take an active part in discussions of the past and their cultural heritage via e-learning courses and their discussion forums.

Hopefully, the future will lead to even more developed democratic dialogues in cyberspace.

07

Review on e-archaeology, the e-learning application on archaeological heritage management in contemporary Europe

Monique H. van den Dries

Introduction

One of the target groups for the e-learning application 'Archaeological heritage in contemporary Europe' is defined as 'professionals employed in local branches of heritage sector in participating countries'. As a participant of this group, I had the opportunity to take part in a test of the application which is the result of a project in the life-long learning programme that is co-funded by the European Commission (Leonardo II). The project was carried out by a team of lecturers from six European countries (see www.e-archaeology.org).

The test consisted of going through the entire course, within the time frame that will be applied when the course is taken in real life. It was a very enjoyable experience that not only gave me new insights and information on various heritage management issues, but it yielded some thoughts on additions too. As it turned out to be a valuable tool, I would like to share this experience through this review, in which the application's content, educational functionality, appearance and value will be discussed.

Test objectives

The test implied that from the beginning of February until June 2009 fifteen lessons (modules) would be taken at the e-archaeology website (www.e-archaeology.org). This was preceded by a short introductory meeting for the Dutch testing group that was organised by the Dutch participants in the project, lecturers from the Amsterdam Archaeological Centre (AAC) of the University of Amsterdam. The Dutch testing group consisted of four students, which represented the first target group of the application, and seven people

from the second target group, that of the professionals. During this introduction information was given on technical and procedural aspects, like log-in names, passwords, course duration, accessibility of the modules, etc. Apart from that there has been no contact with the developers of the application.

My prime intention was to experience the course as a post-graduate retraining module and to see whether the training objectives of the project team were met. Secondly, I wanted to compare the learning objectives for the main target group, master students on heritage management, with the ones we have developed for a master programme on archaeological heritage management at Leiden University. Thirdly, I was interested to see how the application would serve the two target groups. As they start off with a different knowledge and experience levels, they may have different instruction needs. But most of all curiosity was my motivation to take the course. As a developer of an electronic learning instrument in the nineties, I very much liked to experience the results of the developments in e-learning and to get an impression of its values today.¹

Working through the module

As the teachers added a new module to the website nearly every week, it was rather challenging to keep up with their pace. To keep up was very important, because each lesson would be accessible for a few weeks only. Presumably, this timetable was imposed to make sure that everybody would reach the same point at a particular moment in order to enable collaborative work (see below). However, this way of working caused some pressure that may not suit my target group very well. It does not go very well together with one of the most attractive elements of e-learning: flexibility. It may even enlarge the risk of learners to give up once they have missed out on one or more of the modules.

Participants from the target group of students may experience this pressure very differently. Perhaps they appreciate this structured way of working very much. But it is known from evaluation studies of e-learning courses that students point out workload as the main reason to withdraw, especially as 40 percent of the students spends more time than is allotted by the teachers (Laurillard 2001: 5). Nonetheless, it does help to keep going and I must admit that it surely encouraged me to finish the lessons in time.

The course is structured in five themes. These are also physically divided into five parts that one can enter separately on the website. The first part

handles the theoretical aspects of archaeological heritage: definitions, concepts and the approaches to archaeological heritage by different stakeholder groups. Furthermore, it is discussed how heritage management relates to the theoretical developments within the discipline of archaeology and how these influence management approaches. This is composed of two modules. The course gets practical in part two, by zooming in on methods and instruments to map archaeological heritage resources, like valorisations, geographic information systems, aerial surveys, geophysical prospection methods. In part three the valorisation of the archaeological heritage is highlighted, including the biography of the landscape as an example of invented images of the past. Protection and management issues are the subject of part four. It provides information on international conventions and the national legal frameworks, on sustainable development and on management cycles. Also in this context commercial archaeology is discussed. Finally, part five looks into politicising archaeological heritage. In three lessons it highlights public archaeology and communication with the public, methods of engagement, publicity and media relationships, and public outreach by museums, schools and other services.

Each module consists of the information and instruction on a particular subject, followed by exercises. These exercises consist for instance of statements which must be recognised as being correct or false or of characteristics that must be linked to the right time period or development. The way the exercises are presented is very user friendly with tick boxes and pictures or textboxes that can be dragged from one place to another. Moreover, one is allowed to check one's answers and to repeat the exercise as often as one likes. This is a very nice aspect of the application.

On average, each of these modules kept me occupied for nearly one hour, that is if I was lucky not to be disturbed. One (on aerial survey) took more than ninety minutes, another just twenty minutes. As it was not immediately clear how the course was structured (because I did not read the instructions carefully in advance), I missed the second module of the first part. The first screen of the course shows the entrances to the five main parts, but the underlying modules are not yet visible at that point. After finishing part one I waited for part two to be added. It was only when module two of part two was added that I understood the system and that I realised that I may have missed something in the beginning. By then the module was already closed for entry. Probably any new 'real' student will prepare himself better than

I did, and will read the instructions carefully, but it may be something for the teachers to keep an eye on during the actual trainings.

Altogether I have spent nearly 12 hours on the course.² This may seem rather long if you must find the time in between other activities during working hours. But actually it is not very long if you compare it with an ordinary academic course, in which each meeting usually takes two hours plus some time to travel back and forth. Fortunately e-learning enables you to choose a moment that suits you best or even to stop during a session, go shopping and finish it later. This is a huge advantage, for both target groups, as it allows you to take the course in calm hours.

How this result relates to the amount of time my target group is expected to spend and whether I was slow, average or swift in comparison with the other test participants of both target groups, can be found in chapters by Šne and Marciniak & Chwieduk in this volume. The application can record the time that one spends on each module, one's progress and achievements in the exercises. This is very useful for the teacher who wants to monitor the process. It may also give an indication of the efficiency of the modules and the application as a whole.

In addition to the modules and associated exercises, communication facilities are offered to add some interactivity. One could join more interactive activities in which one would communicate directly with the teachers and fellow students. These facilities consist of a public forum, a chat room and a consultation panel. A public forum was started after part one, three and five on the associated subjects. The participants could react to a proposition or a point of view of one of the teachers. Moreover, part two and four were followed by an assignment to write an (collaborative) essay.

Unfortunately, I cannot comment on these two interactive elements, because I did not participate actively. I even dodged from the duty to write the second essay. But I can contribute my observations on their degree of use. As the managerial facilities allow you to see the use statistics, I noticed that the communication facilities were not yet very intensively employed by the Dutch learners. The first forum discussion had a few contributions, but the other two had none. Curiously however, the first two did score a lot of views. This could be an indication that the community of learners suffered from some initial hesitation and were only looking instead of contributing. So did I, allowing myself the excuse of having to write this review to just look rather than to participate actively. On a few occasions I visited a chat room

too, but since no specific time was set for chatting, I did not find anybody else in there. Like all others, I did not explore the opportunities of the consultation panel either.

Due to this rather passive behaviour, I experienced that it is rather easy to miss out on these interactive elements of the course. The learner is expected to be attentive and actively looking for things that have been added, and is not prompted – either personally by means of an e-mail or publicly by a message on a bulletin board. But if one is not alert all the time, it may not be noticed that something is expected from you. This not only happened to me but to several other members of the testing group: we all missed the assignment to write the first essay. Probably this was due to the experimental circumstances that we were not reminded by the teachers. I presume that this will happen in real training life.

Although they were not yet heavily exploited during this test, these interactive elements and managerial tools surely enhance the value of e-learning for both students and teachers. The monitoring and interaction facilities enable teachers to notice backlogs or other problems immediately and at any moment during the entire course. As such, the application can be categorized as a rich virtual learning environment (VLE).³

Content

With respect to the content of the modules, the trainers did a great job. Right from the beginning the lessons were interesting and also very worthwhile for someone who is already fairly acquainted with most of the subjects.⁴ This has to do with the way the topics are presented. It is made clear that one can look at all topics from various perspectives and it is explained that the way one perceives the various aspects of heritage management is influenced by one's interest, background, social and political context, etc. To emphasize this is not only relevant for practitioners in the field of heritage management, but for students as well. The application allows them to get acquainted with the different aspects of managing archaeological resources, the aims, the legal frameworks, the processes and instruments, but also the various approaches and stakeholders and the dilemmas which this brings along.

The scope of the course is fine as well. There are no obvious issues or aspects missing, for attention is given to the main topics and to recent developments, discussions and dilemmas. An absolute advantage of the fact that it was produced by participants from several countries is that experts

from all kinds of fields are involved. They bring in various perspectives, point out multiple points of view and provide examples from different countries. This does not mean that there is nothing left to wish for if there would be an opportunity to develop a second version of the course. One possible addition concerns the geographic scope. For clear reasons the course is primarily directed towards issues in European heritage management, although relevant developments in the United States are of course mentioned as well. It would be useful however to include issues from other parts of the world too. For instance the module on legislation and international treaties shows which treaty was signed by which countries and when. This is now restricted to the countries that cooperated in the project of making this e-learning application, but it would be useful to provide a broader view and to include the information given by various organisations that keep a register of signatories, like the Council of Europe.⁵

There are also more fundamental issues that the course could be extended with, such as dealing with indigenous communities, illicit trade, repatriation, heritage management in conflict areas etc. Although they do not play such an important role in the archaeology of North-West Europe as in other continents, it would be useful to introduce these issues to students as well.

Finally, there is a matter of scales. Obviously an international focus is obviously very useful: the user gets to know heritage management aspects that may not (or not yet) occur in local situations or may not be prominent issues in the national archaeological discipline and they can learn a lot from developments, difficulties and solutions from elsewhere. But this could be balanced a little bit more with information on national issues as well. This would not only serve the students from a particular country, but the international community of learners as well. The challenges that for example Polish or Latvian archaeologists face are not just of interest to local students. Both the local state of art and the various approaches to common challenges in heritage management can be interesting for everybody.

Inevitable, choices must be made with respect to the issues included in order to keep the workload acceptable. All learners will realise that. For more experienced practitioners it may also be clear what topics have been left out, but for students this probably is less obvious. From an educational point of view it may therefore be valuable to give some information on the meta level by explaining why the choices are made, what other aspects are relevant as well and where one can find more information on these subjects.

Educational aspects

In an introductory document that is part of the e-archaeology website, the project team has defined their training objectives. As was said above, they expect to serve two target groups with this course, students and professionals. Although the team does not make an explicit distinction between the two groups in a sense that they formulated specific training objectives and a different approach for each group, the two groups are expected to profit differently from the training. According to the introductory document, the professionals are expected to efficiently implement the information that is provided in their own practice, whereas students are meant to enrich their qualifications for the job market with the help of this course.

More concretely, the learning objectives are directed towards acquiring knowledge on the topics that the application covers, but also towards developing skills. For instance, after the course the learners should be able to recognize numerous stakeholder groups and to identify their needs and expectations, to approach an archaeological heritage issue with better understanding of its numerous facets and to understand the significance of valorisation of archaeological sources. These objectives are surely met, as these are precisely the issues that are comprehensively covered: the course provides a lot of information on these topics. Moreover, it gives insight in the scope of the domain, its issues, dilemma's, discussions and prevailing opinions. In addition, the learner can get an understanding of the development of heritage management in an international perspective.

With respect to the development of skills, the introductory document states that learners are expected to 'know how to deal with challenges posted by commercial archaeology', to 'efficiently deal with the general public' and to 'deal with the media'. It is absolutely laudable that attention is given to these issues and that it is acknowledged that it is important for archaeologists to develop skills on these matters. I am not really convinced however, that these objectives are met by the course. Undoubtedly, it helps you to get to know about the challenges, about the principles of dealing with the public and the media, but in order to be able to actually apply this knowledge effectively, you have to practice it and to experience it in the real world. The application however does not provide a practical environment in which these skills can be practiced. Only if a work placement or another variety of an internship is offered, a practical experience can be offered. But since this is extremely difficult to implement, this can hardly be seen as fundamental critique.

In comparison with the learning objectives that we formulated for master students on heritage management at the University of Leiden,⁶ there are mainly similarities. The issues we want the Leiden students to gain knowledge of are comparable, although some differ. We pay less attention to issues like geographic information systems, aerial survey and geophysical prospection at this level. This is something they learn in bachelor courses.

With regard to competence building, we would like students to develop their ability to analyse and discuss literature and to present their own informed opinion. This is being achieved through student presentations and discussions in the class room. The e-learning application pays attention to this as well by offering forum discussions and by the assignment to write an essay. However, an important aspect of having live discussions in a group is that one can learn a lot from interaction with each other. This can only partly be realised by organising a (obligatory) forum or a chat room or by writing an essay. Perhaps a video-conferencing session could be offered to simulate a live class room. In advance of the course one could set a few dates at which a conference will be held and for which everybody will be invited to prepare oneself with specific lessons or literature.

Whether and to what degree the lessons have contributed in the end to the development of the learners is difficult to say. Through the questionnaire (see chapter by Šne and Marciniak & Chwieduk) the test participants indicated that they were satisfied with the content and the skills they had learned. But apparently, it is generally hard to demonstrate that e-learning has particular good effects on students. This was found in various studies (e.g. Burrige and Ötzel 2008). In addition to a questionnaire it would therefore certainly be interesting to perform a test with students to assess their gain of knowledge, as one would do with a face-to-face training.

Learner needs

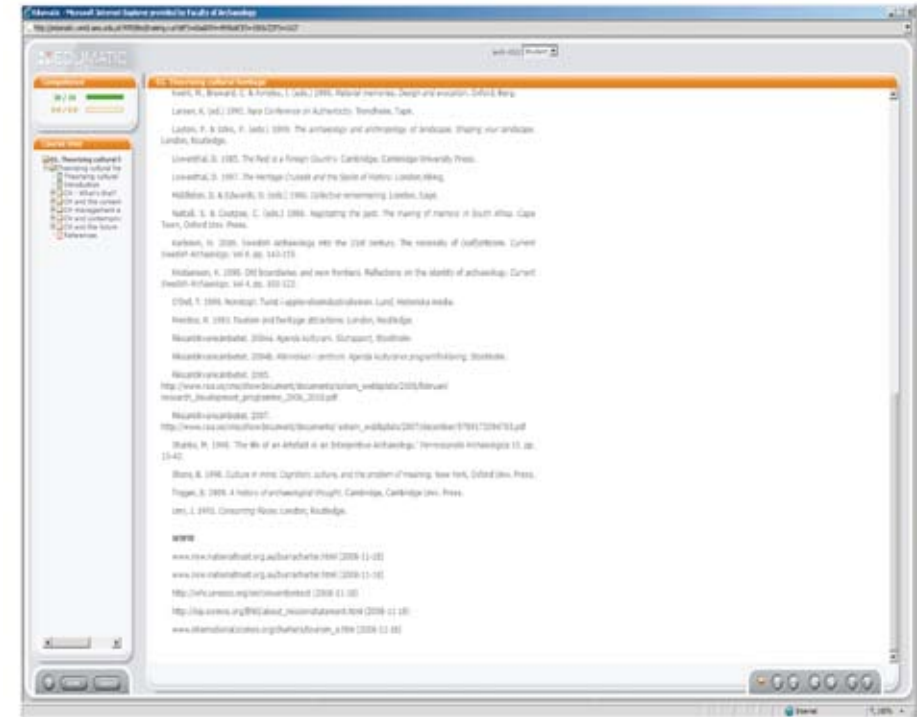
Whether the training objectives of the trainers are met is only one part of the story. It is just as interesting to evaluate whether the learner's needs have been satisfied as well. For me it is difficult to say anything on behalf of the students, as I am not a member of that target group. Articles of Šne and Marciniak & Chwieduk presented in this volume on the results of the questionnaire gives a good impression however. The students reported that they were predominantly satisfied with most aspects of the course. I would not be surprised that – when asked – they would indicate that they missed the

interaction with fellow students. Young learners seem to ‘show a preference for socializing with peers, participating in group activities and working in groups’ (Siozos & Palaigeorgiou 2008, 7). Several of the students did express a preference for a traditional course. As a representative of an older generation, I would certainly miss the contact with the students. That is probably also the reason why often blended models of teaching are applied, in which e-learning is combined with face-to-face teaching.

Here again, differences surface between the two target groups. I am inclined to say that, in comparison with the students, it is slightly more difficult to meet the needs of the target group of the professionals. Undoubtedly, the content of the course is interesting and very useful for professionals as well. They get information on contemporary best practices in dealing with various management dilemmas which can be rightly incorporated in their work. But heritage management practitioners may want to gather information and knowledge in a different way than students. As most of them may want to broaden or deepen their knowledge on particular issues, they already know more precisely what they want to know. This will make them more selective. Yet, a lot of knowledge and information in the present course may be known already. There is nothing wrong with refreshing your knowledge, on the contrary, but it is not the most efficient way if you want to broaden or deepen your knowledge.

Therefore, it would be worthwhile to think of a more individual approach in which the material is adapted to the learning needs. One might think of dividing the modules into different levels of knowledge which the learner is assigned to on the basis of a preceding determination of the learning needs. Another option is that you can make a selection of lessons and themes that you are interested in most or know of least.

Most of the other needs that I had as a learner were rather practical. In this respect the particular aim of the teachers that learners are expected to efficiently implement the knowledge in their daily practice, my expectations were not completely met. It would for instance be helpful not just to give good (and bad!) examples but also to add documents that can be employed right away, like for instance a good example of a management plan or other best practices. It would be efficient too to either include references or to have a direct link to the sources and literature that are mentioned in the modules, or to the place where you can obtain it. In the present application the references are not linked to sources (see Figure 1), while one more or less expects



from an on-line training environment to get rather easy access to the digital sources. Especially for people who are at a large distance from physical sources, like a book shop or a library, it would be a great service to get direct access to on line sources, such as the growing number of journals that is available through the Open Access. In its turn a structural demand for educational purposes may even help to stimulate on line publishing (see Carver 2007).

Furthermore, it would be useful if it would offer facilities to enlarge your business network, for instance if you could get in touch with (some of) the experts who are mentioned in the course, to ask them a question, feedback, additional information, etc. In general the networking facilities could be extended as a whole, for instance by adding web pages or e-mail addresses of experts on a particular field or heritage site or of projects you might be interested in to participate.

Figure 1 Links to sources would contribute to the efficient use of the information that the application offers.

Another practical need that I had was to be able to print some parts and to read it on paper rather than on screen. This does not seem to be an exceptional need. Even students of a generation that is used to working on the screen seem to have it, as was shown by an evaluation of an electronic IT-programming course that was carried out by the Open University of the United Kingdom (Laurillard 2001, 5). They witnessed that their students printed out a high proportion (up to 54%) of the online material. The archaeological heritage project does not provide this facility yet. Nor is it possible at the moment to save a text, illustration, exercise or reference list other than by copy-paste. And some texts are included in boxes that cannot be reproduced by copy-paste but only by capturing a page through a screen dump. A printing facility therefore is something to wish for in a future version. It would already be very convenient if only a summary of each module could be saved or printed.

The fact that the individual modules were locked after some time was not very practical either. This made it impossible to go back to former lessons and to re-read particular parts or references, while in fact this is stimulated by the teachers as at several places in various lessons cross-references are made to other modules. To keep students going is a legitimate reason to lock the former lessons, but it may be worthwhile to reconsider this constraint when it is going to be used for real by professionals. Perhaps it is possible to treat the two target groups differently in this respect?

Another need I discovered after a while was to go through the exercises a little bit more quickly or to skip them. For the reasons mentioned above, some (parts of the) lessons are not highly relevant for all professionals. Therefore some exercises are not very challenging either, especially while some are meant to assess correct reading and factual knowledge – like the historic order of events – rather than comprehension.

With respect to the exercises, it would also be helpful to add feedback when mistakes are made in the exercises. In the present situation one does get to know that an answer is incorrect but not why it is incorrect. One can even discard the wrong answers and try again repeatedly till all answers are correct. I tested this deliberately in order to find out what this would provoke, for instance redirection to the start of the course. But nothing pedagogically happened. Therefore, I am curious to find out what is being recorded for statistical purposes and how corrections are documented and I look forward



to an evaluation of the exercises. Although it may not give a hundred percent reliable results due to my experimental behaviour.

Some of these needs are of course personal and may not be relevant for others at all, as can be concluded from the positive results from the questionnaire (Šne; Marciniak & Chwieduk in this volume). Others appear to be rather common however. For instance the principles of flexibility, personal attention and significance of the training material are acknowledged by developers of e-learning applications as main criteria for a successful development process (Girona 2008, 35 – 40). They add to a considerable degree to the acceptance and success of an e-learning application. If the project team wants to serve my target group just as good as the students, it may be worthwhile to look into the possibilities to meet these principles. Although I realise that the personal needs are highly individual and more difficult to satisfy.

Figure 2 The e-learning module looks attractive, with colour pictures, graphical features, etc. Even the exercises are vivid due to high-tech features, like drag-and-drop-facilities.



Appearance

The graphic design may not seem to be the main thing to look at critically. Yet, besides the pedagogical and functional design, this is considered to be the third crucial element in developing a digital learning environment (e.g. Girona 2008). As style and aesthetics highly contribute to quality it usually requires the involvement of a specialist.

The first impression is very positive: the application looks appealing (see Figure 2) and is user friendly. One quickly gets acquainted with it. The buttons for instance are clear and uniform throughout the entire course. This is highly admirable since various modules were developed by various teachers in different countries. Moreover, you cannot get lost in a module as you can always see your progress and how many pages are left to work through.

A minor point of attention concerns the texts which are incorporated as a scanned image. Their quality is not always optimal for reading. Furthermore, some texts are a bit long for reading from the screen (see Figure 3). The

Figure 3 Some texts are a little bit long for reading on the screen.

illustrations are functional, but in addition it would be interesting to add other multimedia tools like sound, animations, video, simulations etc.

Compared with the technical facilities that were available two decades ago, when I started to build electronic applications for teaching use-wear analysis on flint tools (Van den Dries 1998), a tremendous progress has been made. Back in the nineties we were very happy that the technological developments only just enabled us to incorporate digital photographs directly taken from the microscope (although the resolution was not very good yet), digital drawings, and graphical features like menu boxes, tic-boxes etc. Today large amounts of hard disc space are available and there are hardly any restrictions as to working memory left. So beautiful graphics can be included, sound and video, animations, virtual reality and all sorts of facilities to enable interactivity.

Yet, not a lot of the technological innovations, such as multimedia facilities and internet connectivity have been applied in this application so far. Usually this has to do with the limitations of the applied software environment rather than with the limited creativity of the building team, but in either case the learner may miss such things. The contemporary client of e-learning courses can be expected to have rather high expectations and wishes with respect to the technological functionality of such facilities. Not merely because the new generation of students grew up in a digital age, but also because most of today's learners will be used to high standards of information technology. Moreover there is a lot of information available on advancements in information technology and on the contingencies they offer for education (see for instance Siozos and Palaigeorgiou 2008). Presumably nobody expects the latest innovations in information technology to be applied immediately, but one does count on facilities which are already fairly common, like links to websites (for instance of heritage sites and organisations, museums, libraries and repositories), direct access into catalogues or other databases, connections to web cams and maybe even the incorporation of virtual reality (reconstructions, simulations).

Value

What is the value, the educational gain of the new e-learning application? In the nineties, the expectations of e-learning were very high, as with all new developments in this field. In the last decade a number of examples showed

that these high expectations have not been fulfilled. For example a comprehensive inventory, that was carried out in 2005 by the Organisation for Economic Co-operation and Development of universities in 13 countries, made clear that e-learning had not yet had a significant impact in the classroom (OECD, 2).

The reasons for the shrinking enthusiasm are manifold. One is that employing e-learning at educational institutions does not reduce costs. Not only its development is time consuming, but it still requires teacher guidance and support (Laurillard 2001, 6). A more important reason probably is that various empirical studies have not yielded clear and substantial evidence that students increase their academic achievements as a result of using information technology (see Cuban 2001, 133), although there does seem to be a positive relationship between the use of online multiple-choice exam and student performance in summative examination (Burridge & Öztel 2008).

Another reason for the dimmed enthusiasm is that e-learning has not brought as much pedagogical renewal as was expected. According to Cuban (2001), 'an overwhelming majority of teachers employed the technology to sustain existing patterns of teaching, rather than to innovate' (134). Innovation does take place in education, but not as a result of the introduction of technological features, rather the other way around. It must be admitted that with this training as well, we act contrary to the modern tendency in teaching theory to apply cooperative learning, using work environments as training environments. An e-learning course like this holds on to the traditional way of teaching with teacher instructing a particular issue in a particular order. Also the full potential of the internet technology, like interactive engagement and interconnectivity has not yet been exploited.

There are, on the other hand, positive experiences as well. Evaluations have for instance pointed out too that people surely are interested in e-learning (Laurillard 2001) and that actual learners – also of archaeological applications – highly appreciate their use (see Carreras 2008, 70 – 75). This was certainly the case with the participants of the testing group of the application on archaeological heritage in contemporary Europe. Even though we noticed some imperfections, we had a very positive experience (see Šne; Marciniak & Chwieduk in this volume).

Moreover, there is surely a potential market for this kind of applications in archaeology. Not only are there lots of potential students in remote locations that may not have the opportunity to attend a classroom course on a weekly

basis and for whom e-learning would be a fine alternative. There are also numerous professionals for whom it is important to keep developing their skills and knowledge and to take post-graduate courses. So, as long as it serves a demand, there is sufficient reason to keep developing e-learning applications such as the one discussed.

For the application discussed, it can in any case be claimed that it fulfils the need from the international community of heritage managers to embed more employability within the academic curriculum by preparing students for the complex and demanding context of contemporary archaeological resource management (see for instance Bender & Smith 2000; Aitchison & Giles 2006). It is needed, for example, to raise awareness with students of the systems, institutions, issues and dilemmas they are going to be confronted with in their professional work, to develop skills like intellectual curiosity, personal responsibility and initiative. The application addresses such issues, as was pointed out in the former paragraphs. It even provides case studies from acknowledged good practices, invites to debate and to write an essay and offers enhancement of social skills by including team-working (writing an essay together). Merely the practicing of more practical skills by means of work placements could be added to enrich the student's qualifications for the real world of heritage management even further.

Whether it should replace face-to-face learning in the class room is something else. I am inclined to say that it would not be ideal for graduate students if e-learning would substitute the class room meetings entirely. It impoverishes their academic training due to a lack of personal contact with fellow students and with the teachers. But I certainly would accept this module it as an introductory course and enhance it with both face-to-face courses and training in a practical environment.

Conclusion

It shows off clearly that the project team has put a lot of effort in building the e-learning application on heritage management. This worked out very well. Technically it works smoothly, graphically it is looking good and its content truly suits its educational purposes.

It can be very useful for both heritage management students and practitioners. The latter get a refreshment of both theoretical aspects and practices and an up date on discussions and developments. While there is a growing tendency to stimulate life-long learning and, consequently, a growing

demand for post-educational education (at least in the Netherlands), the supply is not adequate yet. Applications like these can help to fulfil this demand.

There are some wishes left as well, but they primarily belong to the category of enjoyable extra's rather than of the necessary improvements. For instance, a further exploitation of the comfort that the internet technology offers would surely add to its value. In any case it would make its use more efficient for the target group of the professionals.

The differences of needs between the two target groups illustrate however that it is difficult or maybe even impossible to serve both target groups equally with one application. Probably it would be much easier to develop tailor made modules if different types of learners are to be satisfied.

But for both target groups the present application is already a valuable starting point. And I hope it will be employed heavily. At the same time I hope that this fine basis will be developed further. There lies a beautiful challenge to further exploit the abilities of the internet in a way that the next generations of students will expect, or – even better – will astonish. I am already looking forward to it.

Notes

- 1 It was not intended to include an assessment of the benefits versus the costs of development in this review. Information on this is provided by in other chapters in this book.
- 2 For a total of thirteen modules rather than fifteen. Apart from one lesson that was missed, one lesson was not provided.
- 3 A VLE is defined by Wikipedia as 'a software system designed to support teaching and learning in an educational setting [...]. A VLE will normally work over the Internet and provide a collection of tools such as those for assessment (particularly of types that can be marked automatically, such as multiple choice), communication, uploading of content, return of students' work, peer assessment, administration of student groups, collecting and organizing student grades, questionnaires, tracking tools, etc. New features in these systems include wikis, blogs, rss and 3D virtual learning spaces.' See http://en.wikipedia.org/wiki/Virtual_learning_environment (Entered on August 1st 2009).
- 4 This was not just my conclusion. I asked another member of the test panel, who was part of my target group, for her opinion, and she was very positive on the contents as well.

5 See <http://conventions.coe.int/>

6 See <http://archaeology.leiden.edu/graduate-school/masterprogramme/programmes/heritage-management-in-a-world-context.html>.

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08

Teaching by distance learning or face to face: the differences between direct and distance teaching *Marjolijn S.M. Kok*

Introduction

In this paper I will explore some of the differences involved in teaching either directly in front of a classroom with students or at a distance through the interface of a computer. The participation in the Leonardo project *E-learning as a tool of knowledge transfer in the field of protection and management of archaeological heritage* on distance learning and the experience of direct teaching have led to several observations concerning the differences between teaching by distance learning or face to face. Through direct teaching I have taught theory, gender archaeology, landscape and heritage, fieldwork and field administration. Distant learning was a new experience. The distant learning course consisted of 15 modules written by authors from six countries: England, Germany, Latvia, the Netherlands, Poland, and Sweden. Although the subject matter of each module was at a European level, experience at the national level could be brought to the fore. In co-operation with Heleen van Londen four modules were written from a Dutch perspective. These were module: Mentalities and perspectives in archaeological heritage management; Cultural biography of landscape; Sustainable development in the archaeological heritage sector; and Commercial archaeology. English was the main language within the project, but where necessary modules were translated into the national language. This meant that all of the original course material was first written in English. The participants from all countries could comment on this first version before it was taken into production by a multimedia team based in Poland.

The philosopher Derrida argues that speech has no priority over written text as both are similarly inadequate to convey perfect communication, where the meaning of the words of the speaker/writer correspond perfectly with the

meaning the audience understand these words to have. Perfect communication is, however, seldom a goal of teaching. The content of a course can be similar but the way of communication is very different. The written word (by hand, more and more on a computer) differs from the spoken word (verbally, usually face to face) in the way the speaker/writer interacts with the audience. Although the outline of the course is similar for both ways of teaching, the infill is quite different. The preparations and performance needed for a lesson differs depending on the type of interaction taking place, either direct or at a distance through an interface.

Direct teaching

When teaching face to face I seldom write out the entire text of a lesson. The outline is filled in with key-words and only definitions or quotations are written out. In this way when actually teaching I will not forget important elements, but I can speak more freely. My eyes do not need to focus on the text and I can look at the students. The expression of the students, not just their faces but their entire body language, is very important in assessing the way the lecture is received. I can react instantly by elaborating more on a point or skipping introductory knowledge. I have noticed that students are more apt to ask questions or make points when they have the feeling you talk rather freely. It is less of an interruption and after the question is dealt with you do not need to continue with a prewritten text but can continue in the same strand of speaking. At the same time I can question the students directly about what they have been told and respond to their reaction or assess their level of participation and/or understanding. Furthermore, teaching often involves multiple lessons and during a course you can rehearse, repeat and respond to the difficulties students bring to the fore.

Distance teaching

With distance learning the preparation is quite different as you have no direct interaction with the students. You have to anticipate what keeps the students attention and whether they can understand the information. During the course there is no room for alterations as the making of the modules costs too much time and money.

As this was our first experience with distance learning, the content of the modules for the Leonardo project were co-written by Heleen van Londen, at the start we had no real idea of what exactly was needed. We wrote a text that

was more or less an article. It was a continuous text with a clear storyline and long paragraphs complete with references. In other words, it was more or less like a narrative you would tell your students within a classroom.

From the digital library we were used to reading articles on-line and had not thought about the length of the text any more than it should not exceed twenty pages per module. In the Leonardo project the archaeologists wrote a text that was converted into a syllabus by the Polish multimedia-team of whom Dorota Bochenska and Agata Prinke were our contact. Once we saw what the end-product looked like we realised our approach had to change. The main change was that the text should be divided into coherent independent units that would fit on one page. In other words per module we had to write about twenty small lectures. And like a course these small lectures should form an understandable narrative. The text needed to be bite-sized. This required a new look at the text which focused on the essence of what was important and how it formed a unit. And usually this, for us, a small unit would be cut up further into inter-active scenarios. These small units also needed illustrations to keep the course attractive.

Although we usually use illustrations during lectures it was more difficult to find illustrations for all small units, especially when they were of a more theoretical nature. Luckily within the project there was room for the production of new drawings that could exemplify specific ideas. Here, the cooperation with the multimedia team was essential. Visibility and clarity were important elements that had to be kept in check. The meaning of the pictures should be clear and should not contain too much detailed information. In other words, the drawings should clarify instead of being picture puzzles. Puzzles were included at other moments when the students could test themselves. We had received some examples of puzzles that could be included. Most included some form of yes/no answers. Here again it was more difficult to find suitable puzzles for the more theoretical parts. Rights and wrongs are not always present and this is something you also want to teach your students. This remained a problem that could only be partly solved by adding small texts when the so-called solution came up.

The insertion of clear references allows the students to further their knowledge or look up extra information about the subject. In the modules there were, however, no references as in articles but bibliographical information was put in the last section of each module. During a direct teaching course it is normal to refer back to previous lectures or explain something

that will be dealt with in a later part of the course. Our cross references to other modules were not taken up in the actual modules, as each small text should stand on its own.

The teaching itself was for us a strange affair as, except an introduction hour, all was done through e-mail and monitoring. We could log-in on the web-site of the project. Here the different modules could be opened, but also the progress of the students could be followed. Students could use the modules and a forum to discuss with other students. The questions we received from students mainly concerned technical problems. We received no assignments from the students. This could be partly due to the fact that most of our students were professionals who did not need the credits. We did not push this issue as people were taking part in their spare time.

Try to define how AHM is organised in your country following the concepts of a positivistic and/or interpretive approach. Use the characteristics given and answer with yes and no.

Here we give the characteristics in question form of the sco7 drop and drag scheme only now they can choose a yes or no. when finished an answer appears.

Questions

- 1 Does preservation focus only on single objects?
- 2 Is there a scale on which monuments are valued?
- 3 Are archaeological remains viewed as a finite resource?
- 4 Are the people professionally dealing with archaeological remains all archaeologists?
- 5 Are archaeological monuments fenced in?

Answer

- > *If all yes:* text appears 'AHM in your country is organised in a positivistic way.'
 - > *If all no:* text appears 'AHM in your country is organised in an interpretive way.'
 - > *if yes and no answers:* 'AHM in your country is organised in a diverse way using both positivistic and interpretive elements.'
-

Figure 1 Example of a puzzle from the *Cultural biography module* as described in the syllabus which was used by the multimedia team to create an interactive element. In italics the actual text on screen, underlined the multimedia description.

Evaluation

The participation in the Leonardo project has been very useful as it gave us the opportunity to participate in a new way of learning at a European level in a subject of our interest, archaeological heritage management. Not often do you get the opportunity to really experience a new teaching method and actually prepare part of the course material. The international character of the project gave an insight into how others teach and work with students and how they deal with archaeological heritage management. This allowed for reflection on our own way of teaching and dealing with archaeological heritage management.

The major advantage of distance learning is that you put a lot of energy in the preparation of lessons which leads to a complete narrative with a very clear structure. Sidetracks are reduced and recognisable as sidetracks as they are defined as examples. References have to be exact and are for students easier to find. In direct teaching I often point to literature when usually a full reference is not given as this will hamper the flow of the lesson.

The difficulties come to the fore in the shortness of the text-units of the distance learning. All the separate units quickly get a matter-of-fact character. Which is enhanced by the interactive elements that allow mostly yes/no questions. Short sentences are not good for explaining, especially complex things such as heritage management with its diverse angles. Studies in the Netherlands have shown that coherence marking will lead to better text comprehension, especially when the reader has little knowledge of the subject. Although this effect is stronger at low levels of learning (Land 2009), it was also relevant for test subjects with a higher education (Kamalski 2007, 216). The same principle seems to apply to text written by social servants for public purposes. When they wrote sentences that were too simple the public had more problems understanding the text (Sanders 2009). It seems that complex sentences with coherence markings may give the impression of being difficult to read, but lead to a better understanding.

Linking words between sentences and paragraphs guide the reader. In a textbook on academic writing it is demonstrated that '...linking words and phrases can help a writer maintain flow and establish clear relationships between ideas.' (Swales and Feak 2007, 27). Linking words are nearly absent between the different text units in the distance learning course, which may lead to a lesser understanding of the complete text. Students and teachers may not be aware of this lesser understanding. As on the one hand, students

form their own mental picture that fits their previous knowledge, which is not necessarily the context the teacher is writing about. And on the other hand, the text and the questions in the distance learning modules both have a factual instead of an understanding character. Nearly all tests within the module can be made by just going back in the texts. The level of reproduction is tested instead of the level of understanding.

Another positive aspect was the international character of the project which allowed for a diverse view on heritage management. This enlarges the awareness of students that local solutions to heritage management are not necessarily the only solutions. Different approaches may lead to good results and at the same time not all archaeological heritage should be approached in a similar manner. For example, it may make Dutch students aware of the peculiar nature of what they call archaeological monuments in relation to other countries. In the Netherlands many archaeological monuments are located underneath the soil and their content is estimated. This leads to the different involvement of the public into local heritage management than in countries where archaeological monuments are clearly visible and part of everyday life. The problems we all try to deal with in our work are shared by other people and solutions may be found outside our national borders. Furthermore, archaeology is taken into a wider European perspective which can lead to the appreciation of other people's heritage. Case-studies across borders and this may give students an incentive to more actively use data/information from other countries not only in this course, but in other courses as well. The international character also gives an awareness of the possibilities of studying archaeological heritage management in different countries. There is, however, a disadvantage related to the different authors from several countries in the sense that the style of the modules changes throughout the course. When reading the different modules you have to adapt to the different levels of insight that are required by the reader. This can lead to the impression that the course has some imbalances. Although we had long sessions on the content of modules, they were often written simultaneously and the actual content could differ from what we expected. This made it difficult to anticipate if certain information was given elsewhere or would be left out. What is considered relevant for specific subjects can vary considerably between the different authors. Although the structure of the entire course was planned some elements are missing from the text and others are repeated. In our comments on each others texts we could point to the elements we

thought that minimally should be put in. No major elements have been left out, but the coherence of the entire course is not optimized. The fact that the other authors read your texts did give insight in to your own flaws and could be used to overcome your own oversights. Comments have to be precise to be the most useful. Not only when your module is commented on, but also when you comment on other modules, precision helps you to think clearly about what you think is important to communicate to the students and how to communicate this knowledge.

Finally the important element to evaluate is the actual experience of teaching. Here what is prepared becomes reality. We had opted for an introduction hour as the Netherlands is a small country this was no problem and the participants were keen to come. People, who came to this introduction, also followed all the modules. This was less the case for the people who did not come to the introduction. Especially with professional working people, the fact that it was voluntary meant that the urgency to do the course was absent. Although they had been interested in the e-learning project in itself, actually following the course seemed less interesting. This could be due to the generally high level of knowledge about heritage management of most archaeologists working in this sector. But also the absence of direct contact with co-students could be seen as a setback as networking opportunities are less present. Networking is an important reason for attending all kinds of informative meetings.

As a teacher the distant learning course was an alienating experience, I could monitor the progress of the students. I could follow if they read all course material, but I had absolutely no idea if they had understood anything they had read. For me one of the joys of teaching was completely gone. I always find it very rewarding to see a student who is struggling with a subject, coming to grasps with that subject. Direct contact is essential for this kind of experience. The level of understanding might have been more obvious when the participants would have made the assignments, but we had no way to force them to make these. Pressuring students is also something we are not familiar with within our teaching practice. Students are very independent and will not accept pressure of any kind. The grading afterwards is the only means of pressure we can use. This is also how we want to teach, students should come of their own accord. Here the social aspect of direct teaching is of major importance. The contact between students and teachers

is enough to motivate students. They understand that through this contact they will learn in a more easy way than by just studying books.

Maybe this sounds old fashioned as students nowadays are constantly chatting and e-mailing on the internet, but I still think that face to face contact has extra value. It is not just what is communicated in words, it is the whole of postures, gestures and facial expressions that makes you realise that a student has understood what you tried to teach.

Conclusion

Although the participation in the Leonardo project on E-learning has taught me much, I have not been convinced of its extra value in teaching complicated subjects like archaeological heritage management. This may be due to the smallness of our country and teaching traditions. The time and effort that go into preparing the modules and following the students at a distance do not lead to better education. In cases where accessibility is a problem it could, however, be a solution.

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09

Arkeonet: an e-learning pilot programme in science and technology applied to archaeology

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Introduction

The present paper aims to describe *Arkeonet*, an e-learning programme in archaeology that the Aranzadi Science Society has conducted for the last three academic years. First, we shall introduce Aranzadi as an archaeological organization and the context in which this e-learning programme arose, as well as its objectives. Secondly, we shall go through a description of how the programme is organized (materials, classes, evaluation, final paper). Thirdly, a detailed description of the content itself will be presented, explaining the most important activities that students carry out in each module. Finally, we shall end this article by presenting the conclusions drawn from the experience of the last three years.

Origins and objectives

The Aranzadi Science Society was founded in 1947 as a not-for-profit association, and has retained this legal status to the present day. The society's stated aims include pure and applied scientific and technical research into problems and issues related to the natural and human environment; dissemination of this knowledge and of the results of the research conducted; and protection and conservation of archaeological, ethnographic and natural heritage. Among its 13 Departments, Prehistoric and Historical Archaeology, together with Physical Anthropology are the three directly involved in the above-mentioned e-learning pilot programme.

The current activity of the archaeology departments is linked to the historical and cultural context in which Aranzadi mainly carries out its

activities (Autonomous Communities of the Basque Country and Navarra). Thus, the Prehistoric Archaeology Department is highly specialized in Palaeolithic and Iron Age sites; the Historical Archaeology Department works mainly with castles, old farms and urban plots; and as for the Anthropology Department, it has traditionally dealt with human remains and necropoli in the region. However, since 2000 its main activity has been exhuming mass graves from the period of the Spanish Civil War using archaeological methods.

Although Aranzadi's experience in archaeological excavations and research goes back more than 60 years, the members currently involved are fully aware of the developments which have taken place in archaeology in recent decades. On the one hand, the material evidence which is unearthed is considered not as a mere tool for dating the culture under study, but as a means of understanding the values and thoughts of those who used and produced it. On the other hand, the archaeological method traditionally applied to prehistory and ancient history has also been used in Mediaeval, modern or industrial contexts. Thus archaeology has become a science with its own method, able to create a historical interpretation from material evidence.

These two points, together with the current application of leading-edge technologies in archaeological research, increase the need for the archaeologist to be competent in different areas of knowledge, and also to introduce an interdisciplinary approach into his or her studies.

The underlying educational structure is another important factor which has been taken into account in designing the programme content. In the Spanish university system there is no degree in archaeology. Most professionals and researchers working in the field of archaeology have a Master's degree in history. Depending upon the university, they may have a 'mention' or 'specialization' in prehistory or ancient history, having taken some courses in archaeology. However, as stated above, this is not enough to become a fully competent archaeologist nowadays.

In the case of the Basque Country, two universities offer a Master's degree in history. One of them, Deusto University, includes one single subject in the field of archaeology. Meanwhile, the University of the Basque Country provides a more thorough education in this field, including in its curriculum thirteen archaeology related subjects, eight of them being specific for prehistory: Methodologies and research techniques (both in archaeology and history), Historiographical trends (both in archaeology and prehistory), Archaeology in historical times, Archaeology in classical cultures, Archaeology

of architecture, Typology, Prehistoric art, Prehistory of the Iberian Peninsula, Stratigraphy, Environmental archaeology and Graphic support for research in prehistory.¹

Hence Arkeonet's aim is to respond to archaeology's development into a more complex science and the essential use of new technologies which – in the Spanish system at least – has so far not been reflected in university curricula. The aim is to provide students with a general overview of the methods and leading-edge technologies being used in today's archaeological projects. The target groups are both students wishing to follow a career in archaeology and professionals who wish to be brought up to date with the new trends and approaches.

Organization and functioning of the training programme

Arkeonet is organized jointly by the Aranzadi Science Society and the Asmoz Foundation, with Aranzadi being responsible for the teaching aspects of the programme (selection of topics, design of content, selection of tutors etc.) and Asmoz providing the e-learning platform. Other organizations such as research centres, archaeological associations and companies from the region provide support for the organizers by receiving students for field work in their excavations.

The programme has a duration of 350 hours: 250 hours devoted to theoretical and practical content (from October to June) and 100 hours to archaeological excavations (from June to September). Although initially it was compulsory to attend classes once weekly, currently the programme may also be taken wholly online. However, this latter option is available only for students outside the region, since we consider the practical classes to be a key part of the training process.

The e-learning platform is based on Moodle, which is provided and supported by the Asmoz Foundation, the joint organizer of the programme. It allows for the storage of materials and for interaction between tutor and students, amongst the students themselves and between students and organizers. All training-related contact between tutor and students is to go through the platform, so that all students may benefit from discussions and explanations. Other features of the platform which have proved really useful for the programme are the possibility of organizing discussion forums, at news section and communication tools. The theoretical part is divided into 27 modules, each consisting of the following elements: contents,

Monday	Tutor uploads the teaching content and complementary materials.
Tuesday	Students go through the contents and if necessary, ask questions or request further explanations.
Wednesday	They answer the comprehension question.
Thursday	
Friday	Practical class (4 hours). Students are provided with the evaluation exercise.

complementary materials (maps, examples of reports, pictures...), links, bibliography, a comprehension question, the practical class, and an evaluation exercise. Each tutor decides on the most relevant contents to include in his/her module, as well as the materials students may use to study the subject in depth. While the materials provided are mainly an overview of the subject, the classes always have a practical focus, stressing the potential of the particular discipline / technology for solving research problems, as well as its methodological limitations.

As for the actual organization, the tutors upload the contents, complementary material and links to the e-learning platform prior to the practical class. So, students have time to familiarize themselves with the subject-matter, ask for further explanations and answer the comprehension question, which will enable the tutor to assess the depth of the students' understanding prior to the practical class. This latter is held on Aranzadi's premises every Friday afternoon and has a duration of 4 hours. In some cases visits to laboratories (e.g. a conservation laboratory) or research centres are organized. The functioning as described above is arranged on a weekly basis, according to the schedule above (Figure 1).

The evaluation exercises are a means of putting the knowledge acquired in each module into practice. They consist mainly of solving a problem related to the technology, scientific discipline or area of knowledge explained in each case, such as may arise in a real archaeological excavation or actual research. The aim of these exercises is not to repeat the theoretical contents in which each module is framed, but that the students should apply the tools

presented in each module to real cases. For instance, an evaluation exercise may ask students to prepare a working methodology or proposed technological application, to analyse actual laboratory results or to work with certain software. This weekly assignment allows the tutor to assess the learning process on a regular basis. Students are required to successfully complete at least 80% of the exercises set. However, the final evaluation will be completed with 100 hours (two weeks) of practical work in an excavation. The objective is to perform a specific task set by the director of the excavation, which will be written up in as a final essay.

Content

Over and above the e-learning programme, which is in itself an innovation in the training of archaeologists, Arkeonet is not traditional training, in that it aims not only to provide specific and theoretical knowledge, but also to familiarize students with the new methods of modern archaeology, always taking an interdisciplinary approach. The areas of knowledge chosen are the disciplines, technologies or topics currently used in, or related to, archaeological research, in both field and laboratory work. Some of them (e.g. Ground Penetration Radar) are rarely used in small or 'rescue excavations',² so the programme provides an opportunity for the students to become familiar with them, while others (e.g. Prevention of Risks at Work) are prevalent in archaeological work but generally ignored by the educational system. We may say that most of them are not included in academic curricula, and the few that are (e.g. palaeobotany) are approached solely from a theoretical point of view, neglecting the practical and methodological aspects. With all events, we emphasize that every topic is presented in a very practical way, showing the students devices or materials whenever possible and getting them to reproduce laboratory work.

In order to gain a more complete overview of the contents included in the programme curriculum, we have grouped them into four categories: Legal and Management Issues; Research Methodologies; Auxiliary Sciences; Technologies Applied to Archaeology and Conservation. Below we present a short description of each of the topics included in Arkeonet, including specific explanations of the teaching approach and content.

Legal and Management Issues

Under this point we have included those topics that are essential when

Figure 1 Weekly organization of the training programme.

organizing an excavation or research project, but are not directly linked to archaeology as such:

- > Archaeological Legislation and Regulations: Aims to explain the procedures laid down by cultural heritage law. It deals mainly with how to obtain an excavating license, applying models for excavating or research grants, storage of materials and access to past reports and excavation logs;
- > Prevention of Risks at Work: This module presents the Spanish law on the Prevention of Risks at Work as it applies to archaeological works (excavations, prospecting, etc.) The aim is to make students aware of the importance of having a Risk Prevention Plan in any excavation, as well as adopting safety measures during field work;
- > Intellectual Property Rights: Both the researcher and the archaeologist are continuously generating material protected by property rights (reports, essays, papers, photographs, etc.) The aim of this part is that students should know the property law applicable in each case according to the labour relationship and the material produced, so that they may protect their copyright.

Research Methodologies

Under this section we have included different areas of knowledge that complement and support archaeological research in its different stages.

- > Accessing bibliographical resources: This is an introduction to documentary research, providing an overview of the arrangement of libraries and archives, as well as currently available online resources. It focuses on strategies and tools for searching the Internet;
- > Methodology of archaeological prospecting: The aim of this module is to introduce archaeological prospecting as an element in archaeological research. The information gathered during prospecting needs to be arranged systematically so that it may be used in subsequent research or excavations in a methodologically sound way;
- > Types of archaeological deposit: The main objective of this module is to present the varieties of archaeological deposit, as well as their specific problems and the research strategies to be applied in each case.
- > Dating systems: Although this topic is usually covered in academic curricula, the purpose of its inclusion in the programme is to provide an understanding of the foundations of chronology as applied to archaeology. It aims to show the capabilities and limitations of the most

commonly used dating systems, and to compare the ones that are most useful in common cases. Finally, students are trained in the critical interpretation of figures and diagrams for geo-chronology;

- > Stratigraphic series: This introduction to sediment analysis aims to show all the information that may be extracted from a thorough analysis of the sediment in which the archaeological elements are embedded. In addition students carry out real analysis in a laboratory, performing the process from collecting samples through to interpreting the results of the analysis.

Auxiliary Sciences

The inclusion of these sciences and their application to archaeological research underscores the interdisciplinary approach that Arkeonet intends to promote amongst students. The approach remains mainly practical, although the theoretical framework is a must. Students will be provided with reports and studies conducted for actual archaeological research, as the best way of showing how other disciplines contribute to archaeology.

- > Geological context: This includes a short presentation of the geological history of the region along with explanations and examples of the information that geologist may bring to archaeological research (identifying materials used, geographical origin, etc.);
- > Palaeobotany: An introduction to the science of palaeobotany and how it helps the archaeologist to describe environmental conditions. The content includes analysing botanical remains, methodology and an interpretation of pollen diagrams;
- > Palaeontology: An approach to the methodology and objectives of this auxiliary science, essential as it is to archaeology. The aim is to show heuristic potential with regard to animal evidence along with capabilities and limitations of faunal analysis. It is divided into two modules: one for macro-fauna and the other for birds and micro-fauna. Apart from studying the theoretical framework of each area, students will handle actual animal remains, using Aranzadi's reference collections of macro-fauna and birds;
- > Physical Anthropology: The aim is to present the working methodology of this discipline, as well as illustrating the kind of information that an anthropological analysis may furnish. This presentation is complemented by practical laboratory sessions in the Forensic Department of the Faculty of Medicine;

- > Analysis of metal objects: This is a compendium of three disciplines: archaeometrics, palaeosiderurgy and archaeometallurgy, all of which are necessary for understanding and interpreting the analysis of metal objects. An overview of the features of metals and their combinations is followed up with an introduction to the methodologies and technologies most commonly used for this analysis.

Technologies

The list of technologies applied to archaeology aims to provide an overview of the major role that technology currently plays in archaeological research and excavations. In general the modules present methodological guidelines to take into account when using and applying such technologies so as to ensure the validity of the results in the framework of a scientific research project.

- > Cartographic Information Systems: This module is intended to provide students with a general overview of the main foundations of cartography, as well as existing digital tools for obtaining cartographic information. Another main objective is to familiarize students with questions to consider when making a map (a fairly common task for an archaeologist: for including in reports, papers, presentations, exhibitions, etc.);
- > Geographical Positioning Systems (GPS): This module aims to show how GPS work and present the possibility of processing the recorded information with appropriate software as well as GPS applications in archaeology;
- > Topography and total station: Together with an explanation of the working methodology, and the features and capabilities of the technology, students undertake practice sessions with a station, taking measurements and making a map with the data obtained;
- > Laser topography and 3D scanning: The aim of this module is to show existing systems for digitizing archaeological objects. The presentation covers aero-spatial detection systems, digitization with laser technologies and 3D scanning. These technologies are seldom used in ordinary excavations, so it is an opportunity for students to see actual results obtained with them in the field of archaeology;
- > Digital photography and computer-aided design: Photography and planimetry are presented as key tools for recording the archaeological features. Together with working methodology, software and tools are presented, in addition to an introduction to photogrammetry;

- > Ground Penetration Radar (GPR): The fundamentals of how GPR works are explained, as well as how to interpret the diagrams generated by the device. Students have an opportunity to handle a GPR, learn the limitations of its use and check actual reports on the advantages of this detection system when used within a correct methodological framework;
- > Photography applied to archaeology: A practical guide to how to optimize the use of photography as a key working tool for the archaeologist. The module provides information and recommendations about the best way of carrying out field work as well as organizing and preserving the documentation. The aim is to enhance the quality of the material generated and the organization of working archives;
- > Video-making applied to archaeology: Nowadays it is relatively easy to get the equipment necessary for producing quality audiovisual media that record the site, its environment, the tools used, the methodology, the people participating, their impressions, etc. The aim is to teach the skills necessary for recording and editing an 'audiovisual report' (documentary) about an excavation;
- > Databases: The process of designing, implementing and using databases presents an additional difficulty in the archaeological context, due to the large volume of information generated and the lack of a specific standard application for it. This module aims to provide solutions to the problems that most commonly arise during the life-cycle of the database applications used in archaeology.

The programme is supplemented by presenting basics of conservation and preservation of the archaeological substance. These comprise:

- > Conservation treatment for archaeological objects and materials: The theoretical framework of this module aims firstly, to provide general guidelines on how to preserve archaeological elements during excavation and field work; and secondly, to explain how these materials need to be treated in order to be stored in the best possible conditions for their conservation. There is one class for presenting the theoretical framework and another one held in a specialist conservation and restoration laboratory for archaeological materials;
- > Restoration and consolidation of structures: This module is an introduction to restoration criteria, explaining the specific problems of different materials used for cultural heritage structures, namely stone and wood.

- Technologies and approaches to dealing with each case are presented;
- > Conservation of architectural elements: The contents are divided in two parts, one consisting of technical problems and solutions (foundations, movements of structures, stabilization, etc.), and the other one focussing on conservation criteria from a historical point of view: reconstructing, removing or adding elements, reversible actions, use of the building, etc. Students assess and discuss different buildings restored or reconstructed for different uses.

The fact that the Aranzadi Science Society is itself an interdisciplinary organization is the reason why it has been possible to include such a complete range of topics. The connections between different disciplines and areas of knowledge are one of its specialties. We may point out that all the experts participating in Arkeonet are linked in some way to Aranzadi.

The teaching staff includes university lecturers (e.g. in Palaeobotany, Anthropology), archaeologists (e.g. Prospecting, Computer-Aided Design), experts in different technologies who collaborate regularly on Aranzadi's projects (e.g. GPR, Video), public authority staff responsible for cultural heritage (e.g. Legislation, Conservation of archaeological elements) and finally, active members of the Aranzadi Science Society (e.g. palaeontologists, stratigraphists). To have a teaching staff with such diverse backgrounds and experience in an archaeological programme is in itself innovative. This, together with the selection of topics that make up the programme, ensures that the archaeological work is conducted from a theoretical, management and technical point of view. This triple perspective is a must for any archaeologist nowadays.

Conclusions

Over the last three years, around 40 persons have taken part in the Arkeonet programme. They have come from diverse backgrounds: students, working archaeologists, cultural managers or just people interested in archaeology with some amateur experience.

According to their feedback, the interdisciplinary approach has been implemented successfully and the relevance of new technologies applied to archaeology has also been made clear. The programme's participants have become aware of the wide range of disciplines and technologies involved in archaeological research and hence of the need to have an overview of all the

existing possibilities in order to solve a problem or question within an excavation or research project.

As for the delivery of the programme by e-learning, it has become apparent that this is one of its major strengths, thanks to the flexibility and the independence to organize themselves freely students enjoy this method of delivery. The practical classes, held every Friday, were regarded as necessary and very useful, especially in the modules related to applied technologies or auxiliary sciences.

Another factor appreciated by the students was the tutors. In general, they considered that the tutors were well qualified in their respective areas of expertise. The materials provided (teaching modules, reports, links, bibliography, etc.) were also positively assessed. The tutors were regarded as willing to share their knowledge and generally available to resolve questions or provide further information.

When asked about possible improvements, students suggested including other topics and areas of knowledge such as submarine archaeology, specific methodological tools for excavating (e.g. the Harris matrix) and an introduction to project management.

In conclusion, we may say that the pilot programme has been a success and has highlighted the need for this kind of training. Over the coming years, the challenge will be to adapt the programme structure to the new educational curricula that will be issued from the Bologna Process, paying special attention to a Master's degree in archaeology. Looking now to the future, we believe that the teaching experience gained over the last few years has laid the foundation for offering other e-learning programmes, both those with a different structure and organization (shorter and more specialized programmes in particular areas of knowledge) and those with new archaeology-related content (e.g. archaeological heritage management).

Notes

1 This overview of degrees and curricula existing in the field of archaeology will doubtless change with the application of the Bologna Process to both undergraduate and postgraduate studies.

2 By 'rescue excavations' we mean the compulsory analysis and excavation of every piece of archaeological evidence that emerges during any civil engineering or building work, as provided by Spanish law.

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Archaeology and Construction Engineering Skills: developing e-learning for two sectors *Kenneth Aitchison*

Archaeology and Construction Engineering Skills (ACES) is a transnational project, funded by the European Commission's Lifelong Learning Programme under the Leonardo da Vinci II strand. It brings together archaeologists and engineers from four countries (Norway, Poland, Turkey and UK) to develop learning materials for each others' sector that can be delivered as e-learning CPD (continuing professional development) modules. The learning material is very specifically not intended to make archaeologists into engineers or vice versa, but to provide an opportunity for two sister sectors to learn what we wished they knew! Development and delivery has been achieved through an application developed and hosted by one of the project partners, Adam Mickiewicz University in Poznan, which will allow practitioners to access blended or distance learning in any of the four languages of the project.

Objectives and justification

The general aim of the project is to deepen and broaden professional understanding between two professional sectors, broaden the understanding of professional archaeologists and to help them to recognise the needs and concerns of the construction and civil engineering sector and to help members of the construction engineering industry break through what they can see as the 'professional mystique' of archaeology.

To reach this broad, general aim, the project has a series of specific aims, which are to:

- > Identify interdependent skills requirements between construction engineers and archaeologists;
- > To review current best practice for archaeologists and engineers in each partner state;

- > To identify relevant occupational standards;
- > To prepare best practice guidance material for engineers and archaeologists in all four partner states;
- > To design training materials;
- > To design e-learning delivery mechanisms;
- > To elaborate guidelines necessary for appropriate conversion of traditional training material into e-learning modules; and to
- > Test the e-learning material and mechanisms.

History of the project

This project originated through a contact seminar organised the Turkish national agency for the European Union's Leonardo da Vinci fund, held in Istanbul in June 2005. Delegates from Pamukkale University, ERBİL construction, who are based in Ankara, PSMB (the Polish Association of Building Mangers) and the Polish-British Construction Partnership happened to be sat at the same table as the representative of the Institute for Archaeologists, and together we realised that there might be potential for a joint archaeology-engineering project based around training. A representative of the Adam Mickiewicz University in Poznan was also at the meeting, and we invited him to join us.

Those initial ideas were structured around a previous, unfulfilled project idea that the Institute for Archaeologists had tried to develop for the Aggregates Levy Sustainability Fund in the United Kingdom. That project idea had involved archaeologists and quarry operators discussing and sharing ideas about training for the two sectors, but it rapidly became apparent that something similar could be done much more effectively and usefully for archaeologists and engineers – a far wider constituency of professional contacts. After a quick discussion regarding acronyms, a plan to launch ACES – Archaeology and Construction Engineering Skills – was born. Informal discussions with a representative of the UK Leonardo Agency who was also at the meeting helped to firm up ideas for the project proposal, and after recruitment of two Norwegian partners, the UK-based Construction Industry Research Association and the transnational European Association of Archaeologists, a 'pre-proposal' bid was made to the European Commission in September 2005.

That pre-proposal led to an invitation to submit a full proposal; the EC had provided some feedback, which was taken on board, the partnership changed

slightly and the bid was submitted. Unfortunately, in June 2006, we learned that we had been unsuccessful.

However, while dispirited, the partners were still keen to try again. The European Commission had been positive about the partnership we had built, we felt we had the makings of a good project and so decided to bid again in March 2007 under the 'Transfer of Innovation' heading. This revised, improved bid was successful, and the project received funding for 70% of the total project costs from the European Commission to allow it to run from November 2007 to October 2009.

Project team

The partnership is made up of nine organisations, representing the two participating sectors – engineering and archaeology – across four countries – Norway, Poland, Turkey and the United Kingdom. In addition to these partners, the transnational European Association of Archaeologists, which has its headquarters in Prague, performs a disseminatory role across Europe for the archaeology sector. The partners are led by the Institute for Archaeologists (IFA), which is the professional association for archaeologists based in the United Kingdom. IFA acts as project promoters, and are responsible for the distribution of EC funds to the other partners and for reporting to the UK National Agency which distributes those funds of behalf of the European Union.

In Poland, two organisations which have worked closely together in the past and are based in Warsaw, PSMB (Polskie Stowarzyszenie Menedżerów Budownictwa) – the Polish Association of Building Managers) and PBCP (the Polish-British Construction Partnership) represent the interests of construction engineering, while the Institute of Prehistory of the Adam Mickiewicz University in Poznan provides input from that sector. This partner is also responsible for the development of the online learning materials.

The Norwegian partners are the Riksantikvaren (state heritage agency) and Sintef, a quasi-autonomous non-governmental agency for skills in the construction industry. The Turkish partners are ERBİL Construction Engineering, a private engineering consultancy and Pamukkale University, while in the United Kingdom archaeological and engineering input is provided by Gifford, a multi-disciplinary consultancy which has subcontracted some of the archaeological work to Nexus Heritage, while further archaeological input

comes directly from the Institute for Archaeologists (in addition to IFA's project management role).

The European Association for Archaeologists provides pan-continental valorisation (dissemination and promotion) of results for the archaeological sector; initially, it was hoped that a comparable body could be involved for the construction industry, but this proved not to be the case and so Europe-wide valorisation for the construction sector has been subcontracted out of the partnership.

Challenges in transnational working

Working transnationally has been a challenge; early on it was recognised that communication was always going to be key to a successful project, and we had the advantage that most of the partners had met in Istanbul and several had worked together before on other European or national projects.

The partnership timetabled five meetings of all partners over the two years of the project, reviewing progress and planning future activities at the end of each scheduled stage of activity. We also decided to introduce one additional, special meeting to address the development of the online learning material in particular. These meetings have all been carefully structured, two-day meetings (entirely conducted in English, as the official language of the project), with minutes and lists of action points promptly produced and made available by email and through the project's website.

These partner meeting generally work to a common agenda, and are also structured around highlight reports that each partner has to produce on the work that they have achieved in the previous project stage, identifying any issues that they have regarding budget, timetable or resources and allowing these issues to be discussed collectively.

While these meetings may have occasionally been frustrating, they have in general been extremely productive and the partners have appreciated the opportunity for face-to-face contact. This has also been strengthened (where appropriate) with additional social activities, such as project meals and site visits.

Finance has presented an interesting challenge, with a project budget that has to be tracked entirely in Euro but with half of the project partners being from non-EU states and none of the others being within the Eurozone. Indeed, the partner countries can be presented in a clichéd way as being divided between EU-members who do not use the Euro and whose

populations are not keen to join the Eurozone (the United Kingdom, the Czech Republic), EU-members who do not use the Euro but would like to (Poland), non-EU members who want to become members of the Union (Turkey) and non-EU members who do not want to join the Union at all (Norway).

This has meant that, with partners accumulating expenses in five different currencies, together with project meetings distributed across countries using four of those currencies (and occasional valorisation activities taking place within the Eurozone), tracking expenditure and ensuring the correct conversion rates are used is of critical importance. Expenditure in the opening stages of the project had to be converted to Euro using the official European Central Bank rate on the day that the first tranche of funding was released by the UK National Agency for the Lifelong Learning Programme to the project promoters, and for the closing stages using a different rate that applied when the third tranche was released.

Ensuring that appropriate agreements regarding the partners' intellectual property rights are made has also been crucially important. The partnership has reached a nine-point agreement that prioritises the dissemination of project results, allows whichever partner that has developed a product to retain the rights to that product but ensures that all partners have free use of any such product.

This IPR agreement then allows for commercialisation of the results, an approach that the European Commission values and appreciates (if partners or the partnership can economically benefit from the outcomes of a project, then those outcomes are likely to continue to be used and applied post-project). The partners have thus worked to develop a shared agreement that will allow us to use the results and products of the project – the training material and delivery mechanism – that ensures none of the partners will be financially disadvantaged, nor will they have to compete with each other to deliver these products to any target audiences.

ECOTEC, the UK National Agency for the Leonardo programme, provided feedback on the report that had been submitted on the work of the first 12 months of the project, which recognised and identified strengths and weaknesses of the project's processes to that point (the weaknesses related largely to the delays in trying to recruit a transnational engineering partner). This has helped the partnership focus on overcoming identified problems in order to complete successful delivery of the project's objectives; this has also meant

a request for the project's timetable to be extended by one month was made and accepted by ECOTEC.

Development and application of learning materials

The ultimate learning materials that the project will produce will be e-learning modules for both sectors, available in the four partner languages. In order to produce these, the partners have gone through a process of reviewing best available practice, using this information to produce 'hand-books' of technical advice, and then distilling these into Sharable Content Objects, or SCOs, which form the basis of each individual online learning encounter or experience under the system used, SCORM (Sharable Content Object Reference Module) – v1.2 standard, which can be uploaded into any virtual learning environment.

The partners worked together within each of the two sectors in doing this, with individual partners charged with producing individual SCOs, and then this work was reviewed by the 'other' sector – so archaeologists produced the material that will form the basis of 'archaeology for engineers', which was then reviewed by the engineering partners and vice versa.

Throughout, this was undertaken to the requirements set out by the Adam Mickiewicz University in Poznan e-learning delivery specialists.

Once this syllabus of SCOs was agreed, it could then be transformed into interactive and visually appealing learning materials, and then translated (using support software) into the four partner languages.

Production of learning materials

The learning materials developed by the archaeological partners for use by engineers cover

SCO1	What is Archaeology? Why does it matter?
SCO2	International framework
SCO3	Licensing and Standards
SCO4	Roles and responsibilities of archaeological organisations
SCO5	Stewardship of the historic environment
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SCO6	Types of Sites – non portable
SCO7	Types of Sites – Portable

SCO8	Degrees of importance
SCO9	Types of development – introduction
SCO10	Types of development – Greenfield
SCO11	Types of development – Brownfield
SCO12	Types of development – Bluefield
SCO13	Types of development – Marine
SCO14	Archaeological techniques – introduction
SCO15	Archaeological techniques – non-invasive
SCO16	Archaeological techniques – invasive
SCO17	Archaeological techniques – excavation
SCO18	Archaeological techniques – sampling
SCO19	Post-excavation – Analysis
SCO20	Post-excavation – Publication
SCO21	Post-excavation – Public archaeology
SCO22	Timescale and risk overview
SCO23	Feasibility and design
SCO24	Application stage
SCO25	Enabling works
SCO26	Construction
SCO27	Case Studies
	> Poland
	> Norway
	> Turkey
	> UK

The materials produced by the engineers for archaeologists are deliberately not a direct mirror of the archaeological SCOs, but there are some critical commonalities and some SCOs are shared materials (Health and Safety and Case Studies).

SCO 1	Engineering Course for archaeologists – introduction
SCO 2	Who's who in a construction project?
SCO 3	Procurement routes & Types of contracts
SCO 4	Public clients – contractual / financial issues
SCO 5	Private clients – contractual / financial issues

SCO 6	Engineering Soils
SCO 7	Plant and Equipment
SCO 8	In-ground structures in Rural areas
SCO 9	In ground structures in Urban areas
SCO 10	Health & Safety
SCO 11	Contaminated Land
SCO 12	Stages in the building project – including timescales
SCO 13	Design process
SCO 14	Pre-planning desk top investigations
SCO 15	Geotechnical investigations
SCO 16	Environmental Evaluation
SCO 17	Site investigation techniques
SCO 18	Risk management
SCO 19	Physical Mitigation
SCO 20	Contractual aspects of Mitigation
SCO 21	Pre-excavation ground modelling
SCO 22	Construction: Advanced works
SCO 23	Construction: Concurrent working
SCO 24	Construction: Watching brief
SCO 25	Engineering Works in a Historic Landscape Context
SCO 26	Urban (brown field) – Poland
SCO 27	Best practice Norway-Marine
SCO 28	Turkey – Subterranean

To test the materials, distance training was arranged in each country with identified trainers and volunteer trainees. Training is anticipated to take place over a 1 – 2 week period, with a total of 1 – 1½ hours required by each trainee to complete the distance training.

The project chose to follow the model of facilitated web-based training – e-modules and online trainers only, and while the platform is accessible in Polish and English only, courses will be in all four national languages. Access to the course will be restricted by making it only accessible during a set timetable, which would be determined in advance by each country, and

trainees can log-in from another webpage (such as the ACES site) or directly to the login-page which is situated on the UAMP host site.

'Training Scenario' information is sent to each trainee participant – explaining aims of training and any other required information. This will show what students should know, what they will learn, start/end dates and other details, and trainees are encouraged to communicate with their trainers and fellow trainees through the course online forum only and not by email, to ensure group discussion and to maximise information dissemination.

Post-project application

The project has now developed learning materials and applied them through e-learning methodologies, transferring innovation from the academic sector to the applied archaeological and engineering sectors, opening up new routes for learning for early-career and aspirant professionals.

'Working with partners from a range of European countries, each with their own systems for dealing with the archaeology-construction relationship, has thrown up some interesting challenges, but the sharing of experience and best practice has been very valuable. As a result, the project has not only promoted a better understanding between the archaeology and construction sectors but has also enabled a better understanding between archaeologists and engineers across the partner countries' (Geary 2009).

Further details at www.aces-project.eu

References

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11

The past in the future: e-learning, multimedia and archaeological heritage in the digital age *François Bertemes & Peter F. Biehl*

Abstract

Archaeology and archaeological heritage management are undergoing a revolution, with doing and presenting the practical work and theoretical questions regarding what knowledge is communicated and how the specialist community and the public is engaged in this knowledge production and knowledge transfer. Multimedia technology and the internet have also inaugurated a new chapter in the way archaeology and heritage management is taught. But although the past ten years have witnessed a dramatic increase in archaeological digital projects around the world, we have to acknowledge that there are major shortcomings in transmitting of this knowledge to our students, the specialists and the public alike. E-Learning offers the tools and methodology to remedy this and to help to producing and communicating sustainable archaeological knowledge about our threatened cultural heritage. This paper discusses ways how e-learning and multimedia can help to serve both communities and contribute to a sustainable development of archaeological heritage in Europe in the digital age. As such, it outlines how multimedia can be applied in teaching and practicing archaeology from online-teaching platforms to excavating, analyzing, processing and interpreting the past as well as communicating and popularising archaeology to the public.

Introduction

On the background of the continuing financial crisis and the cuts to public funding it has become pivotal to better 'communicating archaeology' to the public (Biehl 2005: 240; see also Hamilakis 2001: 5). The best way to popularise, popularization as a key strategy to engage with the public via media (Biehl 2005: 244 – 247; Daum 1998: 25; especially Brittain and Clack: 30 – 31),

archaeology is via multimedia. It's easy to learn, inexpensive, efficient, powerful and fast. The best way to start such an endeavour in archaeology is to study the theory and practice how to use multimedia in the classroom as well as in the field. The students have to get acquainted to the process of transporting their acquired knowledge to archaeologists/heritage manager *and* to the public. They have to understand the potentials the new tools provide for popularising archaeology but they also have to be aware of the dangers embedded in these processes.

The use of multimedia in museums and heritage management services is currently taken for granted. Therefore, the procurement of an overall media competence in future archaeologists should already have been achieved during academic studies and ideally already during undergraduate studies.

Multimedia in Archaeology

Multimedia (and hypermedia) are hot topics these days and around the world, archaeologists are increasingly taking advantage of them to enhance their research. This began in 1997 with the influential Special Review Section on 'Electronic Archaeology', edited and introduced by Sarah Champion (*Antiquity* 71, 1997, 1027 – 1076). We can differentiate among six different domains in electronic/digital archaeology or the so-called 'E-Archaeology': First, the World Wide Web itself, second, electronic publishing (journal and monographs), third, electronic communication groups, forums and lists, fourth, electronic archiving (server and cd-roms and dvd's), fifth, e-learning and e-teaching and finally sixth, the application of hyper- and multimedia in archaeology (Biehl 2002: 147). But as much as they like applying new technology, few archaeologists are interested in reading about it. After all, they say, new media really belongs to the world of computer programmers, graphic designers and commercial managers. Archaeologists may use some of its tools, but its relevance to archaeology is minimal and it has nothing 'directly' to do with archaeology. Or does it? In the past decade, we can witness that far from being marginal, technology is rapidly sliding to the center of archaeology (see publications such as Kamermans and Fennema 1996, Altekamp and Tiedemann 1999, Barceló *et al.* 2000, Lock and Brown 2000, Lock 2006, Richards and Robinson 2000, Morrison, Popham and Wikander 2000, etc.). New media is revolutionizing both practice and theory as well as methods of engagement, publicity and media relationships in archaeology. With its speed and simplicity of explanation, new media can

– in fact, has already begun to – alter the way we as specialists view our work (Myrup Kristensen 2007: 73). It has also shifted the way the public regards archaeology (Biehl and Gramsch 2001, 271 – 273).

The terms *multimedia* (and *hypermedia*) and *new media* emerged in computer science circles in the 1980s (For an excellent introduction to the subject and stringent definitions see Steinmetz 2000, especially 695 – 742). Multimedia refers to the integration of graphics, sound, video, and animation into documents or files. The files are then linked in an associative system of information storage and retrieval. It is especially through hypermedia that the archaeologist can engage with the public and students in a much more powerful way: files contain cross-references called hyperlinks that connect to other files with related information. In a way, you can consider them very smart footnotes that lead you through an endless maze of information. By using hyperlinks, users can move – or as the computer scientists say – 'navigate' from one document to another through these associations. Hypermedia is structured around the idea of offering a working and learning environment that parallels human thinking – that is, an environment that allows the user to make associations between topics rather than move sequentially from one to the next, as in an alphabetical list. Hypermedia topics are thus linked in a manner that allows the user to jump from subject to related subject in searching for information. If the information is primarily in text form, the document or file is called hypertext. If graphics, video, music, animation, or other elements are included, the document is called a hypermedia document. The potential of this new media was quickly understood and seized by businessmen, media outlets and academics. In the humanities, George Landow and Theodor Nelson have done some of the most extraordinary and pioneering work (Landow 1992, 1997, Nelson 1981, 1987).

Archaeologists, too, have responded and every year, more multimedia tools are being used in our publications, documentation and communication with colleagues. The transition is remarkable and is allowing us to collect, process, store and disseminate archaeological data with never-before-achieved speed, facility and accuracy (Biehl 2002: 148).

But more than technical wizardry, new media offers stunning epistemological and theoretical potential for archaeologists and their engagement with the public and students. Since hyperlinks work with the same sort of roving associations made by the human mind, using hyperlinks actually facilitates learning and understanding (Keil-Slawik 1997, Fritsch 1998, Wydra 1999).

They move with the user, instead of forcing him/her to follow a preordained pattern. They also transform the static into the dynamic. For instance, instead of seeing a drawing of a plan of a house with cooking pots, tools and rubbish strewn about, a student could be shown a whole environment, complete with sound and movement. If a student is interested in learning more about the pots, s/he could just click on them on an e-learning platform to get more information. Or, if s/he wants to know what the rubbish is, s/he could be presented with a variety of possible theories, some of which may be contradictory. The paths are not only multiple, they are interrelated. When looking at a text, the user – who could be an archaeologist, a student or simply a curious reader – does not have to read everything from start to finish. S/he can follow her/him own interests and even participate in the interpretation of a site, monument or object.

Communicating Archaeology

But what else can multimedia do to better communicate archaeology? Let's start with the way archaeology is published. Martin Carver has recently laid out how 'open access' will dramatically change the way archaeology will be published and communicated in the near future (see Carver 2007). But still, the vast majority of archaeological texts is published 'traditionally' in paper form in journals or books and count on passive readers. The author has the sole voice and the texts usually do not incite the reader to think about new ways of reading or thinking about archaeological data. In hypertext, on the other hand, the reader is forced to make choices and decisions and to become implicated in the construction of an account or interpretation of textual and visual material. In 'hypertext archaeology' the reader can click and move out of a text and search for references within a global network of information. The widespread availability and low cost of digital information flow also allows us to disseminate and communicate easily across international borders.

Since they shift points of entry and viewpoints, new information technologies raise significant problems of authorship and control (Carver 2007: 140 – 141). Archaeological site reports have increasingly become collaborative, and new technology allows a radical extension of this process. Placed on the web or in some interactive hypertext environment, a site report can be continually commented upon and its original integrity can be enhanced. It can also be lost. As the autonomy and fixed nature of the text disintegrate, the

author has less mastery and control over the message, some even speak of 'the death of the author' (Hodder 1999).

In the end, there can be as many understandings and interpretations of a text and data as there are users/readers and writers. Applied to the web site of famous excavation sites such as Çatalhöyük or Troy (www.catalhoyuk.com, www.troia.de), this could open up completely new trajectories for doing archaeological research as well as engaging with the public. For instance, we could link databases, house plans and stratigraphies and the material culture found in them with re-constructions or with personalized diaries of the excavators. This would not only bring a new dimension to learning via e-learning about the find, but would also provide a solid record of how data was collected and teamwork experienced. The data of the excavation report could also be linked to an interactive bibliography, where one could get current as well as past research studies on the site and any related ones. The bibliography and the report could be linked on the e-learning platform to a virtual reality reconstruction of the site. That site could then be hyperlinked to texts relevant to the discussion that appear in scientific journals and the press. Even a technology-skeptic must admit this would be a profound accomplishment and teaching/learning tool as well as a completely new way to popularize archaeology.

In summary, archaeological publications based on hypermedia, such as e-books, e-journals, website publishing and books with multimedia cd-roms or dvd's promote and facilitate *multivocality* and can easily integrated in an e-learning platform. Like hypertext and hypermedia, multivocality functions on the premise that fragments can be linked in such a way to form a comprehensive whole. As such, it emphasizes the past as dialogue rather than monologue. Many voices share in the conversation, rather than one unified 'us' voice. Hypermedia technologies are, therefore, better suited than linear publications for engaging with the public and to better communicate with other archaeologists in analyzing and interpreting archaeological data. The same is true in the knowledge transfer to archaeology students via e-learning platforms.

How archaeology is presented to the students as well as the public can also be enhanced and improved by hypermedia in a variety of ways, including virtual reality demonstrations and the use of narrative. It took a lot of years of struggle, but archaeologists today have grown accustomed to thinking of the past as something not wholly real. We now accept that the past is at least

partly defined by how we reconstruct it and is therefore artificial and ‘virtual’. This is true of all elements, from our data catalogues to our site reports to modern research topics involving landscape. New technology allows us to produce digital information for which we can easily change the font, size of letters or lay-out to enhance or emphasize our point – or merely to study specific data more efficiently. What we then create is a virtual representation, not the real artifact, monument or landscape. We have also shifted our focus from specific ‘monuments’ such as graves, settlements or hoards, to looking carefully at how monuments and landscapes were perceived by the people using them (Biehl and Gramsch 2002, 121 – 123). By employing ‘virtual/digital archaeology’ we can re-construct these monuments and landscapes and better study them as a whole (Barceló, Forte and Sanders 2000).

In addition to creating a more visual vision of the past through virtual re-constructions, we have also begun to make the past livelier by introducing narratives about peoples and individuals. This is a hot topic, but many archaeologists regard this practice with skepticism, believing it moves too close to the realm of fiction. Certainly, the technique is useful, but to date, we have not found a way of convincingly embedding it in our work. Narratives can be dangerous when they attempt to provide sweeping stories about large migrations of prehistoric peoples. They are at their most useful, however, when they are applied to the ‘lives’ of individuals, as Ruth Tringham does in her hypertext account of Opovo (Tringham 2007).

Although it is fragmented, hypertext is grounded in linearity. There is almost always a ‘menu’ to which the user can continually return, and there are buttons directing a user to ‘click here’ or ‘start here’. And, although the user can choose what direction s/he goes, s/he certainly follows some sort of path through the hypertext environment. In this way, the past is experienced as a network or a map, rather than a one-dimensional road (see also Holtorf 2000, <http://citdpress.utoronto.ca/holtorf/index.html>).

Hypermedia also fills another gap in recent theoretical discussion – the profound need for more ‘critique’. A user can read a text side by side with critiques of the text simply by pressing a button. Or, a user can call up a text along with the data supporting it, or compare reports of stratigraphical relationships to field photographs or videos. Clearly, this adds dimension (‘reflexivity’) and depth to our ability to scrutinize each other and ourselves. One of the biggest problems in easing multimedia into archaeology has less to do with the medium than the users, as has been pointed out. In the article

‘Cyberspace/Cyberpast/Cybernation: Constructing Hellenism in Hyperreality’, Yannis Hamilakis says ‘the representation of archaeological production on the Internet is a phenomenon which has barely been touched upon. To date, most archaeological discussion seems to treat the Internet simply as a technological device’ (Hamilakis 2000: 257). He adds, ‘the links between antiquity/archaeology and cyberspace is a topic which has not been explored in any systematic way. Yet the issue has important implications for the nature of the archaeological process in the present and the notion of archaeological authorship, as well as for the construction of archaeological knowledges’ (Hamilakis 2000: 243). Clearly, we need to work harder at integrating technology into our thought-processes and work styles and powerful databases are here the key.

‘In years to come, communication in archaeology is going to take a number of new forms – some predicted, some that we cannot yet know’ (Harding 2007: 130). Harding is also right when he predicts that ‘the public’s appetite for archaeology is not going to die out’ but also that ‘we have the duty to make sure that it is fed with interesting stories that remain authoritative... There are always going to be discoveries to fascinate and inspire; our task is to make sure they are treated professionally in every respect, from unearthing, through post-excavation study, to publication – and dissemination to both specialist and non-specialist audiences’ (Harding 2007: 130). This module tried to demonstrate that training in the methods of engagement and media relationships are crucial to achieve this goal and in fact easy to undertake with multimedia technologies.

Knowledge Production

Our assertion is that knowledge is a practice; it is knowing how to adjust to a specific social-material setting (Smith 1996; Brown and Duguid 2000). Knowledge is also performance: it is embodied in practice, not something we have, nor even something we can name consistently, but something we do (Boast and Biehl in press). Moreover, a necessary condition for the generation of knowledge is engagement with other agents, other people and other things. However, engagement involves more than perception and cognition. It involves purposiveness and interpretation – intentionality. Traditionally, the performance of archaeological knowledge tends to use two modes of representation, the interpretative and the classificatory, and there is a conflict

between these two approaches. The systematic classificatory approach denies, fundamentally, the role of an object as citation. It gives fundamental primacy to the definitive account upon which all other secondary accounts are placed. While the interpretive engages with the classificatory only as a mode of access to objects as illustrations. While archaeology has become increasingly open to grassroots access and the ability of social computing to provide for greater audience participation, an important step of re-considering object citation and representation still has yet to be fully taken.

Representation must involve a consideration of the diverse ontological frameworks associated with different expert communities who have an informed experience and interaction with the object. Archaeologists, heritage managers, cultural preservationists, curators, and, critically, the local and regional public must all interact around the object, and influence its selection, acquisition, classification, and presentation. This allows for online information systems to perform as 'contact zones', spaces which foster incommensurability and dialogues that emerge from the different traditions within which the object has traveled (Pratt 1992; Clifford 1997).

Artifacts and sites, as pieces of tangible cultural heritage, are gateways to a number of intangible, yet critically connected, practices: the telling of a story, a prayer, a song, a fairy tale, the process of research, the history of the exhibition, the relation to other objects, and so on. Therefore, we wish to re-expose these intangible processes around the object, through the consideration of 'multiple ontologies'. We find this goal for the module particularly pertinent and possible in the context of digital spaces and the possibilities of Web 2.0 create new models for re-thinking representation.

Archaeological practice has been experiencing many changes over the past three decades, not least in the reorientation of recording and interpretation from a singular and authoritative account to multiple conflicting accounts (Boast and Biehl in press). However, no matter how much has been argued for a pluralistic approach to interpretation and presentation, the intellectual control over the informational core of the recording, its catalogue of objects and relations, has largely remained in the hands of the elite experts. The maintenance of the archaeologist as academic gatekeeper has been replaced by the archaeologist as educational gatekeeper. This change is clearly represented in the dichotomy between the diversity of archaeological performances in on site and off (talks, guides, school tours, and exhibitions) and the actual record. While the archaeology allows many voices to be expressed from

different experts, authorities and even the public, rarely do these voices pass beyond a local and temporary performance, and rarely are they recorded in an enduring way in the site record or monument description. Despite the numerous recent technological innovations, which encourage contributions from a wide variety of distributed groups of users, traditional archaeological recording practices persist, with narrowly descriptive structures written by a small, select group of 'expert' contributors.

Visual Representation

Virtual representation for producing and communicating archaeological knowledge has become increasingly important in the field of archaeology and heritage management in the past few decades. But it is a given fact that there are great potentials and serious dangers when using multimedia technologies such as virtual reconstructions, 3D-animations etc. to popularize archaeology (Biehl 2005; Biehl, Bertemes and Northe in press), and we will discuss two case studies to illustrate this. Visual representations reproduce knowledge whether by reproducing likenesses of objects, places or people. Recorded data, organized in a more communicable form (i.e. visualization) or by reproducing the various interpretations of archaeologists and heritage managers. Van Dyke stresses that '...visual representations are integral to the production of knowledge and scholarly authority' (Van Dyke 2006). Visual representations are often used by archaeologists and heritage managers to not only communicate information to one another, but to also make their interpretations available to the public. In recent years one way this is being done through outreach programs using digital media. It's true that computers have been used by archaeologists for a long time (see Boast 2002), highly sophisticated and fast computer graphics have been available to archaeologists only in the past two decades. The 1980s marked the beginning of its use starting with the digital production of site plans, illustrations of artifacts and the results of the analysis of archaeological data. Computer graphics are a valuable tool allowing for the representation and manipulation of large amounts of complex data and has been labeled 'virtual archaeology' (Lehtonen 2005; Virtual archaeology applications 2008, Virtual archaeological methods 2008) and includes everything from reconstructions of sites and artifacts that can be created graphically from this amassed data to virtual reality reconstructions and 3D animations. Virtual (or digital) archaeology is a powerful tool in visualizing and understanding archaeological data as well as

producing and communicating it to the public (Evans and Daly 2006: 253). It is also an educational source for the general public and students in archaeology and heritage management. Many re-creations from greatly detailed archaeological sites have been created with standard modeling, rendering, and animation techniques. Digital archaeology allows for increased rates of publication of archaeological materials through the use of the internet. Its 'open-source-knowledge' allows to quickly and at low cost (or cost-free) to produce and communicate archaeological knowledge to an international specialist community, schools and the interested public alike and even get them interactively involved in this process.

Since funding is increasingly limited for both universities and heritage management, the internet becomes more and more pivotal for communicating archaeology (Biehl 2005). It is therefore necessary to produce and perform archaeological knowledge efficiently with multimedia applications so that it can be easily accessed by the public – one of the greatest resources for archaeology. Tourism is one of the world's most powerful revenue source. Visits to archaeological sites are often greatly educational. Unfortunately, the nature of tourism is at the same time economically beneficial to not only the funding of archaeology and heritage management and the local economy, but sometimes also threatens the archaeological remains (Renfrew and Bahn 2008, 545 – 74).

One way to outreach to the public to keep its interest as well as preserve the fragile nature of many archaeological remains is through digital archaeology and the internet. The internet has greatly expanded communication networks and the distribution of educational materials. The rate at which archaeological information is available on the internet is ever-increasing. Site reports, virtual museums, digital reconstructions, and ideas are available almost instantaneously. Some even argue that the internet is increasingly becoming the most important way to publish archaeological sites because of the wide distribution of knowledge and frequency and ease of updates and new editions. The open-source quality of the archaeological knowledge on the internet provides the possibility to interactively modify, improve and redistribute the knowledge. 'The speed, range, and low cost of the internet have created new possibilities for dissemination and participation in knowledge construction and acquisition' (Hodder 1997). It allows for the opportunity of access to raw data and the ability to form one's own conclusions about archaeological materials. This has been seen as a move from hierarchical

structure of interpretation to a more networked or multivocal approach.

These innovations bring with them the great potentials described above as well as serious dangers. Unfortunately, many online publications and site data are restricted in some form or another. Articles may require subscriptions to their online publications. Many of the journals that are only online are relatively small and not well-known, and well known journals of the same type, offered in print and digitally, may offer almost no free information.

Though it is a powerful tool for visualization, understanding, and communicating to the public, visual representations are biased, they encourage one particular interpretation over another (Van Dyke 2006). Levy points out that 'it is impossible to decide objectively between 'good' and 'bad' uses of the past; furthermore, there has been so much human movement, cultural mixing, and culture change in Europe that continuity from the past is a fiction' (Levy 2006). And there is a final danger with digital archaeology: its Eurocentric perspective. Not all countries offer speedy broadband connections to their universities, museums or heritage management services, not to speak from school or private households.

However, we would like to discuss briefly one case study in order to illustrate 'public outreach in the digital age' and to also discuss how archaeological knowledge is produced and communicated about online-museum collections.

Case Study Multimedia Applications at Çatalhöyük – Digital Places

An important and influential website is that of Çatalhöyük, Turkey; a significant Neolithic site discovered in 1958 in Central Anatolia and excavated 1959 – 1963 by James Mellaart and continued by Ian Hodder from 1992 (see www.catalhoyuk.com). The website features archive reports, databases, site management plans, illustrations, reconstructions, photographs, video documentations etc. This allows for analysis of the archaeological materials interested parties. The video documentation not only tracks the excavation processes but also the views of the excavators. These videos are put on the website to assure some sort of multi-vocality and have proven to be a good means to popularise the site and its archaeology on the one hand and to make it create a better understanding of it in the public on the other hand (Biehl/Gramsch 2002). Also included are lists of researchers and excavators, contact information, visitor instructions, forums and blogs to encourage open communication networks.

Çatalhöyük is a good example of the methodological turn virtual archaeology offers for producing and communicating archaeological knowledge. The application of multimedia equipment such as video recording (Brill 2000, Stevanovic 2000, Wolle and Tringham 2000) enable a reflexive and fluid methodology at a large-scale excavation project and promote a reflexive, pluralistic and 'open' access to archaeological knowledge, and can disentangle 'the dichotomies between past and present, theory and method, interpreter and interpreted, subject and object, specialist and public, which are so troubling today' (Biehl 2002: 151). The latest trends in public outreach can also be studied at the Çatalhöyük project.

These cutting-edge and innovative projects are directed by Ruth Tringham and reach from 'remixing' (<http://okapi.dreamhosters.com/remixing/main-page.html>) to 'remediating' (see remediated places project: 'Senses of Places, the digital mediation of Cultural Heritage' <http://chimeraspider.wordpress.com/>) and 'Second Life' (<http://slurl.com/secondlife/Okapi/128/128/o>).

Still, documentation is one of the most important aspects of archaeology, including the listing of artifacts, mapping locations of sites, and positions and contexts of the artifacts within the strata. In order to create a detailed representation of an archaeological site or artifact, detailed measurements, observations, and collections of data need to be accumulated (Lehtonen 2005). The Total Station increases the speed at which finds and features can be recorded allowing for a much greater number of finds to be recorded in a smaller amount of time. This speed increases the accuracy and thoroughness of excavations.

Archaeology often depends on archival data obtained by other archaeologists, or researchers in other fields. This can cause differences in the way things are documented including measurements units and language of data. Often databases are selective, and even when they are assessable, they may differ in size, format, or structure. Databases that have been compiled separately and are controlled by museums, government agencies as well as individuals and universities may have been created on different computer platforms (Snow *et al.* 2006). There is a voluminous of unpublished literature consisting of limited distribution reports and so-called grey literature that has been mainly produced commercial excavation firms and government agencies. As well as images, maps, and photographs embedded in museum catalogues and archaeological reports both published and unpublished.

Protocols are needed because of the confusion caused by modern political boundaries nevertheless irrelevant when talking about prehistoric, early historic or environmental contexts.

With the advancement of computer technology, virtual reality renderings have brought data to life. The Minnesota State University's E-Museum describes VRML or Virtual Reality Modeling Language, as allowing archaeologists to convert 2D digital elevation models of sites using GIS data into 3D 'full color, photorealistic models that can be interactively explored' (Virtual archaeological methods 2008). 'GIS is a computer based set of procedures for storing, manipulating, analyzing, creating, and displaying spatially referenced data' (Davis 2005). Modeling allows for easily viewed and distinguishable stratigraphic layers and the relationships of those objects found within the strata (Uehara *et al.* 2001).

Virtual excavations use a computer tablet along with a GPS unit. It allows visitors to the site to see what the site would have looked like in the past, connecting far greater on a level of understanding a site with barely any visible signs of the past human presence. People can see a site in its original state, they can change their perspective, view the site without degradation by natural or human processes, and it can be viewed by a much larger number of people through the use of the internet (Uehara *et al.* 2001).

Computer programs aid in artifact assemblage by 'finding adjoining pieces in a large collection of irregular fragments by comparing their shapes' (Da Gama Leitao 2001).

Documentaries are also very important tools utilized in communicating archaeology to the public. They can be viewed on tv as well as through the internet (Van Dyke 2006). 'As an excavation progresses, the archaeologist never sees more than a single reference frame. As portions of a site are uncovered, they are recorded as data and a new reference frame is revealed while the first is forever destroyed by virtue of the second being revealed. By modeling the data, both artifacts and the matrix of associated soils, rocks, floral, faunal and other documented finds, the researcher can essentially paint a motion picture of the excavation' and the past (Applications 2008).

Conclusions – Contextualizing Knowledge Production and Communication

At the end of this paper we present not so much a conclusion or summary as a postscript. The case study raises several issues that have always been there,

but have been largely neglected. The need for information in narrative form and the power of diverse contextualization of 'digital places' (excavation projects) and 'digital objects'. This suggests two major stages of access:

The first stage is the importance of understanding how to present digital places and objects to multiple publics. Though this is not a study of semantics, semantics are not, in themselves, a useful way forward for public outreach of archaeological knowledge. Semantics, and the Semantic Web, start from the assumption that syntax is the bridge between ontology and epistemology. The module presented here suggests that understanding requires a consensus and participation from those using the information. That the relevance of the digital places and objects arises not from the semantic designation of the place or object, nor from its role as an illustration of some definitive story, but from a context of use. That the context of these rich representations must be made apparent, and that through this dialog with diverse images, accounts, and descriptions, others can begin to construct a meaningful understanding of these objects, sites and practices. It is also through the process of meaningful use that others can begin to expand these understandings.

The usual response to this need has been to create interfaces to the information. Much of Web 2.0 operates on this assumption, with some real success. Provide users with a platform for interaction and use, and leave them to do it. However, this ignores the problem of context. Web 2.0 offers a space for exploring the power of appropriation and re-use of digital places and objects, but this must be extended to consider the ability to contextualize and engage local and vernacular accounts of digital places and objects from diverse communities. Future research shall continue to probe these critical issues and enable digital performance to serve as environments that support the generation, representation and transfer of archaeological knowledge in, by, and for diverse communities.

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