Methodology for vocational education and training

in the domain of integrated archaeological and natural heritage

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PART I – METHODOLOGY

Introduction

This document is the result of the Erasmus Plus Vocational Training project ANHER - Innovative format of education and training of the integrated archaeological and natural heritage, carried out between 2015 and 2017 in 6 EU countries (PL, NL, UK, ES, PT, IT).

It is divided into two parts: methodology and guidelines. The methodology regards the use of materials and resources that we have produced within the project. The guidelines intend to guide on the flexible use of training tools and infrastructures that the project made available.

The document targets organizations that may want to create different training tools and infrastructures in another domain or that may want to use the same resources – modes of training.

The choice of didactic methodology has been conditioned by the initial analysis of learning needs as well as of the specific characteristics required by the reference target. The diversity of teaching contexts during training has demonstrated, heterogeneous needs, potentialities and criticalities, which would need to be addressed in order to develop an effective adaptive training model. In addition to the analysis that was carried out, these findings highlight the need to further explore the profiles of the recipients of the trainings. In particular, ANHER's experience (aimed at adult practitioners and trainees) has highlighted the need to consider three different didactic aspects, which must be analyzed according to the specific characteristics of each target group:

1. Recognition and application of the "learning style theories" (Dunn, Dunn & Freeley 1984; Felder & Silverman 1988; James & Blank 1993) in the elaboration of national didactic modules. The model recognizes the uniqueness of the learning process for each individual (or for each learning group of individuals with similar characteristics).

2. Analysis of the scientific context of reference and preparation of supplementary tools to ensure the effectiveness of the teaching content delivery. Each national cultural framework is characterized by specific pedagogical standards and didactic methodologies, and differs in the training habits as well as in learning attitudes.

3. Recognition and application of the "adaptive hypermedia theory" (Brusilovski 1996), thanks to the opportunities connected with the content repository model, states that the ability of web-based training and learning systems to adapt to learners' needs allows for a huge improvement in the effectiveness of training

systems. The use of a web platform guarantees - among other things - an adaptable modularity of content, interactivity (synchronous or asynchronous) and autonomy in managing the learning times. The learners are provided with all the tools they need to shape the learning experience on their specific needs, while pursuing a consistent didactic pathway. Content repository, used as a logical architecture in the construction of the educational path, allows scientific supervision to guide the direction of the training proposal, while giving the trainees the freedom to use tools that can be adapted to specific learning needs.

The analysis of trainees' surveys has also highlighted the need to consider cultural frameworks that differentiate the learning approach (Hofstede & Hofstede 2005). Particularly, the interaction between trainees has attributed significant value to the overall quality of the teaching offer. Italian and Portuguese partners found a very favourable response to the organization of a meeting in person. Spanish and Polish partners have recognized the centrality of virtual interaction between trainees, which has allowed for the creation of special training communities. Despite the professional profile of trainees, the Netherlands and Spain have received critical feedback from the trainees, which demonstrated difficulties in the full understanding of content due to the overly technical approach applied by the authors. As evidenced by surveys and data analysis, each cultural system has different characteristics, even in the approach to learning and training. Each national didactic framework has different study methodologies and heterogeneous research scenarios, which make the production of scientific content for training a challenging process. Nevertheless, the use of a virtual training scenario gives trainees the opportunity to contribute to the creation of a community of inquiry (Garrison & Vaughan 2008), and to enhance a continuous process of critical analysis.

Identification of potential target groups

In order to identify potential target groups, it is recommended to:

o Carry out preliminary contacts with potential targets working in the fields of interest on a national level (i.e. archaeological and natural heritage and their integration). Surveys may be administered in the sectors of interest, asking respondents about their respective fields of expertise and their specific sector training experiences. In the preliminary phase it is advisable to get a wide sample of selected users.

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- o Develop a mapping and analysis of existing training sector offers to contextualize the new training initiative. By training sector we mean the sector of education acknowledged by the Erasmus Plus Programme: Vocational Training, Higher Education, School, Adult, Youth.

The identification of target groups is needed because research fields are very wide, while possible training courses usually focus on more specific themes.

Recognition of needs and expectations of the target group

After having identified potential target groups in all the domains of interest, their respective fields of expertise and their specific sector training experiences contextualized within the wider national framework of existing sector training, a deeper analysis into the training needs and expectations of the target groups may be carried out. This would also allow us to identify which categories of respondents are more concerned about the training topic and keener on participating in a new training initiative. It is also possible to detect preferences on the training modes (e-learning vs other modes) for each specific sector.

Suggested ways to identify training needs and expectations of the target groups include:

- o Analysis of Good Practices from existing courses within the reference training sector in the specific fields of interest should be implemented through a common template. Such analysis should be able to provide an overview on what has been done in each participating country that relate to the training needs and issues. A shared definition of the category of courses to be considered is needed.
- o Reviewing publications within the reference training sector in the specific fields of interest. The aim is to gain an overview on what has been published in each participating country in the domains of interest. A shared definition of the type of publications to be collected is needed.
- o Analysis of the legislation and administrative regulations in the specific fields of interest as a point of departure for defining comprehensive training materials.
- o If needed – focus on lexical nuances and concepts used in each country in relation to the lexicon used in the field of interest and comparative analysis with other countries.

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o   In-depth surveys and interviews to be submitted to a smaller number of identified targets to better identify competences, needs and expectations regarding sector training in the domain of interest.

The potential need of producing new training materials and/or offering them through new training modes could emerge from the same preliminary surveys. Training needs analysis, so expectations could inform the training to ensure a proper impact.

Selection of the most efficient mode of training

This activity would involve a comprehensive analysis of the most commonly used models of content delivery in the reference training sector and the specific field of interest assessing their relevance. In the Vocational Training sector, the main training modes could be:

o   Blended learning – defined as the combination of a number of pedagogic approaches in an e-learning environment, with the possibility to have interaction between teachers and students.

o   Synchronous distance learning – the synchronous method is an e-learning method in which the learning process occurs at the same time. This kind of e-learning method is characterized by two aspects: (i) it is independent of the place and (ii) it is temporally dependent. It comprises a concrete way of interacting with the group such as video conferencing and chat.

o   Asynchronous distance learning – a student-centred teaching method where participants in the didactic process (teachers and students) do not need to be in the same place at the same time. As a matter of fact, the sources of knowledge are didactic materials delivered to the trainees in an electronic format or multimedia learning resources stored online that can be explored and experienced at the learner's own speed. These asynchronous forms of communication are sometimes supplemented with synchronous components.

o   Open schedule online courses – it is offered through an e-learning platform and can mix different modes of training by tracking users' activities and support tutoring for learners. Training sessions follow a set schedule, which include interaction moments and may foresee certifications.

o   Open access to didactic materials on a website or an e-learning platform – self-paced learning from didactic material available online on a website or platform. The course usually doesn't foresee tracking of users' activities or support (tutoring for learners and certifications).

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Production of the course from didactic materials in the E-Archaeology Content Repository

A repository of e-learning content is required in order to provide e-learning training. A repository that can be built with different technical infrastructures allows for an organized collection of data which can be used to store, process and download didactic content in a digital format that can best suit the habits and skills of the users.

A Content Repository tool is software which is intended for the creation of e-learning content repositories. It enables the creation of repositories across a wide range of subjects and allows for the storage and management of e-learning content in SCORM (version 1.2 and 2004) and the creation of new content structures when needed.

A basic function of the Content Repository is to create new e-learning components using components already stored in the repository. The system enables an approach that is analogous to an editorial process, in which an editor - while authoring new material -selects components from the interesting and relevant content stored in the repository. In the Content Repository, this activity consists of finding materials that were uploaded earlier in the repository and were annotated as reusable in many educational contexts. The annotation is then carried out in the process of creating Basic Processable Units from the content components isolated from the uploaded SCORM packages. When creating structures, which is labelled as System Processable Units, these Basic Processable Units and other System Processable Units can be mixed and incorporated into newly created content components.

Thanks to the Content Repository functionality, it is possible to download stored content and build new e–learning material.

The building of a course can therefore emerge from the didactic materials stored in the Content Repository. Within the ANHER project, partners used the E-archaeology Content Repository (www.e-archaeology.org/contentrepository) and five National Content Repositories. E-archaeology Content Repository (central repository) is maintained by Adam Mickiewicz University in Poznań and it contains around 100 modules in 9 languages about archaeological and natural heritage protection and management. National Content Repository versions were based on 8 content Modules (SCORM packages) developed in cooperation with the consortium in national languages and English. Each Module is composed of several Units and Case

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Studies with a total of 100 elements for each national language. From the Content Repository, it was possible to select single Units and/or Modules and build personalized curricula that met the needs of different target groups for different national contexts.

Courses stored in the E Archaeology Content Repository can be downloaded as SCORM packages and offered through various platforms (i.e. Blackboard, Moodle, LearnPress, etc.) that each interested organization needs to set-up.

Announcing the course through both the main Heritage Educational Portal and the national HEP

An appropriate selection of the most efficient mode of training, training infrastructure and tools can serve as a guide for creating a stable training structure that can be managed by delivery partners.

Within the ANHER project, Centres of Integrated Heritage Teaching Excellence were set-up as the online Heritage Educational Portal (available in English and national languages) and were linked to the e-learning delivery platforms. In this way, all partners could advertise and provide access to courses and didactic materials in the domain of archaeological and natural heritage, as well as advertise other sector training initiatives managed by the same partner organizations. The HEP serves mainly to announce courses, indicating course details in national languages (description, prerequisites, training modes, targets, dates/times of delivery, difficulty level, authors) together with information on the delivery partner and its trainers and practical indications on how to enrol in training.

Such training structures shall be integrated with other training activities taking part in each of these institutions. They will also be integrated with the reference sector training systems in the fields of interest in each participating country and should supplement training offers of the existing institutions.

The HEP platform, together with the E-Archaeology Content Repository, may also be accessed and used by external organizations to produce new courses.

As a matter of fact, ANHER project partners agreed to mutually pursue partnerships with other parties to share and expand our knowledge and pursue research as well as develop and deploy projects with multiple universities and communities. Future projects may require subsequent agreements between the parties and may be subject to partnership approval (cfr. dedicated Memorandum of Understanding signed by the consortium that sets the relationship between the national HEPs and the main Heritage Educational Portal, and use of E-Archaeology Content Repository

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as a result of their cooperation in the ANHER project and possible enlargement in the use of such tools).

Implementation of the training

Once the courses are built into new SCORM packages with selected resources from the E-Archaeology Content Repository and once the most efficient mode of training vis-à-vis target groups are chosen, courses can be delivered through various e-learning solutions. Delivery partners may decide to use their existing e-learning platforms, such as Moodle (i.e. in the case of universities – vocational training centres that usually provide e-learning) or new e-learning platforms that are set-up on purpose.

According to the mode of training that is chosen, such platforms are supposed to have different functionalities that may allow a different level of interaction – asynchronous learning, self-assessment exercises, interaction via fora or Skype, synchronous learning – and can be integrated by direct interaction and meetings in person.

It is also advisable to prepare a syllabus and guidelines for platforms and training scenarios that describe and guide the training. The syllabus will provide indications of the full course materials. Guidelines for the specific platform chosen should facilitate users to get acquainted with the IT characteristics of the tool, how to use it and ease into it. The training scenario should describe: training objectives, requirements (IT skills and technical knowledge), course organization and schedule, indication of didactic materials and bibliography, rules for participation, rules for course completion and award of certificates. In addition, the tutor may have a key role as the reference person for the overall course management and be the first point of contact for students.

The training assessment and certifications

As highlighted in the report, one of the more critical problems associated with the creation of training courses was the identification of the proper balance between didactic effectiveness (linked to both the semiotic structure and the innovative nature of the content repository) and the scientific quality of the content. Given the heterogeneity of the target groups, the ability to adapt teaching modules and recombine them according to the specific learning needs is a key element of the model. However, the adaptable nature of the content is not

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sufficient to ensure the internal coherence of the didactic proposal, and the completeness of the information system.

The modular structure of teaching units requires an editorial coordination action that guarantees the autonomy of individual sections, while favouring the interdependence between the various parts of the modules. Since the courses are conceived for professional training, the connection between the didactic proposal and the applicability of content must be the guideline for the production of content. By adopting the model of Bloom's taxonomy (Bloom 1956) we can imagine the path required by acquiring knowledge to be able to translate them into skills, and to adapt the didactic production to the constructivist learning theory (Hein 1991).

The complexity of the teaching-learning scenario, which acquires from the IT tool both advantages (adaptability, replicability of lessons, content modability) and disadvantages (asynchronous interaction, lack of a learning community, lack of a relationship with the tutor), requires a balance and homogeneity between curriculum, training and assessment (Achtenhagen 2012). The ability to modify and integrate content dynamically allows trainers to perfect the didactic model consistently and create a virtuous circle between the definition of a syllabus, the delivery of training activities, and the analysis of results, favouring a viable reusability of the content (Marciniak 2014). It is therefore impossible to separate the positive function of the content repository from a serious and constant reflection on the quality of the curriculum, and on the interaction - directly or indirectly - with the trainees, to encourage constant monitoring of the impact of the didactic activity.

Recognition of achievements may take different forms and have different types of recognition. As far as training completion is concerned, it is very important to fix requirements and prerequisites in advance.

Some of the suggested requirements that may be set by delivery partners for successful completion include:

o Attendance of the online lessons relating to the chosen course, which is to say reading the provided material.

o Regular participation along with contributions and quality ideas on the discussion forum which receive a positive evaluation from the teacher. Guarantee the presence for at least some of the sessions of chat fora or collective Skype meetings. A chat usually keeps track of the discussion and holds a more structured discussion than joint Skype calls.

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o Handing in the reflection essays or collective debate on the chat forum or on Skype (on prearranged conditions and times)or participating in group work as per the set conditions.

If possible, it is advisable to enter into a more precise assessment of knowledge and skills increase, for example, through the administration of questionnaires to participants.

E-learning platforms can host exercises to be used for self-assessment or by teachers for overall assessment.

It is recommended to look for acknowledgement of the training offered. If the delivery partner is not a registered VET provider in their country, it is advisable to look for acknowledgment of the courses offered by professional orders. In any case, a certificate may be issued by the delivery organization or by a consortium involved in providing the training.

PART II – GUIDELINES

Quick step-by-step guidelines on how to use the E-Archaeology Content Repository

The E-archaeology Content Repository can be used to customize content materials. The use of SCORM as a technical framework and the division of content stored in the repository into learning objects allows the manipulation of content components and the creation of larger structures from smaller parts. Such reusable chunks of materials are designed by the author to be used in various (numerous) educational contexts, different from the training programme where they were preliminarily located. Such training components are identified in the content repository as Processable Units (PU). While creating Processable Units, the Universal Curricular Taxonomy System (UCTS) can be applied to distinguish the components of different size and the role in training process. The UCTS divides the training materials on three levels: Curriculum, Module and Unit. These three levels of nomenclature determine the chunks of materials which can be used as a whole in the training process of various length and complexity.

The logged-in user of the E-archaeology Content Repository can download stored content in the form of SCORM packages (i.e. as e-learning courses). The system makes it possible to download different categories of material, such as curricula, modules and units, except for single learning objects.

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The system makes it possible to specify the structure of packages to be downloaded. It is therefore possible to download a SCORM package with the complete content of any given PU or numerous packages composed of individual elements of different PUs. This functionality of the system is very practical when it is required during a distance training to distribute training materials according to the training schedule, and not to share all the materials at the beginning of the training.

When using the E-archaeology Content Repository to prepare training materials for a training, the following key steps need to be followed:

1 – Browse Repository to find an appropriate content ready-to-use or content components to be used in a newly created course (select "My PU").

2 – Create a new content structure (choose "Create PU system"), and name it according to your training needs. Through the "Drag and drop" function, it is possible to select any PU stored in the Content Repository and embed it in the created course.

3 – Prepare the content for download (choose "Download SCORM" or "Download for WWW" and select the content structure (PU) depending on the training delivery needs.

Users with appropriate access rights can upload new content in SCORM (version 1.2 and 2004) and into the Repository. This functionality is intended for users who have produced e-learning courses themselves and want to share them with others. Following the uploading of an e-learning course into the system, all course components have to be interpreted in pedagogical terms using an appropriate model of didactic interpretations of content such as UCTS. As a result, a basic PU is produced.

E-learning courses that are downloaded from the E-Archaeology Content Repository can be integrated with teaching and conducted at a distance:

- To constitute basic training materials – an assisted web based training model.
- To complement educational processes designed in a different way – asynchronous learning (e.g. videoconferences), traditional teaching.

In the case of the assisted web based training model, e-learning materials can be delivered to the trainees according to an explicitly defined timetable. Study of the materials need to be supplemented by a range of collaborative activities, such as discussion forums, wikis, and chat. If materials from the content repository are

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designed to supplement a traditional teaching model, their role may vary depending on the specific training needs.

Click here to access <u>modules 9</u> and 10 for a full overview of technical aspects.

Quick step-by-step guidelines on the use of HEP

Heritage Educational portal is built as a wordpress website and is therefore easily editable. There is a general overall page in English that presents all the courses of partner organizations and there are national country pages currently corresponding to the ANHER project partner organizations. External organizations from the same country can use the overall page and existing national country pages or other national country pages can be added.

It is important, for the announcing and advertising of courses, to provide suitable information on the course pages (it is possible to provide full information both in English and national languages or only choose one of the two). Firstly, courses should be given one of the categories available in the platform (according to the topic) so as to be shown in the overall main page together with other organizations using HEP.

It is possible to link the course page to the delivery organization e-learning platform, where the e-learning materials are delivered and collaborative activities and communication with the trainer occur. In additional, through the "Course Importer" function it is possible to upload content in the form of Web presentations and link them to allow open source access to courses from HEP itself. Contact for assessing and using project tools: Arkadiusz Marciniak (arekmar@amu.edu.pl).

Examples – taken from courses run in ANHER partner countries

ITALIAN PILOT TRAINING – CASE STUDY

In the Italian case, the effort for the creation of a network and the joint work on the Carta di Pietrarsa were seen as positive outputs. In Italy, the course provided hands-on experiences. These included the joint work on commenting on the Pietrarsa Charter, reference documents for sustainable tourism in Italy, and sending feedback to the Ministry of Culture and Tourism, through the national ICOMOS delegation.

POLISH PILOT TRAINING – CASE STUDY

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One of the problems observed during the pilot training was a diversification of the trainee profiles: age, interests and professions. Among the Polish group of participants, 47.4% of trainees were foresters and 21.1% were archaeologists which had considerable impact on the way in which the group approached the modules content. Natural heritage professionals were more interested in studying the cases relating to natural heritage management, and cultural heritage professionals were more interested in the cultural heritage topics. Balancing the content of the training in such a way, so that it would be appropriate for all of the professional groups, had been a challenge that was only partially met.

The trainees also differed in age. Most of them were between 25 and 35 years of age (47.4%), the youngest participants(5.3%) were 24 years old and the oldest were 44 years old (10.6%). This age diversification had an impact on their competence of using the Moodle e-learning platform. The younger participants could resolve minor problems by themselves, but the oldest were often met with more problems and asked for the trainer's help. The oldest participants were also less interested in participating in forum discussions and they evaluated it as an improper way for exchanging ideas with other people. Younger participants who use this form of communication more often stated that fora discussions were a very interesting part of the training.

From the above-mentioned analysis of the trainees satisfaction with the course, we can conclude that e-learning courses are more productive when the group of participants is not very diversified in age, profession or interest. A special influence on the way in which the course is seen by trainees relates to their age. Younger people are used to using new technologies, computer programs as well as communicating via Internet which facilitates their work with the e-learning platform. Whereas the older participants were met with more problems while using the e-learning platform, which sometimes discouraged them from continuing the course.

DUTCH PILOT TRAINING – CASE STUDY

For the Dutch pilot training, a choice was made to make use of the innovative functionalities of the repository. Two curricula were designed and built from selected learning units, the smallest building block that could be taken out of the system. The selected units were connected into SCORM packages to form new Modules and these were structured into curricula. The method was a bottom-up build-up. We presented the courses through Blackboard and added extra

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introductory information to deliver cohesive content and formulate clear learning objectives.

Nonetheless, the critical feedback we received from our test group was in regards to the lack of cohesion, not so much the content, but the writing style, concepts, treaties and organisational bodies (i.e. UNESCO and ICOMOS) that were not properly introduced. From a teaching perspective, we mostly agreed and wanted to be able to re-edit the new course to improve the quality of learning.

Earlier trainings that we undertook were based on the modules as they were being designed. Alterations then were at the exclusion of learning units, to shorten certain parts. This use - retrieving modules rather than learning units from the repository - acquired a better response from our users. Lessons learnt from the present Dutch pilot training - be careful when building learning materials bottom-up instead of top-down.

UK PILOT TRAINING – CASE STUDY

The UK team undertook training by using an Open Course approach, via a website not an LMS. This meant that anyone could access the materials, the modules could be examined at any time and there was no scheduled course times. There were very high use rates, with a total of 281 unique visitors to the site with an average of 4.7 views per unique visitor. Some visitors viewed the same module more than once. However, these users were not motivated to complete the review survey, and ultimately none of them did so. To obtain feedback on the courses, a cohort of 18 users were recruited to provide this.

SPANISH PILOT TRAINING – CASE STUDY

During the implementation in Spain, different aspects of the e-learning process were highlighted as positive or useful. The selected units were tailored to create 5 modules with accompanying case studies and a discussion forum, which made the course easy-to-follow on a weekly basis. Though the training duration was set for 5 weeks, the course was extended up to 7 weeks overall due to the time constraint expressed by some of the trainees.

70% of the trainees were under 30 years old and the discussion fora were evaluated as an interesting platform to reflect on the content. Case studies were also positively evaluated, as students stated that they gave detailed and practical information about the topics covered during the modules.

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Nevertheless, learners found some of the concepts rather general and difficult to grasp, especially those units focused on European legislation. In general, 90% of participants agreed that the quality of the content was high and the structure of the modules was correct.

PORTUGUESE PILOT TRAINING – CASE STUDY

Portugal's training course on Cultural and Natural Heritage ran between April 21st and June 16th. The course was mostly targeted at history and biology teachers as well civil servants working in tourism, natural parks and land planning governmental bodies. The course was well received and considered of very good quality. However, despite the fact that it was known that the course would fully concentrate on an e-learning model, classic classroom moments were considered to be of utmost importance. In the future, the goal would be both to consolidate learning lessons, but above all, exchange information and form a network of like-minded people from different walks of life who could help each other out on future projects. This is something we will consider for future courses.

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