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DESIR

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Executive Summary

- To the extent that it has been theorised, work on DH pedagogy has tended to be very strongly tied to the classroom experience. A classroom experience, however, exists within a particular social and institutional framework (students seeking knowledge, experience or qualification from instructors who master a specific body of knowledge) which is quite different from the operational and distributed nature of Research Infrastructures such as DARIAH.
- Research infrastructures seldom possess the kinds of specialised procedures, staff, resources and expertise to deliver formal educational programmes, but the strength of RI's lies in the provision of and reflection upon the experience of acculturation and professionalization in "real" cross-institutional and often cross-cultural projects in which peer learning, skills transfers and network building are a rule rather than an exception.
- Research Infrastructures such as DARIAH have a specific role to play in the European educational landscape by complementing rather than replacing the pedagogical models prevalent in HEIs today.
- RI's such as DARIAH should focus not only on DH or even on a discipline in which a student or researcher seeks to use DH methodologies, but also on highlighting how these practices engage interdependent communities of practice with intersecting concerns.
- DARIAH should intensify effort to position itself as pedagogically relevant beyond the individual humanities disciplines in terms of what it can contribute to the development and dissemination of early-career researchers' transferable skills and competences as identified by the Eurodoc 2018 Report.
- DARIAH should establish an active educational partnership network in order to validate a new approach to the skills needs of humanities students and researchers, looking beyond the frame of what is currently available in the context of formal educational programmes.
- DARIAH should develop a curricular model and, if possible, an internship program, to enable fluid exchange of knowledge and students between university programmes and the applied contexts of the research infrastructure.
- DARIAH should continue to create and maintain essential filtering and contextualising layers for training materials, which are now available through DARIAH-Campus, in order to coordinate and enhance open educational resources with other stakeholders in the field.
- DARIAH should aim to apply and test its learning resources in different HE contexts in order to profit from unforeseen synergies and unexpected outcomes such as, for instance, the initiative to publish young researchers' data papers using the DARIAH-Campus Event Capture Template, which emerged out of the DESIR Workshop at the University of Neuchâtel.

- Building on currently identified needs, DARIAH should develop foresight models to predict future needs within the Higher Education sector.

Nature of the deliverable		
✓	R	Document, report
	DEM	Demonstrator, pilot, prototype
	DEC	Websites, patent fillings, videos, etc.
	OTHER	
Dissemination level		
✓	P	Public
	CO	Confidential only for members of the consortium (including the Commission Services)
	EU-RES	Classified Information: RESTREINT UE (Commission Decision 2005/444/EC)
	EU-CON	Classified Information: CONFIDENTIEL UE (Commission Decision 2005/444/EC)
	EU-SEC	Classified Information: SECRET UE (Commission Decision 2005/444/EC)

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Introduction

According to the DARIAH Strategic Plan (currently in Draft Version 4.0, hereafter DSP), DARIAH's mission is to empower research communities with digital methods to create, connect and share knowledge about culture and society. As a knowledge network and a service provider, DARIAH plays an important social role: enabling smart research using digital tools, but also contributing to the development of the Digital Humanities as a transdisciplinary community of scholarly practice. Training and education is defined by the DSP as one of DARIAH's four strategic pillars. The DSP recognises that universities and research centres are among DARIAH's closest contributors and that DARIAH should not duplicate the important work done within these contexts. In line with this, DSP states: "we do not want to reinvent ourselves as a university, however, so positioning DARIAH as a unique provider of or collaborator for education and training will be a significant challenge of the model we seek to realise." In other words, DARIAH aims to complement that stakeholder community in many ways, including in the provision of training and education.

A second Strategic Action Plan (STRAPL), which builds upon the first with more specific and tangible objectives and actions, elaborates that DARIAH's action to "create a coherent approach to training and education" will involve "systematic cooperation with the University sector" and "the targeted development of new material and quality assurance."

This report builds on both of these strategic documents as well as the *DESIR D7.2 DARIAH Training Materials Assessment Report*, which evaluated the current DARIAH-associated training materials and made a series of recommendations as a way of informing further strategic discussions within DARIAH, including the development of DARIAH-CAMPUS, a brand new DARIAH service which functions as both a discovery framework and a hosting platform for learning resources.

DARIAH-Campus, a DESIR outcome, was launched at the end of 2019 as a single entry point to all things related to training and education (T&E) within DARIAH. Thanks to DARIAH-Campus, which has not only fulfilled the need for consolidating and aggregating content, but will also, in the year to come, be used as a generator of community activities around the production of new learning resources, DARIAH is now in a better position to focus on strengthening its relations with higher education institutions (HEIs) and research producing organisations (RPOs).

More specifically, this report has a three-fold aim:

1. to assess the challenges of DH pedagogy and the role assigned to RIs in the T&E process;
2. to evaluate the preliminary steps that DARIAH has already taken to meet the DSP's aim to "create a firmer basis for collaboration between RIs and RPOs;" and
3. to provide suggestions on future directions in this area; including recommendations on how to build stronger and formalised relationships with its members and partners in T&E.

This report provides an overview of the initial steps that have been taken to include DARIAH training and education resources into structured university curricula. It demonstrates this through case studies involving two separate initiatives, #dariahTeach and PARTHENOS; and a proposed new use case of DARIAH-Campus, which emerged out of a DESIR workshop at the University of Neuchatel in December 2019. While recognising that this process is still in its early stages, the report outlines new directions for DARIAH to take in order to strengthen its role as a provider and disseminator of training and education materials for use in Higher Education curricula.

Challenges of DH Pedagogy

The digital humanities have a systemic tendency toward disruption, of methodologies, of disciplines, of epistemic cultures, and, indeed, of pedagogy. From an early point in the history of the systematic integration of technology into humanities research processes, innovative and integrative approaches to both the conceptualisation and delivery of the necessary skillset for humanities research have appeared. The first iteration of the longest-running Digital Humanities training school, the University of Victoria's (UVic) Digital Humanities Summer Institute, was held in 2001 and, in that year, included an explicit track on Digital Humanities pedagogy. Europe began to follow this North American model a few years later, with the launch in 2009 of the European Summer University in Culture and Technology at the University of Leipzig and shortly afterward the Digital Humanities at Oxford Summer School. These forerunners were themselves succeeded by further formal and informal, repeated and once-off events, with an eventual turn toward certificate, masters, PhD and undergraduate programmes becoming established worldwide (a move that can be tracked, at least in part, through the registry data of the DARIAH-instigated DH Course Registry (<https://dhcr.clarin-dariah.eu/>), now also available via DARIAH-Campus.

All of this said, the focus on establishing and sharing norms for DH pedagogy established at that first DHSI at UVic did not, ironically, seem to become a common feature of these many and varied successors. In the introduction to his 2012 volume on digital humanities pedagogy, Brett Hirsch refers to what he calls the 'bracketed' status of the topic of his work: "By 'bracketing' I refer to the almost systematic relegation of the word "teaching" (or its synonyms) to the status of afterthought, tacked-on to a statement about the digital humanities after the word 'research'..." (Hirsch, 2012, 5). Matt Gold's assessment of the state of the field is similar: "the digital humanities, as a field, would benefit from a more direct engagement with issues of teaching and learning than it has exhibited thus far." (Gold, 2012, 153) Although some further work has appeared since that time, the phenomenon that Hirsch observes, whereby the way in which DH knowledge is transmitted takes a very subsidiary role to that of how it is created, does appear still to be largely the case.

In addition, to the extent that it has been theorised, work on DH pedagogy has tended to be very strongly tied to the classroom experience: how to embed the digital into the

traditional humanities teaching experience, what tools to use (or not), how to balance between theoretical understanding and active participation. This may seem a banal observation, or at best a recognition of something natural and expected, but we should not forget that a classroom experience, no matter how well-constructed, exists within a particular social and institutional framework: students, seeking knowledge, experience or qualification; one or more instructors, with mastery of a body of knowledge; and usually institutional or curricular boundaries, those 'hidden histories' of disciplinary communities (Terras, 2006, 13) and embodiments of a 'political vision' (Simon, cited in Hirsch, 2012, 27). These restrictions can fly in the face of the stated aim of many of the pedagogical experiments described in the literature to "reconfigur[e] the academic journey itself" (Saklofske et. al, 2012, 323).

In the years since the appearance of Hirsch's volume dedicated to DH pedagogy and Gold's four-chapter thematic collection dedicated to DH pedagogy in his *Debates in the Digital Humanities* series (a topic that is due to return to this series in 2020-2021), additional work has, of course, appeared, though not as much as might have been expected, and with a few strong organising themes dominating. The first of these is the role of libraries in the teaching of DH and the development of appropriate approaches and pedagogies to underpin this (e.g. Varner, 2016; Fay and Nyhan, 2015; Burns, 2016; Hartsell- Gundy et. al., 2014). Another cluster within the work focuses on how to develop pedagogies around specific tools, disciplines or approaches, such as digital storytelling (Barber, 2016), electronic literature (Saum-Pascual, 2017), or VREs (Bellamy, 2012). A third interesting set of convergent perspectives appears around the question of how to teach digital humanities without letting it become an end in itself, without losing the essentials of teaching (e.g. Cordell, 2016; Ives, 2014). One of the most interesting examples within this cohort is Paul Fyfe's essay on 'Mid-Sized Digital Pedagogy,' (Fyfe, 2016) which, in reflecting on the range of pedagogical spaces between MOOCs and "sequestered learning" comes out strongly in favour of a number of methods by which to foster student-led, and, in particular, experiential approaches to learning.

In taking this focus, Fyfe's work echoes some earlier work by Geoffrey Rockwell and Stefan Sinclair, work that has particular resonance for the question of how research infrastructures might play an expanded role in DH education and training. Rockwell, who had previously observed that in the digital humanities "there are few formal ways that people can train" (Rockwell, 2010), makes a significant contribution to breaking down this barrier in his chapter in Hirsch's volume (co-written with Stefan Sinclair) on "Acculturation and the Digital Humanities Community." As Rockwell and Sinclair describe the challenge of DH pedagogy, the rethinking of teaching needs to begin at the most fundamental level:

"One can think through a digital humanities curriculum in three ways. One can ask what should be the intellectual content of a program and parse it up into courses; one can imagine the skills taught in a program and ensure that they are covered; or one can ensure that the acculturation and professionalization that takes place in the learning community is relevant to the students." (178)

From the research infrastructure perspective, for reasons that will be explored in more detail below, of most interest is this third path, because many of the things that digital humanists typically do -- “work in interdisciplinary teams, apply digital practices to the humanities, manage projects or collaborate in the management, explain technology and build community” (182) -- are more a matter of practice, the “how” rather than the “what”, and very much the kind of practices that are best viewed as cultural, rather than a skills, transmission. Rockwell and Sinclair focus very much on how students can engage with real teams and real projects, but the initiatives they describe do still give the impression of being limited, by student scheduling, by the capacity of host organisations to absorb the students’ development, by the need for eventual evaluation by the classroom instructor etc.

As we continue to develop our understanding of what it means to teach the digital humanities, we need also to reconsider the utility, responsibility and potential contributions of other actors than universities in this process, and how we integrate them into recognised learning pathways. Doing so will allow us to invent new frameworks for the teaching and learning of the digital humanities; it will enable peer learning, which has been identified as the most desirable and effective way digital humanities skills are transferred (Antonjevic, 2015); it will enable students to see beyond narrow institutional perspectives in the development of resources, possibly contributing to a reduction in the creation of resources that are not properly imagined for reuse by others; and, perhaps most importantly, it will allow students to experience alternative environments for the use and production of DH resources, building not just their skills but their networks, and expanding their imaginations for how they might use these skills in the future. Incorporating contexts such as research infrastructures into DH pedagogy can therefore go beyond the call that “the sage must step off the stage and circulate in real and virtual realms” (Saklofske 319) to a new theatre of learning in which many students circulate with many teachers, working together to deliver something in the wider context of infrastructure provision. Under such a vision, learning will focus not just on DH or even on a discipline in which a student or researcher seeks to use DH methodologies (a distinction already made in Cordell, 2016), but also on how these practices engage interdependent communities of practice with intersecting concerns. As Diane Jackaci stated in her keynote talk at the CSDH/SCHN 2016 conference in Calgary, the traditional model of having a single instructor (perhaps accompanied by a teaching assistant) doesn’t work for DH courses, and needs to change to reflect the complementary skillsets that different experts can bring through an evolving model that allows work to expand (Jackaci, 2016).

Needless to say, not all skills development takes place in the context of dedicated institutional spaces. Research into how and why researchers in the digital humanities acquire the skills they need has already shown that this process is more often than not opportunistic, self-directed or based on personal connections, and need-driven, invoking the digital humanities’ strong and enduring tradition of peer learning, which has been identified as the most desirable and effective way digital humanities skills are transferred (Antonjevic, 2015).

This peer-instructed approach is not without its challenges, though, as it draws upon the temporal resources of an academic, which as Antonjevic notes, is a scholar's most precious resource. Where peer-instructed learning is not an option, often it is the institutional library that steps in to deliver more formal training, but take-up of these types of workshops is often disappointing (ibid.). Instead, it seems that word-of-mouth is one of the main ways in which scholars at all stages in their career learn about developments in their field, including new techniques that can be learned, through mailing lists, conferences and face-to-face workshops (Antonjevic, 2015; Garnett and Papaki, forthcoming).

In all of the above contexts, Research Infrastructures such as DARIAH have an important role to play.

Digital Transferable Skills for Early Career Researchers

Following the Bologna Process, universities and policymakers across Europe began investigating ways of developing a skillset among graduates from higher education programmes, in particular those in which research is the major component of the assessment. Similar to the US model of "taught PhDs" whereby PhD candidates undertake some taught modules as part of their training, European universities began to develop transferable skills programmes that could complement the scholarly practice of early-career researchers in any discipline (Eurodoc, 2004). In 2005, the Salzburg Principles resulted from the Bologna seminar on "*Doctoral Programmes for the European Knowledge Society*" in which over 300 delegates devised 10 key principles for doctoral education. These were reviewed at a second seminar in 2010.

Within Ireland, for instance, this culminated in the publication and adoption in all universities of the *PhD Graduate Skills Statement*, published initially in 2008 by the Irish Universities Association 4th Level Network which was comprised of Deans of Graduate Studies and Graduate Studies Officers from Ireland's universities. This was then updated in 2015 in the 2nd Edition of the Graduate Skills Statement, published once again by the IUA. Within this skills statement, there was acknowledgement of know-how and skill-range that enabled students to "demonstrate a significant range of the principal skills, techniques, tools, practices and/or materials which are associated with a field of learning; develop new skills, techniques, tools, practices and/or materials." (IUA, 2015, p6), and to "critically analyse and synthesise new and complex information from diverse sources", yet there was no explicit discussion about skills that require digital approaches or digital data. It is important to note that these skills statements were designed to be universal across both STEM and ASHH disciplines.

In the latter half of this decade, though, focus has shifted towards explicitly recognising digital skills across all disciplines. Within its 2018 Skills Report, Eurodoc specifically mentioned skills relating to 'Digital' competencies, which included:

- Information accessing and retrieval
- Information presentation and visualisation
- Information processing and exchange
- Programming
- Software usage and development

(taken from Eurodoc, 2018, p4)

These skills on first glance could be considered specific to the computer sciences and those subjects that include coding and software within their practices. However, nestled elsewhere within this same report were the “cognitive” skills of abstraction and creativity; critical thinking; and analysis and synthesis, as well as the “research” skills that included interdisciplinarity; open access publishing; and open data management (ibid, p4-5), all of which are part of DH scholarly practice.

This movement from an implicit definition of transferable digital skills to a more explicit one shows not only an increased recognition of their place within society but also of their place within academe as a whole -- and not just for the “digital” scholar. This therefore provides an opportunity for Research Infrastructures to work with Graduate Education officers within HEIs to identify ways in which RI training can be included in transferable skills offerings.

This is why, DARIAH, specifically, should consider ways in which it could strengthen its position as an advocate and service provider of transferrable skills beyond the humanities.

RIs and DH training in the humanities

Just as the humanities disciplines and their methods are diverse and therefore difficult to define simply and uniformly, so also are research infrastructures (or RIs) developed according to many and varied models. RIs have been defined in many different ways in terms of their components, functions, and purposes by many different actors, in policy, theoretical and practical terms. Although the visions these many definitions present are also, by default, highly diverse and at times even contradictory, the one thing they seem to converge upon is the nature of RIs to enhance the activities of a broad base of researchers, enabling a more efficient and effective creation and transfer of knowledge.

This said, many of the individual definitions one finds maintain at least a figurative association with the conceptualisation of infrastructure as something heavy, physical and durable, such as the facilities built to serve research communities such as high-energy physics, or the storage of and access to structured data resources such as are used in macro-level population research. In this context, it may seem surprising that, in spite of the recognised heterogeneity of RIs, little consideration of training and education takes place within them. Some of the reasons for this lie in the relationships between universities (as organisations delivering teaching and research) and other forms of research performing organisation (RPO), including research infrastructures, a differentiation that is very distinct in

some countries (such as France or Italy) and not a consideration at all in others (such as the UK and Ireland). As this model has given rise to a perception that education and accreditation of early career researchers is a role for educational institutions only, research infrastructures seldom possess the kinds of specialised procedures, staff, resources and expertise to deliver formal educational programmes. Indeed, it is the lack of this layer that most distinctly differentiates activities of the research infrastructures, and many other forms of RPO, from those of the more familiar academic context.

This gap can be seen in a number of the practices of research infrastructures. A 2016 survey of user needs assessments undertaken by RI and RI projects addressing the skills development needs of their users or potential users came to the following conclusion: “The most striking observation is that research infrastructure projects seldom strategise or theorise explicitly about their training interventions, and how they interact with the wider environment of digital humanities.” (Edmond et al., 2016) In fact, with one exception (that of the explicitly training-focussed #dariahTeach project, described below), the many RIs and RI projects surveyed would, in spite of explicitly featuring training activities in their workplans and communications, focus almost exclusively on a definition of skills that reached only as far as an awareness of the specific tools the RI was developing and/or deploying. Any further bridging or boundary competences that might have been relevant seemed to fall very much out of consideration.

As these organisations consolidate, and their role in the research ecosystem becomes better understood, policies and practices are beginning to shift, however. Research infrastructures are rapidly becoming aware not only of the kinds of knowledge they create, but also of the distinct learning opportunities they can offer, very much along the lines of the idea of acculturation discussed above. The drivers for this shift are many, and include both internal and external, top-down and bottom-up impulses. For example, from the perspective of the European Commission, increasing emphasis within the consideration of the sustainability of RIs is being placed upon the need to having the right people with the right skills in the right places at the right time (ESFRI, 2017; European Commission, 2017). Furthermore, as these very researchers come to take up posts as facilitating or enabling capacity within RIs (Edmond, 2019), the career paths and perceptions they introduce regarding the researcher-infrastructure relationship have begun to shift attitudes from within. This shift in priorities also leverages the RIs’ emphasis on the mobility of people and ideas, in particular in niche areas. In total, these many forces are fostering a growing awareness among research infrastructures of the importance of developing and sustaining human capital.

A number of the specific responses that have emerged from humanities-focussed RIs to the need to foster skills development at a higher level than previously are discussed below. But it is important to clarify that for all of their increased commitment to making the acquisition of skills accessible for new cohorts of scholars, the RIs still do not engage in formal certification of these skills, for the reasons outlined above. While many researchers are adequately served by this differentiated landscape, and do indeed simply want to understand their tools in order to carry out their analyses, others might see the wide variety

of opportunities within DH as more integral to their career paths and curricula vitae. For these individuals, a pathway that could combine RI-based knowledge and skills and formal accreditation would be more attractive, and yet this is where a major gap exists.

Case Studies

In the following sections, we will analyse three training and education initiatives in the DARIAH ecosystem and their potential for being embedded in the educational offerings of higher education institutions: #dariahTeach, PARTHENOS Training Suite and DARIAH-Campus.

#dariahTeach

#dariahTeach (<https://teach.dariah.eu>), a full Moodle-based environment for DH courses and workshops tuned for use in university courses so as to strengthen alliances and foster innovative teaching and learning practices (Schreibman et al. 2016), was launched in March 2017 as part of an Erasmus+ funded project.

#dariahTeach was developed with sharing, reuse, and localisation (in terms of language and examples) as key design objectives. The teaching materials, as well as the implementation of the platform, were developed with three target audiences in mind:

1. instructors teaching Digital Humanities, particularly, but not exclusively, at a postgraduate level who can use these materials as appropriate to their own institutional settings and learning outcomes;
2. instructors in other disciplines can draw on and integrate these materials into more subject-based teaching and;
3. students who are not at institutions that have DH expertise can develop the skills and methods, as well as understand the theoretical basis, to engage in digital humanities research.

#dariahTeach “courses” (of proposed 5 and 10 ETC equivalents) and smaller “workshops” (without ETCs attached to them) are designed at the intersections of theory and practice providing ample opportunities for students to develop fundamental skills necessary to create, implement and engage with scholarly digital objects (eg textual, audio, video, 2D, 3D) as well as the tools, services, methods and technologies relevant to a wide range of disciplines within the Digital Humanities. At the same time, the offerings are designed to contribute to the development of critical thinking about areas such as digital preservation, and the exploitation and transformation of cultural heritage as a vital educational goal in a pluralistic, reflective society.

The content is tagged using the terms from the NeDiMAH Methods Ontology (NeMo), a CIDOC-CRM compliant ontological model which explicitly maps out the interplay of factors of agency (actors and goals), process (activities and methods) and resources (information resources, tools, concepts) in Digital Humanities scholarly processes. This language-

independent method of describing and classifying work processes in the field of Digital Humanities was developed by the "Athena" Digital Curation Unit (DCU), a #dariahTeach partner, and the NeDiMAH Ontology Working group in the context of an ESF research networking program on understanding Digital Humanities in practice. Having a means to formally describe the content of #dariahTeach courses while helping users discover training resources that best match their learning goals is an important step in the push toward creating DH training materials with richer, more consistent metadata and training platforms with efficient cross-linking and navigation possibilities.

#dariahTeach Course 2: *Text Encoding and Text Encoding Initiative* as a teaching aid in workshop settings at Trinity College Dublin

This case study seeks to evaluate #dariahTeach Course 2: *Text Encoding and Text Encoding Initiative* as a teaching aid. The evaluation is based on the use of the course materials in a one-shot workshop entitled "Working with Texts in the Digital Age: Digital Scholarly Editing and TEI". This workshop is part of the Digital Scholarship and Skills Workshop Series coordinated and facilitated by staff of the Trinity College Dublin Centre for Digital Humanities.

In September 2017, the Centre for Digital Humanities introduced the Digital Scholarship and Skills workshop series in response to a growing demand across campus, and particularly within the Arts and Humanities, interested in developing a literacy of and/or integrated Digital Humanities tools, methodologies and practices into their research. The primary objective of the series was to introduce participants from a diverse range of backgrounds to digital research-related skills and tools with a specific focus on developing a greater understanding and appreciation of how the digital is shaping and influencing scholarship. The workshop series is open to faculty, staff, researchers and postgraduate students from across campus. The module comprises a suite of workshops to support the development of the critical understanding and practical skills needed to make best use of digital research tools in the context of Humanities research. Each term the content focuses on four skill-building tracks, some more theoretical, others focussing on key competencies and environments for digital research. The workshop series is now in its third year. In the years one and two, the workshops were four hours long. In the third year there was a change in the structure of the workshops and they were reduced to three hours to better accommodate the needs of faculty and staff.

In the first and second year, it was a struggle to fit the full course content into four hours, with insufficient time for the practical aspect of the workshops. When the workshops were reduced to three hours the "Working with Texts in the Digital Age: Digital Scholarly Editing and TEI" was offered across two workshops totalling six hours with great success.

In each of the three years, the #dariahTeach Course 2: *Text Encoding and Text Encoding Initiative* has been used as a teaching aid in the workshop titled "Working with Texts in the Digital Age: Digital Scholarly Editing and TEI". The workshop description is as follows:

This workshop is designed to introduce participants to the theories, practices and methods

for encoding digital text in the Humanities. It provides an introduction to markup languages, XML, the infrastructure of the Text Encoding Initiative (TEI) Guidelines, and the encoding of common textual phenomena. Participants will have an opportunity to apply the basic elements of TEI-XML to encode a literary text using the oXygen XML Editor. The workshop combines lectures and discussion with practical hands-on exercises. No previous experience with digital text is assumed

The #dariahTeach course was the primary resource used in preparing this workshop material and was selected because the workshop facilitator was already familiar with the material having participated in user testing of the #dariahTeach beta content. The aim of Course 2: *Text Encoding and TEI* is to introduce learners to the theories, practices and methods used for encoding texts in the Humanities. Other sources for the workshop include A Gentle Introduction to XML (<https://tei-c.org/release/doc/tei-p5-doc/en/html/SG.html>) and W3schools.com XML Tutorial (<https://www.w3schools.com/xml/>).

The #dariahTeach course consists of the following material:

- text and figure-based course content
- practical examples, both in-text examples of encoded documents and screencast video tutorials.
- video content, including the aforementioned tutorials and discussions of course content such as the Markup and Metadata video (<https://youtu.be/E7-g17oL7w0>).
- quizzes
- practical encoding exercises
- other resources including “External Links” and “Further Reading” lists.

The quizzes were not used in the workshop. Other resources and bibliographies were prepared by the workshop facilitator. The videos were used in the first year but they were not suited to a classroom teaching scenario and they were therefore dropped from the workshop content in the second and third years (see below). The remaining materials were incorporated into the training in the following ways:

Text and figure based course content	Used in the preparation of workshop PowerPoint and handouts.
Practical examples	Used in the preparation of workshop PowerPoint
Practical encoding Exercises	Used in the practical hands-on section of the workshop

We received the following feedback:

- The text and figure based course content was most useful in the preparation of workshop PowerPoints and handouts.
- The preparation of a slidedeck may be useful for educators and trainers who want to use the course material in the classroom as opposed to the full-blown Moodle

installation. Any such slidedeck would have to be flexible, allowing for the addition or omission of material as appropriate to the workshop content.

- The practical examples were used successfully in the preparation of workshop and PowerPoint and handouts.
- Practical encoding exercises were deemed the most useful of the course material because they included clear, detailed step-by-step instructions that individual students could follow directly in class. Step-by-step instructions were also seen as a major time saver for the instructor because the preparation of similar exercises by the workshop facilitator would have require a significant time investment.
- Video content has received mixed reviews. The videos were used in the first year but they were not suited to a classroom teaching scenario and they were therefore dropped from the workshop content in the second and third years. The two main challenges with the videos were low audio quality and their unsuitability for a large screen. The use of video content does not allow for free discussion and may not be suited to workshops such as these, but their usefulness to individual students outside of class should be evaluated separately.

PARTHENOS

DARIAH was one of the beneficiaries of the H2020-funded PARTHENOS project (Pooling Activities, Resources and Tools for Heritage E-research Networking, Optimization and Synergies). One of the major outputs of this project was the provision of training and education content around common Digital Humanities and Research Infrastructure-based research.

Evaluating contemporary training provisions

In order to identify the key audiences for PARTHENOS training, and the direction PARTHENOS should take in its training provisions, a survey was conducted to determine a pattern of training provision among 12 major digital humanities-based projects and Research Infrastructures throughout Europe (ARIADNE, CENDARI, CLARIN, DARIAH, DASISH, EHRI, IPERION, DCH-RP, PERICLES, NeDiMAH, AthenaPlus and DigCurV).

Through desk research and a series of targeted questionnaires, the following main points were found in relation to the preferences and self-identification of training needs:

- Researchers who are inexperienced with digital techniques “don’t know what they don’t know” thus they do not see the necessity of guided training programmes and do not articulate training needs.

- There is a tendency towards training that involves face-to-face interactions, in particular small group workshops and hands-on training courses that allow for 'learning by doing'. However, it was also found that these can take a lot of time to coordinate, and also to attend (e.g. summer/winter schools).
- Those who do undertake studies in Digital Humanities often do so alongside a 'traditional' humanities subject.
- Distance / online learning requires considerable motivation from the student, and often works best when accompanied by webinars or other event-based online training.
- Training needs tend to focus on existing infrastructure provisions in terms of tools and services, and not on more generic-level issues. One of the projects surveyed indicated that offering training on broad topics was not successful for them, however.
- How training provisions are disseminated and advertised can have an impact on take-up. Often finding the right channel can make all the difference.

(Drude et al, 2016)

Identifying audiences and meeting training needs

With these lessons in mind, PARTHENOS developed the PARTHENOS Initial Training Plan (Edmond et al, 2016), in which four main audience types were identified, each with their specific training needs:

1. researchers;
2. content specialists in CHIs;
3. technical developers/computer scientists; and
4. managers of institutions and projects

The two groups at whom the bulk of the initial training was aimed were the researchers and content specialists in CHIs. Three core modules were developed to meet the needs of these groups, with increasing levels of expertise required for each:

- Introduction to Research Infrastructures (the beginner level)
- Management Challenges in Research Infrastructures (the intermediate level)
- Collaborations between Research Infrastructures (the advanced level)

Following this initial phase, further modules were included that were more subject-specific, including topics such as research data management, formal ontologies, and citizen science. By the completion of the project, seven modules were launched on the PARTHENOS

Training Suite, along with the recorded outputs from five subject-specific expert-led webinars.

Embedding training in Higher Education

In addition to developing training materials within PARTHENOS, the application of these training materials was also something that the project wanted to evaluate. In order to do so, Task 7.4 of the PARTHENOS project, "Definition of Higher Education Curricula" analysed current experiences in higher education concerning digital humanities and digital cultural heritage and established a reference curriculum for such, at undergraduate, postgraduate and doctoral level. It produced a final report D.7.5, that described the state of the art of Research Infrastructure-based training within Digital Humanities courses throughout Europe, along with recommended improvements, entitled '*Embedding PARTHENOS Training into Higher Education Curricula: Report on the Activities of Task 7.4*' (Edmond et al, 2019). The approach taken involved a combination of a) desk research and b) questioning of participants in specially-organised workshops and roundtable sessions. The latter approach included two 'Course Provider Workshops', bringing together course providers from across Europe to discuss their training practices in digital humanities, and how PARTHENOS could assist them in acquiring skills they might need, and materials they can use in their teaching practices. The authors also conducted an online survey among course providers and graduates of courses, in order to establish the reasons for students taking the course, what worked, and what didn't. To select the university contexts being analysed, the PARTHENOS team reviewed the courses on offer throughout Europe, using the DARIAH-CLARIN DH Course Registry.

The authors found that:

- over half of the participants were keen to see more reusable training materials on Research Infrastructures.
- practitioners in the Cultural Heritage Institutions (CHIs) experience barriers that prevent them from accessing higher education training, particularly if they are unable to easily justify it to their line managers.
- there is still a need for training around concepts and issues within DH, rather than only for the provision of technical skills, such as coding. Despite this, though, there is still a balance to be made between those who do not want to do any coding, and those who are disappointed when training in DH doesn't include coding.
- some course providers draw on resources from RIs such as DARIAH and CLARIN, some from books and online tutorials. Yet for the most part, course providers draw on their own research or team resources.

(Edmond et al, 2019)

Crucially, this deliverable also provided the opportunity for the practical integration of training material produced by RIs into a Higher Education module: specifically, the recently-developed Research Data Management module at King's College London. This module incorporated elements from the PARTHENOS Training Suite, particularly from the "Introduction to Research Infrastructures" and "Manage, Improve and Open Up Your Research Data" modules. The module was attended by around 40 students, mostly international (see the case study below).

The conclusions of PARTHENOS D7.5 were as follows:

- internships and practical work are highly valued where it is possible to include them;
- Digital Humanities courses need not emphasise a mastery of coding, but should not exclude it either; and,
- reusable content that allows for integration of the materials as appropriate to the course is welcome among course providers.

PARTHENOS Training Suite in the classroom at King's College London

As part of PARTHENOS's work in developing training materials, there was a need to analyse their practical application in a Higher Education environment. In order to do so, the PARTHENOS team worked closely with King's College London to contribute to a new "Research Data Management" module to be rolled out in Autumn 2018. The instructor on the module was Dr. Kristen Schuster, a member of the PARTHENOS team behind some of the training materials that were developed. This meant that Kristen already had good knowledge of what was available in the training Suite, and what she could make use of in her module at KCL.

The module introduced postgraduate students to the core concepts and practices of research data management (RDM). Lecture themes and seminar activities revolved around three educational aims:

1. discuss the role data management plays in digital humanities work and research;
2. evaluate the foundational concepts and practices necessary for data management;
3. apply best practices for selecting and implementing technologies, policies and workflows that support data management.

Over the course of ten weeks, students developed strategies for discussing and defining data, institutional repositories and research infrastructures. While gaining theoretical knowledge in the first five weeks of teaching and practical skills in the last five weeks, students used best practice guidelines and models to develop research data management strategies.

The PARTHENOS training materials used throughout the module included video lectures with accompanying downloadable presentation slides that were also made available to the students, shorter videos around basic concepts in Research Infrastructures, and links to content in sections of the “Manage, Improve and Open Up your Research Data” PARTHENOS module and the “Introduction to Research Infrastructures” module, which was given as required reading in preparation for lectures in classes. The students participating in the course were mostly non-native English speakers, and many of them came from outside Europe. During assessment and practical work students most frequently referenced PARTHENOS materials that addressed research infrastructures (for example training videos such as “What IS Research Infrastructure?”, and the accompanying slides). This was due in part to the essay prompt the students were given, but it is also likely students found the PARTHENOS materials on RIs relevant based on their emerging understanding of RDM as a collaborative and ongoing negotiation of researcher, discipline and institutional needs.

Further evaluation of the module revealed that the online written content proved very popular, although the video content was less popular. The authors proposed that this may be attributed to language barriers: written content allows for more time to digest and fully understand the material. Video content, while more dynamic, does not allow as much time for comprehension, particularly if the topics under discussion are complex, or the user is not so familiar with spoken English.

DARIAH Campus

DARIAH-Campus (<https://campus.dariah.eu>) is both a *discovery framework* and a *hosting platform* for DARIAH and DARIAH-affiliated offerings in training and education.

The goal of DARIAH-Campus is to widen access to open, inclusive, high-quality learning materials that aim to enhance creativity, skills, technology and knowledge in the digitally-enabled arts and humanities.

Unlike #dariahTeach, for instance, which is tied to a Moodle-based content management system, or the PARTHENOS Training Suite, which was published on an adapted WordPress-based blog, DARIAH-Campus learning resources are:

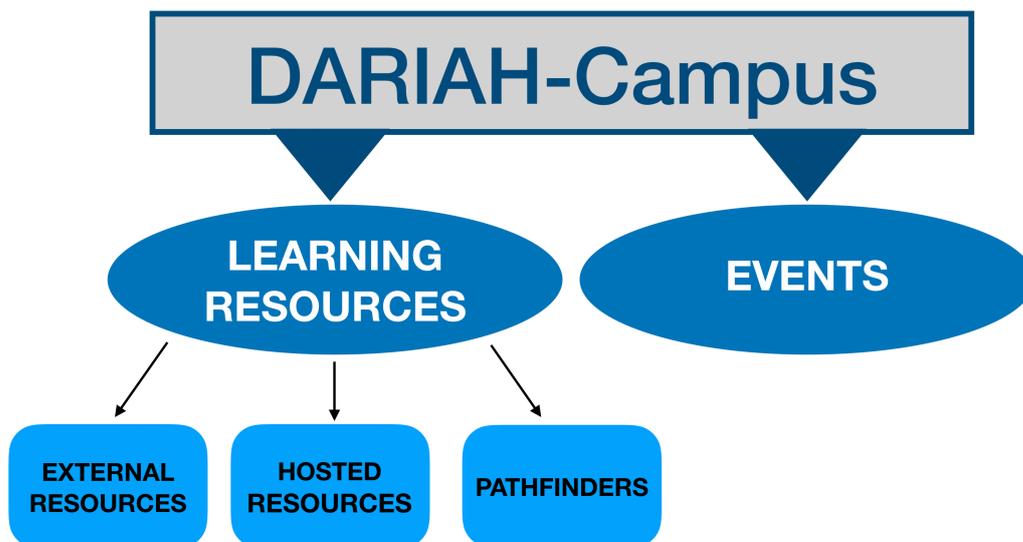
- written in Markdown, a lightweight markup language with easy-to-learn, plain-text formatting syntax;
- hosted on GitHub, a popular repository hosting service based on the open-source version control software called git;

- delivered to the user via a user-friendly Gatsby-based overlay website which provides a set of useful features such as consolidated search, tagging by topics, categorization by sources etc.

DARIAH-Campus started as a pilot project exploring different ways of capturing and consolidating DARIAH learning resources within DESIR. The beta version of DARIAH-Campus was released on November 6th, 2019 at the DESIR Event in Zagreb.

The architecture of DARIAH-Campus marks an important departure for DARIAH learning resources: instead of relying on platforms that in one way or another “lock in” their content, DARIAH-Campus provides access to both the Markdown source (via GitHub) and its generated HTML view (via the DARIAH-Campus website). Because of its plaintext syntax, Markdown content, hosted and versioned in a digital repository, should be easier to reuse and repurpose than a fully generated website.

In a further departure from the initiatives such as #dariahTeach and PARTHENOS, DARIAH-Campus seamlessly integrates references to existing resources and those that are hosted by DARIAH-Campus itself.



External resources

One of the functions of DARIAH-Campus is to act as a discovery layer for existing learning resources, which includes curated links to lessons, courses, tutorials and other materials in the places where they ‘live’. Currently, we link to resources that a) have a connection with DARIAH-EU (including #dariahTeach and PARTHENOS) or the national nodes; b) are contributions from our members; and/or c) have a connection with the DARIAH Working

Groups. We only link to external resources that are openly available for use and re-use in order to promote and uphold the principles of open science.

An example an externally hosted resource can be seen here:

<https://campus.dariah.eu/resource/citizen-science-in-the-digital-arts-and-humanities>

Hosted resources

DARIAH-Campus hosts and version-controls new online learning resources designed for use both by online users and in future face-to-facing training events. Hosted resources include, but are not limited to: training courses, individual lessons, and/or tutorials. These hosted resources cover topics and concepts related to (digital) humanities scholarship, and range from very targeted courses around a particular tool or methodology, such as GIS or TEI, to more universal issues related to current humanities scholarship such as Open Science, or Research Data Management.

To view an example of a hosted resource, click here:

<https://campus.dariah.eu/resource/xpath-for-dictionary-nerds>

Pathfinders

There is an overwhelming number of learning resources available online, so much so that it is sometimes quite difficult for learners to know where to start. In such cases, DARIAH Pathfinders come to rescue as a specially-produced, humanist-friendly guides on a variety of topics relating to digitally-enabled research and teaching. A Pathfinder is a 'hybrid' resource which is written for and hosted by DARIAH-CAMPUS, but which introduces and contextualises a number of other resources, including those that are hosted externally and those that extend beyond those created by members of the DARIAH network.

You can see an example of a Pathfinder here: <https://campus.dariah.eu/resource/dariah-pathfinder-to-data-management-best-practices-in-the-humanities>

Events

The ephemeral nature of training events such as webinars, lectures series or training workshops can be tricky to reproduce in an online environment, yet they are a vitally important part of training and education. DARIAH-Campus offers a format that captures live training events such as these to enable learners and trainers to revisit and reuse the outputs of such events. We do this by hosting documentation from these events, which can include programmes, slides, videos, speaker biographies and much more. For this, we have designed a special workflow and a template to compile and structure the content in a learner-friendly way. For an example of a captured event on DARIAH-Campus see:

<https://campus.dariah.eu/resource/ws2016>

DARIAH-Campus as a publication venue for PhD Students

Because DARIAH-Campus is a resource whose beta version was launched only recently, it was beyond the scope of this deliverable to include a full-blown case study on it. It is important to mention, however, that the local organizers of the DESIR Workshop at the University of Neuchatel, which assembled a group of young Swiss researchers interested in sharing DH workflows and learning about data management in December 2019, proposed a unique way of utilizing DARIAH-Campus as a publication venue. The Event Capture template (described above) will be repurposed in lieu of an overlay journal to publish short data papers by workshop participants next year. The papers will be deposited in institutional repositories such as HAL (a DARIAH-FR contribution) or Zenodo, in accordance with best-practice examples, whereas DARIAH-Campus will provide contextualization, information on each author, abstracts etc.

The DESIR workshop in Switzerland has demonstrated that close collaboration between RIs such as DARIAH and Higher Education Institutions such as the University of Neuchatel can lead to unexpected results. DARIAH-Campus was designed to serve as a discovery framework and a hosting platform for DARIAH's training materials, but our users in the university setting discovered an even broader potential of the platform: to serve as a conduit for practicing what we preach, i.e. as a service which can not only be used by students to learn, for instance, about data management workflows, but also as an infrastructural node which can be used to help young researchers enact some of the best practices in our field: publishing papers in open access, providing data samples, collecting useful metadata and sharing content produced for training events by the trainees themselves.

Conclusion

Taking the challenges of DH pedagogy and the experiences of the initiatives discussed above into consideration, there are some key actions that DARIAH can take in order to ensure that the learning resources it develops are both suitable to a Higher Education context, and more importantly, relevant. This deliverable therefore recommends the following action points.

- DARIAH should establish an active educational partnership network in order to validate a new approach to the skills needs of humanities students and researchers, looking beyond the frame of what is currently available in the context of formal educational programmes

For a new approach to be developed, validated and adopted, DARIAH should develop and nurture partnerships with HEIs to form an active partnership network that ultimately ensures improvement in the training materials developed by RIs to ensure they remain relevant and effective. ERASMUS+ has been identified as a funding framework within which such a robust network of RI's, teachers and students in university-based programs, policy makers and employers could emerge.

- DARIAH should develop a curricular model and, if possible, an internship program, to enable fluid exchange of knowledge and students between university programmes and the applied contexts of the research infrastructure.

Higher education can benefit from the skills and experience generated within research infrastructures by attempting to include a strong element of acculturation in their formal training activities, defined as bridging competencies to use digital humanities skills in an applied context.

Work within both #dariahTeach and PARTHENOS confirmed a demand for reusable content that allows course providers to integrate the materials as they see fit within university programmes, and demonstrated this by the case studies described above in which #dariahTeach and PARTHENOS resources were used in HE classroom settings. Research Infrastructures can further this by developing a systematic approach to monitoring the use of any training materials by course instructors, and feeding this back into their development. Research Infrastructures often have extensive networks of communities and researchers, that the RI can make use of to gather feedback. DARIAH, for example, has several member and partner institutions with considerable expertise in the creation and use of online learning materials. DARIAH can collaborate with them to develop relevant materials, and then trial their use in online curricula to support online and distance-learning course providers. In turn,

DARIAH can then make use of this collaboration to produce resources that are better suited for online learning.

- DARIAH should continue to create and maintain essential filtering and contextualising layers for training materials to coordinate and enhance open educational resources.

Research Infrastructures should work with members and co-operating partners to develop new online training materials, and to ensure that these resources are appropriate for use in a structured HE curriculum context. Within DARIAH, the recent development of DARIAH-Campus, which aimed to “capture and consolidate” DARIAH training materials will assist with this aim by making the materials more discoverable, higher quality, more user-friendly, and increasingly reusable.

- DARIAH should aim to apply and test its learning resources in different HE contexts in order to profit from unforeseen synergies and unexpected outcomes.

The transformation of the DARIAH-Campus Event Capturer template into an experimental overlay journal for young researchers participating in face-to-face training events was an unexpected outcome of the DESIR Workshop at the University of Neuchatel, as described above. Infrastructural nodes and services such as DARIAH-Campus or the DARIAH Marketplace may profit from increased interaction with HEIs, which will not only result in better quality control and improved feedback regarding the existing DARIAH resources, but also, potentially, in the adaptation, transformation and further reconfiguration of the resources themselves. Research infrastructures, while stable, cannot remain static.

- Building on currently identified needs, DARIAH should develop foresight models to predict future needs within the Higher Education sector.

While looking at the current needs of researchers at all stages in their career is important, it is equally important to also look beyond the frame of what is currently available in the context of formal educational programmes. This can be done by building on the existing knowledge about user needs as identified in both this deliverable and DESIR D7.1, then using this to undertake and document foresight studies into future and emerging needs within the Higher Education sector.

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