

Preparing Archaeologists for the Digital Present and Future

Curriculum Development and Teaching Experiences with ICT and Related Skills for Archaeology

ICT (Information and Communication Technology), digital, and spatial information skills are becoming ever more crucial in the practice and training of archaeologists. Today, almost every aspect of doing archaeology uses and produces digital data. The requirements of data management exceed proper long-term archiving of analogue and digital data. Today, expectations have shifted from final publications towards an open research process, that enables reproducible research through digital publishing of data and analysis procedures (Kansa and Kansa, 2021). This idea is not all that new: French polymath, archaeologist and computer scientist Jean-Claude Gardin developed databases for archaeological recording in the 1950s already and envisioned how the use of computers would improve the pursuit of Archaeology. He dreamed of archaeologists putting their data coded on punch cards in the library, so that everybody could do research with the data, instead of starting with the compiling of data anew for every single research project. At the same time, he was aware that the adoption of the new technology would be slow, hampered by the deeply internalized ways of doing archaeology: „Therefore, professional methods and habits will both have to be radically changed before computer science can be fully exploited so as to relieve archaeologists of the endlessly repetitive drudgery of compilation which at present takes up most of their time.“ (Gardin, 1971:198). It took even longer than he expected, and it is our generation that sees Gardin’s dream coming true. This process is enabled by the internet that allows the sharing and dissemination of data in an unprecedented way. This is not only true for the archaeological data itself, but also for the computational knowledge required for its processing, which is laid down and available in the form of open-source software. However, it requires some knowledge of the methods, terminology and conventions of computer science and its community to make use of these tools.

The digital workflow of archaeology is not at its end with data gathering and processing. Virtual reality enables the creation of vivid, detailed, and interactive representations of the past. These are not only mere depictions but have become proper research tools and a medium of scholarly discussion, documenting not only visions of the past but also the sources and processes of thought that led to their creation (Kuroczynski, 2017:457–458). Virtual models and their documentation become in turn share- and debatable digital data.

Archaeology is not only about the scholarly discourse about the material record of the past and the derived scientific data, but also about the creation, negotiation and adaptation of historical narratives. The way and by whom narratives are told and negotiated are revolutionized by digitization, too. Archaeologists have to engage with a public that is no longer content with passively consuming the archaeologists’ interpretation of the past in museums and books. Instead, people actively engage with the past. There are different ways to do this. Even the classical approaches to the presentation of archaeology - museum and books - are becoming more interactive and digital. Internet-enabled crowd-sourcing and citizen science invites to active participation in archaeological activities (e.g. Lin et al., 2014; Lambers et al., 2019; Wilkins, 2020). Such developments added new requirements to

the profession of archaeologists. They are becoming not only experts of the past, but creators and providers of digital data and related content.

All these things can't be handled as an extra in archaeological institutions and projects that is taken care of by the tech-savvy colleague in overtime hours. It needs thoroughly trained experts in archaeology, who at the same time master the fields of scientific data gathering and curation, processing and analysis, interpretation and narration in the digital environment.

There is a marked gap of these skills in the curricula of universities training archaeologists. This is not too surprising, as it cannot be expected that the mostly small institutes where archaeological curricula are being taught can cover all the necessary skills. This seems to be not only true for Germany and Central Europe, but for larger parts of the world. A (non-representative) survey among 308 applicants for a Summer School on Computer and Geoscience Applications in Archaeology has shown a significant demand for ICT-related training for archaeologists. Which falls in line with earlier surveys in Germany (Bentz and Wachter, 2014:108), indicating that professional development in ICT skills is most sought-after.

A new curriculum in Computer and Geoscience in Archaeology

It is in this situation, where the Universities of Applied Sciences can make an impact. They have the equipment and staff to train archaeologists in the methods and tools from fields like computer science, spatial information science and geoscience and enable their application in archaeology. By doing so, they can offer practically oriented curricula, which are complementary or even interlocked with those of the university institutes (see Meier, 2021).

In line with these considerations, a team of archaeologists, computer scientists and spatial information scientists has been developing a new masters course called "Computer and Geoscience in Archaeology" in close cooperation with partners from archaeology, such as the German Archaeological Institute. The project has been supported by funding of the German Academic Exchange Service from 2019 to 2023. The developed study programme is aimed at Bachelor graduates of archaeology, who want to develop a deep understanding and advanced practical skills in relevant methods and skills from these fields and their application in archaeology. The courses taught include more technically oriented topics such as geodesy, GIS, remote sensing, programming, photogrammetry and 3D documentation but also an introduction to digital archaeology that is dedicated to the reflection about the role of technology applications in the field, together with ethical considerations. Other courses such as computational archaeology and a project seminar for project-oriented study are intended to bring both subjects together.

The talk will present the developed curriculum and preliminary teaching experiences during summer schools and field schools, along with new survey data on the training requirements and barriers.

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