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Project Report

ENCODE4OpenU and the Preparation and Delivery of an International Collaborative MOOC: A Preliminary Analysis of its Pedagogical and Technical Implementation

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Abstract: Among the potential intellectual outputs of the ENCODE project is the production of a MOOC that introduces teaching staff and scientific experts to the digital transition in the field of ancient writing cultures. The basis for this MOOC is the need to foster awareness of the importance of digital competences and to use a structured framework to introduce people to the available innovative teaching and learning materials and opportunities for organizing (self-)training in this field of research. For specialists in the humanities, there is often an unexpected reluctance to go beyond simply using digital tools and to deepen their understanding of the implications of the digital transitions of research fields, as well as considering the readiness of young graduates to acquire digital competences. This MOOC, which is easily accessible, affordable, sustainable, and flexible, may achieve the initial aim of the project, namely, bridging the gap between the highly specialized competences in the humanities and the innovative digital skills needed in open science practices. The main methodological issue concerns the design and adaptation of cooperative tools in order to implement a common pedagogical approach and to produce MOOC content that integrates the different competences and insights of the project participants. This report on the experiment provides useful insights into the differing expectations of academic staff as content producers, issues surrounding MOOC-cooperative design between universities in different countries, the usability of the tested platform and of the different features provided, and sustainability, as guaranteed through the connection with digital infrastructures. In the concluding section, the originality of the MOOC at a more general scale is emphasized. The ways in which the MOOC can facilitate and support the digital transition are assessed according to the FAIR principles in Higher Education Institutions. Moreover, the MOOC offers models for hands-on experiences of digital training and the evaluation of learning outcomes according to shared European frameworks; it demonstrates the importance of being connected with larger projects and digital infrastructures.

Keywords: MOOC; digital competences; ancient written documents; digital epigraphy; digital papyrology

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1. Introduction

The present research takes place within the context of the Erasmus+ Strategic Partnership project, ENCODE. It addresses digital transformations in the cultural-heritage sector and within the OpenU project, which fosters cooperation, innovation, and sustainability in European higher education by creating a digital infrastructure for higher education policy experimentation through blended learning, mobility, and networking.

This paper is concerned with a specialized field of study in the humanities, as will be explained below. However, the approach to the present analysis, as well as the challenges we faced when developing our specific methodologies, may be of more general interest, especially in relation to the following issues:

(1) The project identified and described learning outcomes related to the new digital competences that are required to transition to open science, namely, the active participation of scholars in specific fields of the humanities in international digital infrastructures and in producing and sharing FAIR open data. We approached this issue by combining and adapting to the specific needs of two different competence and assessment frameworks, such as the CALOHEE assessment framework for history and the DigComp 2.1 and 2.2 Frameworks for digital competences. We suggest that this approach is also applicable to other subject areas.
(2) This research addressed the matter of how to design a MOOC for academics, teaching staff, and experts. The main issues addressed in the research include the transnational design of the tool for this specific target group and the choice of the relevant to other subject areas on a larger scale. More specifically, this paper considers the tensions that arise when integrating MOOCs into specific strategies of Higher Education Institutions or Networks of Institutions, such as UNA-EUROPA; we also consider the opportunities offered by International Digital Infrastructures. These opportunities include clustering scientific communities and fostering collaboration not only in the specific research area but also in training that is geared towards open science practices within the specialized communities and their interdisciplinary networks.

Specialized disciplines in the humanities that deal with ancient written artefacts, such as papyrology, epigraphy, and paleography, have embraced digital change by developing tools for new forms of participatory research and collaborative publishing. These innovations require new competences and training for graduate students and researchers in the rapidly evolving field of Digital Humanities and AI. Such training is necessary to prepare new professionals to contribute to preserving and giving access to the intercultural heritage of ancient texts in multiple ancient languages and writing systems.

ENCODE is a three-year (1 September 2020–31 August 2023) Erasmus+ KA2 strategic partnership for higher education. It is funded by the EU and aims to bridge the existing gap in the teaching/learning domain of ancient writing cultures between highly specific humanistic training and the digital competences now required for study, research, and employment. It brings together six partners: Alma Mater Studiorum Università di Bologna, Julius Maximilian Universität Würzburg, KU Leuven, Università degli studi di Parma, Universität Hamburg, and Universitetet I Oslo. Three objectives, which consider societal, educational, and institutional needs, were established for the project:

- To promote collaborative, participatory, and intercultural digital approaches to ancient written heritage through new professional profiles and the focused training of skilled graduates;
- To meet the learning needs of graduates who apply highly specialized digital skills to the study of ancient writing media in old European, Asian, and African languages, through innovative teaching modules;
- To strengthen the crucial cooperative connections between higher education and cultural heritage institutions, with the latter supplying materials for teaching and self-training to academics and providing stakeholders with support services.

The project foresees the teaching modules being implemented through seven transnational events. First, open international workshops and intensive training events for members of the project will be organized. These will train up to 80 international graduate students and academics and up to 51 graduate students and academics from university partners. In addition, international multiplier events, connected to the aforementioned workshops and supported by a concerted dissemination effort, will involve up to 210 international graduate students, researchers, and stakeholders/employers. By the end of the project, the modules will be available online to be used, implemented, and customized according to different European contexts and teaching/learning needs. From a methodological point of view, these modules will achieve the following:

- Be based on an internationally shared definition of learning outcomes, taking into account the relevant European frameworks;
- Use innovative pedagogies, enabling mutual learning among trainees and teachers, lifelong learning for both (being designed as trainee-centered modules), and research-based learning (being conceived as modules that foster problem-based learning, creative planning, and hands-on work, which replicates the forms of knowledge creation and dissemination used in professional contexts);
- Enable modular integration into courses according to training needs and contexts, and be amenable to future development and implementation according to the evolution of technologies and training practices;
- Foster the inclusion of the training sets inside the university study curricula, increasing appeal through ICT-enriched learning and real-world applications.

ENCODE foresees six intellectual outputs. The MOOC/Introduction to the teaching staff (including both academic staff and experts in cultural heritage institutions) is thus connected with five other outputs: a survey on digital competences; learning outcomes and best practices in teaching and learning; a description of and resources for teaching modules at a basic level, and at an advanced level; guidelines for teaching academic staff; and a platform for the alumni community and stakeholders/employers, which will be connected with the GoTriple infrastructure. The strongly interconnected nature of the project outputs has the aim of producing a coherent package, which is based on a shared definition of the required digital competences of graduate students in programs focusing on written cultural heritage. This provides a foundation for transnational training activities and constitutes the basis both for the implementation of a specific platform for employers and employable graduates and for improving cooperation between higher education institutions and stakeholders. The design and testing of innovative and customizable teaching modules (basic and advanced), which improves participatory and intercultural approaches to heritage, as well as educational initiatives aimed at fostering intercultural dialogue, are accompanied by a full guide to the teaching modules, including the MOOC; these materials convey the importance of innovative digital training and digital applications in the academic and professional environments. For literature that focuses on teaching and learning practices in the field of digital competences applied to ancient written cultures, see [1–4].

The production of a MOOC within the ENCODE Project should therefore introduce teaching staff and scientific experts in the field of ancient written cultural heritage (papyri, inscriptions, manuscripts, and other objects from different cultural contexts that contain writing in different languages and scripts) to the digital transition and new open science practices. As a consequence, the MOOC is designed as a strategic tool within the more general context of the ENCODE project, which is aimed at enhancing digital competences in the aforementioned specific scientific areas and interdisciplinary fields. In particular, it should encourage informal self-training and participation in structured training as part of a process of life-long learning through a set of training modules and examples collected through the same project.

We note that in academia in general, and in our specific field, which is concerned with the study of ancient written objects, there is often an unexpected reluctance among teachers to engage fully in the incorporation of digital tools and methods into different domains of study; moreover, awareness of the developments and practices of open science is still lacking. At the same time, young graduates are willing to acquire digital competences in their research fields. Having noted that the platforms for MOOC delivery that are currently available in universities are too rigid for the expectations of a cooperative endeavor targeted at teachers, experts, and academic staff, we felt the need to open up to an international and interdisciplinary audience the useful tools that have been produced in an international context and specifically designed for collaborative implementation. For these reasons, the ENCODE MOOC needs to be a tool that is easily accessible, affordable, sustainable, and flexible. Moreover, since the MOOC is a product of transnational cooperation between different universities, the platform should accommodate different pedagogical approaches

and communication strategies. This experiment analyzed the challenges that can be encountered during the preparation of an international collaborative MOOC, specifically in relation to the platform used to deliver such pedagogical formats.

The design of a cooperative MOOC by a group of scholars from different universities required as a first step the choice of a MOOC model from among the many different formats that have been developed in the last 20 years. The four key characteristics of MOOCs are as follows: (1) their massive scale, (2) the open and free involvement of participants, (3) their online dimension and digital nature, and (4) they have the structure of a 'course', namely, a learning path with specific learning outcomes and assessments. Considering these characteristics, we decided that, in our context, we should consider the training needs of the specific target group to whom we plan to offer the MOOC. This means that the MOOC model, spread by the courses offered through special platforms such as Coursera, Udacity, and edX, in which the core teaching is delivered through online recorded lectures combined with computer testing, would not be the most appropriate for our research. Regarding the main elements of a MOOC explained above (massive, online, open, course), the focus group discussion helped us to understand that, in our case, 'massive' would not mean reaching out to a potentially huge number of participants, but rather a vast targeted audience; meanwhile, for the 'open' and 'online' dimensions, we decided to put a strong emphasis on a deeper awareness of open science practices in the wider sense, namely, introducing FAIR principles both into the content and into the design of the object. Finally, although we plan multiple entry points to our material, we contend that organizing our materials into a 'course' is extremely important and offers an example of pedagogical design, even considering the fact that our target audience will use the course material in very different and flexible ways, through multiple entry points and combinations. For this reason, when organizing the learning material and choosing a platform, we made decisions that would allow us to go beyond the classical models of MOOCs and move towards other models that emphasize a stronger openness in terms of content, activities, and ways to use the teaching material. As such, we can focus on the autonomy of the learner, in terms of learners choosing what content or skills they wish to acquire, and on diversity, imagining participants with different knowledge levels and different interests. Our MOOC, however, will not be able to offer the interactivity that is needed in terms of cooperative learning, nor will it offer communication between participants within the MOOC framework itself. However, in order to achieve our aims of allowing new knowledge to emerge and be shared, we take advantage of the ENCODE community and activity on the GoTriple Platform, as well as that of other practice-based communities in the field, such as the EpiDoc community, and the opportunities of training that are constantly being organized. On the characteristics and pedagogy of MOOCs, see [5–7].

The starting point for the development of the course structure and content is based on the programs and content of the ENCODE Multiplier and Training events, which also represent the main fields of expertise of the partner universities. In this way, we attempted to cover as comprehensively as possible the topic of the use of digital technologies for the study and research of ancient writing cultures. For this reason, the MOOC is divided into four units: "Digital Greek and Latin Epigraphy" (coordinator: the University of Bologna), "Linked Open Data for written artefacts" (coordinator: the University of Hamburg until 02/2022, and the University of Leuven), "Multilingual-Multicultural Digital Infrastructures" (coordinator: the University of Leuven and the University of Oslo), and "Crowdsourcing and Greek and Latin Papyri" (coordinator: the University of Würzburg and the University of Parma). To our knowledge, there are no extant MOOCs that focus on a similar subject: one experiment that focuses on the digital encoding of texts transmitted by the manuscript tradition is the MOOC created by Marjorie Burghart and Elena Pierazzo, titled "Digital Scholarly Editions: Manuscripts, Texts and TEI Encoding", which is hosted by the #dariahTeach platform; our MOOC aims to relate to this other course, but with a different approach. On #dariahTeach as a platform for open educational resources that are engaged in the promotion of MOOCs, see [8].

This research is important because there are currently no tools that present the different applications of digital technologies to the study and research of ancient writing cultures to a non-expert (but potentially interested) audience. On the other hand, this MOOC, conceived as an accessible and stimulating tool, aims to win over the scholars who are reluctant to engage with the digital aspects of the study fields in which they are involved and to raise awareness of the importance of standards and linked open data for scientific cooperation in international digital infrastructures. Indeed, the addressees are primarily teachers and experts who want to understand more about and introduce innovative teaching and training methodologies, digital resources, and tools in their traditional teaching or actively participate in digital infrastructures. From an educational point of view, this MOOC is part of an effort to integrate digital tools into the traditional teaching of disciplines linked to ancient cultural heritage, focusing on digital approaches to problems and project-based learning, as well as on the personalization of flexible learning paths. At the same time, the medium through which the contents are delivered both allows the users to become familiar with digital tools and also helps designers to realize some of the MOOC's features, such as its ability to reach a vast targeted audience, its openness and its learner-centered activities.

2. Materials and Methods

Undertaking this research in the context of the OpenU project provided us with the opportunity to deepen our understanding of the cooperative dimensions of our endeavor. Additionally, it allowed us to explore the specific implications of building a MOOC that will be offered transnationally with the following aims: (1) to improve the digital skills of the target group (teachers, experts, and academic staff); (2) to create a more general awareness of the digital transition and of open science practices, and to facilitate appreciation of its implications for research and innovation in teaching and learning; (3) to describe challenges and best practices in designing digital training resources for students in terms of learning outcomes and effective pedagogies; (4) to offer structured access to training and self-training materials; (5) to offer opportunities for participants to join active practice-based communities in the field of digital humanities within and beyond the specific areas of study. The objective of this specific segment of our research was twofold: first, there was the challenge of defining the specific learning needs and, more specifically, the learning outcomes for the MOOC through shared frameworks, which could transcend the specific educational contexts of each institution and promote the transnational dimension. The second challenge, which is connected to the first, is that we wanted to design and deliver the MOOC through a platform that has the ability to emphasize and demonstrate, within the learning experience, the features of working within a digital infrastructure, and to address implications in the design of training related to the digital transition.

Two of the main outputs of the ENCODE project are definitions of (1) the learning outcomes and (2) the digital competences required by scholars in disciplines related to ancient written cultures, both of which served as key building blocks for the development of the MOOC. On this, see [9]. In order to identify these learning outcomes and competences, questionnaires were administered to teachers and students involved in the workshops and training events of the ENCODE project. Survey participants were asked to describe and evaluate their transnational training experiences with digital competences applied to ancient written cultures, both within the ENCODE project and beyond. Moreover, they were asked to share and discuss the best teaching and learning practices. The sample comprised 142 participants: 36 teachers and 106 students. The detailed survey results are presented in a report on 'Digital Competences, Learning Outcomes and Best Practices in Teaching' [10] and a report on 'Learning and Hands-on Workshops' [11], both also available through the ENCODE project's website.

The survey results formed the basis for the development of a framework of digital competences that distinguishes four levels of proficiency (basic, intermediate, focused, and advanced). Such a framework for digital competences applied to ancient written cultural heritage disciplines was lacking. However, to be able to advance and improve

education and training in this domain, a framework is highly needed, both for students and teachers. In addition to the survey results, two international reference frameworks, CALOHEE [12] (for humanistic competences) and DigComp 2.1 [13], updated recently to v. 2.2 [14] (for digital competences), were used as input and inspiration for the development of the framework of digital competences, particularly for the field of ancient written culture disciplines.

The definition and identification of learning outcomes and digital competences added value to the Multiplier Events and training activities organized within the context of the ENCODE project. Moreover, the learning outcomes and competences were used as the basis for the development of the unit and chapter structures of the MOOC. By identifying teaching and training needs, the specific topics of the MOOC were selected, and decisions were made regarding their place in the unit and chapter flow. In the MOOC structure, the learning outcomes are clarified at the beginning of each of the individual units. A self-assessment test at the end assesses the achievement of the learning outcomes, but it also gives further feedback on the digital competences that may be further fostered. The incorporation of a form of evaluation is useful in stimulating users to reflect on the digital (re)sources addressed in the course and invites them to explore different digital tools in the domain of ancient written texts, following the flexible structure of the SunoikisisDC teaching program. On the design of MOOCs based on the definition of learning outcomes, see [15].

This structure classification by learning outcomes and competences is also at the basis of the teaching modules included in the ENCODE Database, to which the individual chapters of the MOOC refer and through which, alongside other external resources, users can deepen their knowledge of the individual topics. In this sense, the MOOC is, in fact, not only a course for acquiring digital competences, but it represents an ideal pathway through which users can become aware of opportunities for digital training in the field of ancient written cultures. It offers them a structured introduction to the available training and self-training materials, which can be used both for improving the user's own competences and to design and deliver training courses for students. As far as the digital platform is concerned, the team explored several possibilities before selecting the preferred platform.

The first platforms we explored were the ones offered by the University of Bologna and the University of Leuven. Both universities offer the opportunity to develop MOOC courses; however, they are conceived primarily as synchronous courses with some opportunity for social interaction among the participants and/or instructors. This implies that every MOOC has to be delivered at fixed times; participation can be free and the participants who complete the course obtain a final badge/certificate. However, even if there is the possibility of navigating parts of the MOOC units (predominantly those that comprise videos from YouTube) beyond the fixed periods of delivery, the educational context would be missing. Another issue that discouraged us from using one of these platforms concerns the fixed framework for planning and implementing the course and videos; this limitation made it difficult to design the course in conjunction with the responsibility being distributed among the international partners. To broaden our scope, we explored the platform of the EC in which all Erasmus+ projects upload information about project goals, strategies, and results.

From this exploration, we identified some interesting experiences and selected one as a noteworthy example: a project called "YouTrain", aimed at producing video tutorials for instructors engaging in non-formal education. This project was instructive on three different levels:

- First, it produced a MOOC, which is extremely simple: it is a web page structured in seven sections/steps. Each step includes a short text introduction and one or more videos. That model—even if it appears overly basic—responds to one of the main needs we identified: the motivation of our colleagues and staff, who are using the MOOC on a voluntary basis, and who may only use single parts and skip others as they do not want to be forced to learn within a rigid structure;
- The second interesting aspect of the project is the content. The MOOC produced by the project "YouTrain" deals with issues related to non-formal education, so it gave us

good ideas for the units that deal with pedagogy, especially since the modules we will be promoting are targeted not only to staff members operating in formal educational contexts but also towards (self-)training by graduates and specialists. Some videos offer excellent examples of this approach as they are short and simple but, at the same time, informative and stimulating, and include high-quality info-graphics;
- Third, it offers some tutorials which can be useful in designing a MOOC for non-formal education.

The need for an open environment that enables a more distributed approach to the design and implementation of the MOOC led us to explore options offered by free platforms. Google Education, for instance, provides a good guide and open technology for MOOCs and online courses with great flexibility. Another option that we explored was the platform of #dariahTeach, developed within the Digital Research Infrastructure for the Arts and Humanities (DARIAH) initiative, which is an important Digital Research Infrastructure established as a European Research Infrastructure Consortium (ERIC) in August 2014. This special project offers a platform for open educational resources (OER) for Digital Arts and Humanities educators and students, with a specific focus on the digital transformation of program content and learning methods. The #dariahTeach objectives and design are strongly in line with our goals since they are aimed at innovating learning and teaching materials related to the digital transition in the humanities through flexible models of publishing and accessing courses. For the MOOC design, see [16].

3. Results

The research allowed us to find sustainable solutions for the design and delivery of a MOOC targeted to a diverse audience of teachers and professionals in the field of written cultural heritage. This MOOC will be aimed at motivating participants to improve their understanding and awareness of the implications of the digital transition in their field in relation both to research and to teaching.

3.1. Design

We realized that the design of a transnational educational resource related to important transformations which affect the disciplinary field needs to connect to and can benefit from developments carried out by larger communities. Our specific project was informed by three processes that affect the larger field of the humanities, the field of digital competences in general and the Digital Humanities as a specific disciplinary field. We had the opportunity to embed the innovations carried out by larger projects and to incorporate them into the actual teaching and learning design and practice of our MOOC.

First, we based our understanding and definition of competences and learning outcomes on the methodology developed by the Tuning Academy within the CALOHEE project. Our conceptual model relates to the competence framework developed for the Humanities (history subject area), especially for sub-dimension 2, which is related to "texts and contexts"; this appeared particularly valuable for the area of written cultural heritage. At the same time, however, we were faced with the specialized disciplines in the humanities that deal with ancient written artefacts, such as papyrology, epigraphy, and paleography, which have embraced digital change and recognized the need to develop tools for new forms of participatory research and collaborative publishing. These innovations require new competences and training both for graduate students and for researchers in the rapidly evolving field of Digital Humanities and AI. These competences are essential in preparing new professionals to contribute to preserving and giving access to the intercultural heritage of ancient texts written in multiple ancient languages and using different writing systems.

For this reason, we implemented a second framework: the Digital Competence Framework for Citizens (DigComp). This framework addresses digital transformation and was developed with the aim of defining what digital competence is. It, therefore, provides a shared basis for educational innovation, taking into account the labor market and societal changes. DigComp, as the EU-wide framework for developing and measuring digital

competences in March 2022, has been published in its 2.2 version, which takes into account developments in the field of AI as well. When designing the learning outcomes of our training activities (which were also connected to the MOOC), we faced the challenge of combining in our approach both the methodologies developed by Tuning and CALOHEE, which has an explicit focus on the formal context of higher education and DigComp 2.2, which is considered a wider reference framework for citizens' competences. Notwithstanding this important and foundational difference, it was possible to work with the two frameworks since both share common features, such as being articulated in 'dimensions' according to competence area. While CALOHEE formulates reference learning outcomes relative to levels 6 and 7 of the Higher Education Qualification Framework (integrating both the descriptors of EQF and the QF-EHEA), the DigComp conceptual model was used to develop a matrix of five dimensions (information and data literacy; communication and collaboration; digital content creation; safety; problem-solving) with four progressive overall levels (foundation, intermediate, advanced, and highly specialized), articulated in eight granular levels. This matrix is independent of qualifications, and levels are built on three main areas of mastery: (1) complexity of tasks, (2) autonomy, and (3) cognitive domain (remembering, understanding, applying, evaluating, and creating).

Third, through the surveys offered to participants at the end of the teaching activities, which were analyzed in a dedicated report (see above), we could see that the way we combined the two frameworks in order to formulate the learning outcomes and competences in our training activities helped the learners to focus on these competences in the disciplinary field of the humanities. In fact, they achieved mastery before the training activity, and at the same time understood how the digital training improved their knowledge, awareness, and skills within their specific field of study, and not just as a separate competence. Building on this result, we designed our MOOC by sharing this experience with future trainers and offering them a methodology to work with different competence frameworks; in addition, we offer a specific introduction to digital content and the basic knowledge and skills that will enable participants to develop from being users of digital content to creators of digital transformation when planning their own self-training or training activities for their students.

3.2. Delivery

The analysis of the different MOOC models and platforms and the choice of the #dariahTeach platform further confirmed the advantages of connecting to wider initiatives and exploiting the results and outputs of other Erasmus+ projects. In our specific case, the added value of working within #dariahTeach is not limited to the easy sharing of a dedicated platform but primarily concerns the ability to connect to a community engaged with the different facets of the digital transition in the humanities, especially with the much-needed training in open science practices, production, and the dissemination of FAIR research data. Lastly, the #dariahTeach platform offers the necessary flexibility both to the contributors and to the participants in the course, allowing for the development of a flexible and personalized course (with some basic tools to evaluate the learning process). These well-structured courses are divided into units, with further subdivision into lessons and pages (equivalent to book chapters, sections, and pages). This design allows instructors to utilize the entire course or to select only those units and sections that are relevant to their own course objectives and learning goals. To this extent, the choice of the #dariahTeach platform is strategic (especially with regards to the sustainability of the infrastructure) and it is combined with the use of the GoTriple platform and its add-on for hosting activities of the community of participants (trainers and trainees) of the ENCODE workshops and training events, and of the MOOC.

4. Discussion

The development of a MOOC of this kind, which was intended as an open, free, and stimulating tool that allows users to understand the importance of acquiring digital

competences in the field of ancient writing cultures, fills a gap in the field. Few European universities offer curricular courses on this topic, and opportunities to learn digital skills in the study of epigraphy, papyrology, and other related disciplines are limited to occasional workshops and training activities. These activities, moreover, mainly attract students and scholars who are already (somewhat) familiar with the tools presented or are already interested in acquiring such competences. On the other hand, in the context of such workshops and training activities, communities of scholars linked to digital infrastructures and projects often produce freely reusable and continuously updated materials. The goal of this MOOC is, therefore, twofold. First, it aims to capture the attention of users unfamiliar with these topics and to encourage them to go digital. Second, it aims to collect the available online resources in such a way that users can independently undertake an initial self-education and/or reuse them in teaching. ENCODE thus offers a systematization of the various materials produced by consortia, such as the aforementioned SunoikisisDC, and communities, such as EpiDoc, for the digital encoding of ancient sources; moreover, it integrates these materials with those produced by the project's own intensive training activities, in such a way that they can also be reused in future workshops or incorporated into traditional teaching. This is also possible thanks to the connection of the MOOC with a network created by the ENCODE project, which ensures constant and dynamic contact among different actors, such as employers, institutions concerned with digital curation, professionals active in museums and libraries, alumni, prospective students who want to start their studies in the area of ancient history, and academics working in languages and cultures who design curricula and training modules. The future network will rely on the European infrastructure GoTriple and on the connected social network Trust Building System; for further details, see [17]. In the meantime, ENCODE will gradually gather a community through its mailing list, which is used to disseminate information on upcoming events and professional positions.

5. Conclusions

This effort to produce a cooperative MOOC targeted at potential trainers (teachers, academic staff, and staff at cultural heritage institutions) generated the following insights on policy issues, which may be useful if shared within the wider community of Higher Education Institutions (HEI):

1. Within specific disciplinary fields (in our case, disciplines concerned with ancient written cultural heritage), an increasingly rapid digital transition is underway; this transition is connected with a wider awareness of the need to implement open science practices. Researchers (in our field as in many others) are urged to produce, manage, and share FAIR data, coordinate efforts within digital infrastructures in order to integrate research data and publications and connect with other researchers and projects to build a critical mass of searchable data across disciplinary fields. Academics and teachers, as well as researchers working in cultural heritage institutions, are not always adequately prepared to keep their knowledge up-to-date and to transfer these research competences into their daily teaching or training activities. Our research builds on the assumption that it is necessary to support teachers and academics by providing simple, easily accessible, and reusable teaching and learning materials, information about past training events (to consider as possible models), and future training events in which they can participate. The present effort, however, responds to the fundamental need to encourage academic staff to innovate in teaching and learning. Through focus groups among participants at the training workshops, we learned that international practice-based communities within fields of scientific research are the resource academics and researchers will most likely look to for support; it is, therefore, important to keep this link and to build motivation by offering training (in our case, a MOOC) which uses the infrastructures, platforms, and tools that are more directly connected with the scientific area. Through this MOOC, participants will be introduced to developments in the field and models and materials for in-

novative training formats and practices. This may, however, be challenging for the institutions that intend to develop and structure policies, infrastructures, and facilities for improving the digital transition in education and support opportunities for the professional development of staff, either at the level of a single HEI or at the level of a network of institutions. Our recommendation is that HEI institutions should develop policies that account for the different strategies and opportunities for professional development that are designed and implemented in scientific fields. New institutional infrastructures and facilities should be as flexible as possible to interoperate and communicate with a multiplicity of initiatives developed within the different disciplines or within interdisciplinary research communities since the wide movement towards open science have now reached a consensus on many common standards; this can be observed in the European Open Science Cloud Portal and Marketplace.

2. From our experience, one of the most promising training models that might be used to bridge the gap between highly specialized humanistic competences and the digital skills needed to participate in international digital infrastructures are short intensive training activities in which trainees can practice hands-on digital encoding and review their work within the training group.
   Our experience with short intensive training (either in person, online, or blended) has shown that the most effective and motivating approaches include international groups and a research setting that can produce results to be published and shared on digital infrastructures; this is also confirmed by literature on the format of training activities related to digital competences in the field of ancient writing cultures [18]. These formats might benefit from further developments within the Erasmus+ Blended Intensive Programs scheme, where groups of students or staff undertake a short-term placement abroad, as well as participating in a compulsory virtual component that facilitates collaborative online learning exchanges and teamwork; such formats could play a role in the development of HEI policies for blended learning (see [19]). In this regard, we again suggest that there should be a strong effort to connect with the open science initiatives that are developing within international digital infrastructures.

3. We note that, when designing training activities in an international setting, it is helpful to refer to common reference points that can help to overcome the barriers created by local and national contexts. Within the ENCODE project, as illustrated in this article, we have experimented with ways to design learning outcomes for short intensive training and to deliver micro-credentials that can fit into shared European frameworks, namely, CALOHEE and DigComp 2.2. This experience is incorporated into the MOOC in order to offer a tool to teachers who are facilitating the design of trainee-centered modules, which can be shared in an international environment.

4. Training for the digital transition within disciplines is best organized at an international level in order to take advantage of project-based work within international digital infrastructures. Connections with larger projects and infrastructures enable us to constantly update training needs and training resources according to the evolution of technologies and practices. In this context, we should also note that this approach allows for the design of research-based learning, fostering problem-based learning, creative planning, and hands-on work that replicates the forms of knowledge creation and dissemination seen in professional contexts. The reciprocal learning among trainees and teachers in the same research training environment is also beneficial and relies on an recognition of the efficacy of cascade training dynamics: the digital training of graduates fosters the subsequent implementation of teachers' awareness, digital self-training, and engagement. On the cascade effect in self-education and project-based learning, see [20].

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