Soft skills in hard places: the changing face of DH training in European research infrastructures

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Introduction

Research Infrastructures are becoming an increasingly distinct presence in the landscape of the digital humanities, creating unique research ecosystems that interact with, but remain distinct from, the traditional university-based ones. It is a research sector still very much in the process of defining itself, however, in particular in the arts and humanities, not only in terms of how exactly infrastructures support research but also in terms of how a word with such "hard" connotations (conjuring up images of roads and bridges) can encompass the many "soft" resources and skills, from data to know-how, that we now recognise as a part of infrastructural provision for research in Europe. This tension is already present in how research infrastructure is defined, with some camps preferring to fall back on long lists of elements infrastructure may or may not comprise, such as data, services and tools, while others remain more theoretical, placing them in the role of "mediating" (Badenoch and Flickers, 2010) or "below the level of the work" (Edwards et al, 2007: 17). Regardless of how we conceptualise it, however, infrastructure is undeniable as a rising presence, with a growing impact on how research is conceptualised and carried out, how research results are communicated and shared, and how the potential scale of a humanities project can be conceptualised.

For the purposes of this discussion of infrastructural pedagogy in the digital humanities, we will take three key aspects of the semantic debate surrounding infrastructures as central to a working definition. First, research infrastructures focus on providing some sort of high-level supporting, but not directive, layer in the research ecosystem. In this sense, email would be too generic, specific research tools, too limited or specialised. Second, they are at least somewhat removed of the known university-based administrative structures, which generally serve dual

roles of supporting research and teaching. Finally, and perhaps obviously, the research these initiatives seek to support focuses on questions of humanities or cultural research.

Drilling down a further level, this paper takes its specific frame of reference from the collective experiences of three research infrastructural communities, of which the parent organisations share the same legal status (or aspirations to that status) of European Research Infrastructure Consortia (or ERICs). Working together in a knowledge sharing cluster known as PARTHENOS, the DARIAH, CLARIN and E-RIHs research infrastructures (as well as their affiliated projects, such as CENDARI, EHRI, ARIADNE, and IPERION CH) present a distinct context for infrastructural provision: as independent legal entities comprised of national members, with distributed localities and a focus on building communities, services, data and, ultimately, knowledge complementary to but outside of the national, local and institutional silos.

The paper will embed a presentation of PARTHENOS' work in a theoretical discussion of the role of research infrastructures in the development of skills and careers in the digital humanities. It will give an overview of some of the practical interventions the project has made to address the thorny issues of developing training and education programmes outside of the academy, including awareness raising, foresight work, embedding in higher education, partnerships and accreditation. Working in concert with its constituent partners, the PARTHENOS team is testing the potential for infrastructural knowledge, for its transmission as materials for self-directed use by independent learners and trainers, and for its capacity to be integrated in the programmes of universities and professional organisations alike. Through this programme of engagement PARTHENOS will not only bring an extended horizon for training to research infrastructures and their users, but to all of digital humanities.

Theories and Experiences of DH Training

Ideally, the relationship between independent European research infrastructures and university-based researchers should be fully complementary and to mutual benefit. A researcher, wherever she may be based, should be able to access support from an infrastructure, and the infrastructure should in turn be able to draw upon such users to shape and enrich its provision. Although gaps exist in communication and mutual understanding of mission, for the most part, this is the case. There is one element in this landscape of symbiosis that has steadfastly remained based within the universities, however: that is the manner in which new generations of researchers are formed, through training and education. Some of the reasons for this lie in the need for specialised procedures, staff, resources and expertise to deliver formal educational programmes, a layer of provision that research infrastructures seldom have. Indeed, it is the lack of this layer that most distinctly differentiates activities of the research infrastructure from those of the more familiar academic context.

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, by which 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 is has been theorised, work on DH pedagogy also tends 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 to something natural and expected, but we should not forget that a classroom experience, not matter how well constructed, exists within a particular 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) and embodiments of a 'political vision' (Simon, 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).

Geoffrey Rockwell, who had observed already in 2010 that in the digital humanities "there are few formal ways that people can train." (Rockwell, 2010, blog), 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." (Rockwell and Sinclair, 2012: 177)

The chapter focuses of this third path, because many of the 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." (ibid: 182)) are more matter of practice, the 'how' rather than the 'what' of what gets done, and very much the kind of practices that are best viewed as a 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.

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, 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, 2012: 319) to a new theatre of learning in which many students circulate with many teachers, working together to deliver something in a real service context. Under such a vision, learning will focus neither about DH nor even about the discipline they seek to use its methodologies to investigate (a distinction already made in Cordell, 2016), but about an interdependent community of practice with intersecting concerns. As Diane Jackaci stated in her keynote talk at the [CSDH/SCHN](#) 2016 conference at Congress 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)

Training within Infrastructure Projects

The idea to bring infrastructural developments closer to the formal training of digital humanities students does not start from a zero baseline, for it is not true infrastructures have no track record of offering training opportunities. What is different is the fact this training has historically been founded upon a relatively narrow conceptualisation of the added value of the infrastructural space for creating and sharing unique knowledge. As such, projects and platforms would traditionally create materials to assist users approaching specific tools developed or hosted by the infrastructure, serving a very narrow conceptualisation of the user and his or her needs.

There has been an increasing number of examples of the infrastructural community expanding their activities to fill spaces less easily addressed by traditional, formal, course- and institution-based training contexts, however. Hands-on training with specific collections or objects, or using transnational access to build skills, for example, are mechanisms that have been developed to great effect by infrastructures, as has the model of partnering with other organisations to deliver credit-bearing programmes. These are mechanisms that have arisen in part because of the opportunities that exist, for example, when researchers work in close proximity to specific scientific instruments, as in the fields of cultural heritage and preservation,

but have also arisen as accidents of design. Many research infrastructure funding schemes include fixed elements drawn directly from the longer tradition of infrastructure development in the fields of science and technology, mechanisms that do not necessarily fit humanities modes of work or interaction.

Such programme remained largely ad hoc extensions of an originating user-support model of training. A review of the literature regarding infrastructural projects' approaches to user requirements (available as the PARTHENOS project's Deliverable 2.1[1]) shows that very few projects in this space actually formally theorise the training needs of their user communities (in spite of the fact that training is apart of what every project delivered). This gap leads to the conclusion that training is generally viewed in the narrow context of what a community member would need to draw value from specific services and tools, rather than from the broader perspective of the competencies he or she might need to fully comprehend and exploit the infrastructural space.

On the basis of the discoveries made through this analysis, the PARTHENOS project set itself a threefold challenge to first identify some of the branches of knowledge that were particularly well-developed within research infrastructure, and second to determine the audiences that would benefit from having access to this knowledge and finally to determine what channels were best suited to the transmission of this knowledge, and use them to facilitate access to this unique context for knowledge creation and transmission.

The PARTHENOS Approach

Overarching Principles

On reviewing the information gained through the desk research into user requirements, it became clear that in order to make sure we were meeting the needs of those engaged in DH training, we needed to devise some overarching principles on which we could frame the training provision we developed.

One of the stand-out issues surrounding training within Research Infrastructures was the narrow focus with which previous training devised by RIs tended to adopt. All too often, the training provided by RIs focussed on the tools and services that RI has developed. A wider, more holistic approach was, we found, lacking. Taking this into consideration, and also incorporating a stance that would take account of the variety of potential users to such a suite of training materials, the following four overarching principles were determined.

1. **The PARTHENOS Training Plan is targeted at users of digital humanities research infrastructure**

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[1] PARTHENOS Deliverable 2.1, available at
https://data.d4science.org/shub/872c6cd0-de35-4d7f-8dc7-94efa217eaa5

While we want to make sure we are addressing a somewhat wider reach than previous RI training programmes, there is a danger of spreading the training too thin by trying to incorporate all aspects of DH training. By expanding the focus but in a limited manner, we can make sure that we cover the theme of Research Infrastructure more comprehensively, but not try to be all things to all people.

2. **The PARTHENOS Training Plan will address two levels of user need: the 'need to know about' (awareness raising) and the 'need to know how to do' (skills building).**

One of the key barriers to the wider use of research infrastructures is a lack of awareness as to what exactly they do. Conversely, there are those who have been working in RIs for long enough not to need that kind of training, they want to instead move to information on 'how to'. This principle therefore helps us to identify audience types and audience needs.

3. **Although PARTHENOS is a research infrastructure project, we must conceive of our training interventions as relevant far more broadly than to researchers only.**

Again, in identifying our audience, it became clear that it was not just researchers who make use of RIs, but a large cohort of cultural heritage practitioners, software developers and data managers are also key to the ecosystem within an RI. The training developed therefore needs to address these needs, either ensuring that a training module incorporates all those needs, or focusses specifically on audience types.

4. **Given the resource restrictions within the project, PARTHENOS will focus on asynchronous delivery, 'train the trainers' approaches and partnerships with other projects and initiatives to attain maximum impact.**

There is already a good deal of DH training material already available (dariahTEACH, RITrain, to name just two). Therefore, by taking an approach that allows the training materials we develop to be used alongside these existing initiatives, we can enhance the training experience, and support the trainers in the field.

Audiences

As an infrastructure cluster, PARTHENOS is charged with deepening understanding of what infrastructure is and how common activities can be better aligned for maximal benefit to researchers between the communities that have built landmark research infrastructures at European level. Guided by the overarching principles listed above, the PARTHENOS training framework seeks first and foremost to make a distinction between research work that does and that does not engage with data and service infrastructures such as the PARTHENOS partners represent.

At the next level, the framework seeks to address the digital humanities not only as a set of domains, but also as a set of roles and actors. This approach was informed by work carried out by the DigCurv project (http://www.digcurv.gla.ac.uk/). In developing a framework for digital curation curricula, they identified three key audience types, which they referred to through 'lenses': **The Practitioner lens**, aimed at those working within CHIs and HEIs who deal with digital curation and information management on a daily basis; the **Management Lens**, aimed at those who are responsible for the running of CHIs and Digital Curation projects, and therefore require a different set of skills; and the **Executive Lens**, aimed at those working at a more 'umbrella' level, where they inform policy decisions, either within a CHI or HEI, or at a national level such as in government.

This approach from DigCurv looked at roles rather than levels of expertise to identify their audiences, and focussed on meeting the needs of that role. This approach appealed to the PARTHENOS Training Plan, as those same differences in roles are present within the RI environment. Cross-disciplinary similarities mean that, regardless of the level of expertise in a particular type of Digital Humanities community of practice, training needs can occur at any stage in an individual's career.

The audience types identified by PARTHENOS are therefore:

- Researcher Practitioner

- Content specialists in CHIs

- Technical developers/Computer Scientists

- Managers of institutions and projects

These four audience types serve as an initial focus for training, although it should be noted that in some cases, the audiences may overlap, depending on the subject matter.

Implementation

By reconceptualising a didactic system from the first principles of who might need digital infrastructure and what they might need to know or be able to do, PARTHENOS has been able to create bespoke training materials that draw from the uniques experiences within research infrastructures and the unique knowledge they create.

The materials exist within a simple but evolving framework, addressing experience levels from the novice to the intermediate and advanced levels. Modules are designed to build bridges

between potential users and the entire context of the research infrastructure and how they operate, answering fundamental questions about what resources are available and how they operate, through to much more fundamental explorations of the opportunities and challenges that exist in this environment, issues that even expert practitioners struggle to define and address.

'The Policymaker's Guide to Research Infrastructures' brochure

This brochure was created to provide an easily-accessible guide for those at the 'Managers of Institutions and Projects" level, as well as at the government and Senior University Administration level. This brochure was developed as a tri-fold leaflet, answering the question "Why Invest in Humanities Research Infrastructures?". Broken down into small passages of text, it addresses questions around why the Humanities need Research Infrastructure, how Research Infrastructures can help research teams within the Humanities to implement interoperability, sustainability and innovative methodologies that enhance the impact of research outputs (and in turn, how this translates to research outputs at the institutional and national level).

Phase 1 modules

The initial offering from the Training Suite seeks to tackle these issues of a lack of adequate knowledge transfer *out of* RIs at a macro-level. In 'Phase 1' of the training development, three key modules have been devised to address the needs of the audiences we have identified, while also ensuring that key issues within RI use, management, and further development are addressed.

At the 'beginner' level, we have an introductory module, entitled "Introduction to Research Infrastructures". This module introduces the basic concepts behind research infrastructure such as Interoperability, Methods and Networks, as well as some more fundamental elements such as metadata, knowledge representation systems and data standards.

At the intermediate level, we move on to 'Management Challenges within Research Infrastructures", looking more closely at the types of issues that may affect a project manager or principal investigator within an RI project, such as Sustainability of the RI once the funding cycle is complete, how to engage users of the RI, and identifying Audiences and Communication methods for the RI project.

Finally, at the more advanced level, and while assuming some expertise in the area of RIs, the "Introduction to Collaboration in Research Infrastructures" module moves beyond the scope of a single-disciplinary RI into how research infrastructures can combine effort with RIs in similar fields, or indeed how to bridge the gap between more STEM-focussed RIs and the

AHSS-focussed RIs. The module also takes a look at collaborations outside of academia, where RIs may seek to collaborate with Culture Heritage Institutions, for example.

The Training Suite

Each module within Phase 1 of the Training Plan is presented in full on the PARTHENOS Training Suite website (http://training.parthenos-project.eu/). This suite was developed alongside the main PARTHENOS Project website, and was designed and structured to allow for a scalable approach to the training materials and modules that PARTHENOS develops.

In order to meet the key needs of the user, the Training Suite has four main sections:
- Training Modules
- For Trainers
- For Learners
- About PARTHENOS Training

Training Modules

As the name suggests - this section is the main location for the training modules we have developed.

Each module is broken down into key sections, and in some cases, sub-sections. On each page there is a training video of a lecture delivered by an expert in the field. In some cases, shorter videos containing more 'bitesize' information are featured. Slides used in the training lecture videos are included via Slideshare, and where appropriate a 'further learning' dropdown list with links to useful training sites, bibliography details and videos from other sources is included at the end of each section.

This design allows each module to stand alone - and even each section to be accessible without having to complete the entire module.

For Trainers - The 'Train the Trainer' approach

While seeking to provide the learner with discrete learning opportunities, we also wanted to ensure that those delivering training within institutions were well furnished with the materials and means with which to do so. For this reason, many of the training materials used throughout the modules are easily accessible through other means, such as YouTube and SlideShare, as well as in a dedicated 'Training Materials' section of the Training Suite (http://training.parthenos-project.eu/for-trainers/). We have also provided sample course outlines to show how these materials might be used in a wider course setting. That said, there is no prescriptivism in this approach, allowing the trainers to make use of the materials as they see fit.

The training materials provide by PARTHENOS have been specifically created to sit comfortably alongside training materials from other sources, moreover it is our intent to enhance those sources and provide the trainer (and indeed learner) with more flexibility in their use.

For Learners

While brief, this section provides an outline for the rationale behind the training modules. As the Training Suite develops, this section will also grow, providing an 'executive summary' of sorts to show what modules are on offer.

About PARTHENOS Training

This final section, hosts information about the academics who provide the lectures, and course developers. There is also information on the background and development of the Training Suite, including the Initial Training Plan, as well as an opportunity for users to provide feedback via an online form. This further defines the Training Suite as an organic and 'living' learning-space.

Taking it further

Independent research infrastructures are becoming ever more a part of the humanities research ecosystem, and establishing themselves not just as places to support research, but where unique knowledge is being created, and unique methods and practices developed. They are also a place where many of our graduates may find their first employment, or indeed build their careers. For this reason, if for no other, the knowledge and experience infrastructures generate must be better communicated and shared. The development of a theoretical understanding of the strengths of the research infrastructure, what knowledge they contribute to digital humanities, and how this knowledge could be more systematically shared has been a primary goal of the training programme of the PARTHENOS cluster to date.

Looking toward the future, we must turn away from this 'pure' understanding of knowledge creation and sharing outside of existing formal education pathways, and seek to understand how the formal and the practical spheres can be integrated. In PARTHENOS, we are approaching this challenge in two ways: first, by working with university-based programmes to improve our understanding of where infrastructures feature in Higher Education programmes through desk research, surveys and course-provider workshops with colleagues already providing training in DH within the HE sector, what the term means, and how we might make our knowledge and skills available through these programmes. To a certain extent, we have already begun this, by reviewing existing DH Training in Third Level institutions across Europe. Secondly, and perhaps more radically, we are looking at the traditions within European

infrastructure projects of the 'Transnational Access Fellow,' as a proven model of how knowledge is shared in a practical and focussed context, applicable across research interests, disciplines, and career stages.

Each of these initiatives will represent a radical departure for the EU-funded humanities research infrastructures that participate in the PARTHENOS cluster. We are, after all, funded to be a support to the European research mission, not to the educational one. This dichotomy is, however, as we all know, both misleading and dangerous, for the productive synergies between high-quality research and high-quality teaching is well-documented. As we continue to reshape the metaphors and mentalities surrounding infrastructure, moving from synchrotrons and research databases to communities and rich augmented research spaces, it is imperative that we also find ways of giving access to our knowledge and practices to a new generation of DH scholars.

Acknowledgements

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